Regular Board Meeting Agenda

Tuesday, May 12, 2026 | 6:00 PM | District Office Board Room, 8176 N. Westover, Joseph City, AZ 86032

Items on the regular meeting agenda may be discussed in executive session related to employment matters, for the purpose of obtaining legal advice thereon or other matters pursuant to A.R.S. 38-431.03(A). The Governing Board may change the order of agenda items, pursuant to Governing Board Policy BEDB. The meeting room will be open to the public fifteen minutes prior to the beginning of the meeting.

1. **PUBLIC HEARING**

   1.A. **FY 2025-26 Budget Revision #3**
   Individuals may comment on the Budget Revision. A complete copy of the Revised Budget may be viewed at the Joseph City School District Office and online at https://meetings.boardbook.org/Public/Organization/894 in ACTION ITEMS section of this agenda.

2. **OPENING ITEMS**

   2.A. **Call to Order**

   2.B. **Roll Call**

   2.C. **Pledge of Allegiance**

   2.D. **Invocation**

3. **APPROVE AGENDA**

4. **APPROVE MINUTES**
March 27, 2026 Special Board Meeting
April 8, 2026 Special Board Meeting
April 14, 2026 Regular Board Meeting
April 17, 2026 Special Board Meeting
April 21, 2026 Special Board Meeting

Minutes of Special Board Meeting of the Governing Board
Joseph City Unified School District
District Office Board Room, 8176 N. Westover, Joseph City, AZ 86032
Friday, March 27, 2026

Members present
Eldon Larsen, President; Dayton Flake, Clerk; Karsten Flake, Cat Hansen, Lexi Nelson

Administrators
None

Others present
Dr. Jeff Smith, ASBA

1. OPENING ITEMS

1.A. Call to Order
Motion by Eldon Larsen to call the meeting to order.
Time: 9:30 a.m.

1.B. Roll Call

1.C. Pledge of Allegiance

1.D. Invocation

1.E. Adoption of Agenda
Motion by Eldon Larsen to approve the agenda as presented; second by Lexi Nelson.
Final Resolution: Motion passed.
Yes: Eldon Larsen, Dayton Flake, Karsten Flake, Cat Hansen, Lexi Nelson

2. EXECUTIVE SESSION
Motion by Eldon Larsen to enter into Executive Session pursuant to A.R.S. 38-431.03 (A) (1) for the purpose of assisting the Board to screen applications related to the position of District Superintendent.
Final Resolution: Motion passed.
Yes: Eldon Larsen, Dayton Flake, Karsten Flake, Cat Hansen, Lexi Nelson
Executive session convened at 9:34 a.m.

Reconvened in open session at 11:55 a.m.

3. ITEMS FOR DISCUSSION AND POSSIBLE ACTION

3.A. The Governing Board will discuss applicants screened for the position of District Superintendent, and may consider certain applicants to interview for the position.

3.B. Discussion and consideration of interview strategies, question content, and the first-round interview schedule for the applicants selected to interview for the position of District Superintendent on April 8, 2026 in coordination with the Arizona School Boards Association.

3.C. Discussion and possible action regarding directing Arizona School Boards Association to work with Joseph City Unified School District administration to organize a community meeting to introduce finalist(s) for the position of District Superintendent, tentatively scheduled for April 17, 2026.

3.D. The Governing Board will discuss and may consider interview strategies and question content for final round interviews with finalists for the position of District Superintendent tentatively scheduled for April 17, 2026.

4. ADJOURNMENT

Call to adjourn the meeting by Eldon Larsen; second by Dayton Flake
Final Resolution: Motion passes.
Yes: Eldon Larsen, Karsten Flake, Dayton Flake, Cat Hansen, Lexi Nelson
Time: 12:11 pm

APPROVED:

_____
Board Clerk or President

Minutes of Special Board Meeting of the Governing Board
Joseph City Unified School District
District Office Board Room, 8176 N. Westover, Joseph City, AZ 86032
Wednesday, April 8, 2026

Members present
Eldon Larsen, President; Dayton Flake, Clerk; Karsten Flake, Cat Hansen, Lexi Nelson

Administrators present
None

Others present
Dr. Jeff Smith, ASBA

1. OPENING ITEMS

1.A. Call to Order
Motion to call the meeting to order by Eldon Larsen
Time: 8:00 a.m.

1.B. Roll Call

1.C. Pledge of Allegiance

1.D. Invocation

1.E. Adoption of Agenda
Motion by Eldon Larsen to adopt the agenda as presented; second by Dayton Flake.
Final Resolution: Motion passed.
Yes: Eldon Larsen, Dayton Flake, Karsten Flake, Cat Hansen, Lexi Nelson

2. EXECUTIVE SESSION
Motion by Eldon Larsen to convene into Executive Session pursuant to A.R.S. 38-431.03(A)(1) to interview candidates for the position of district Superintendent.
Executive session convened at 8:03 a.m.

Reconvened into open session at 3:58 p.m.

3. ACTION ITEMS

3.A. The Governing Board may consider offering specific candidates the opportunity to participate in a final interview for the position of district Superintendent
Motion by Eldon Larsen to invite Kent Baldwin, Shannon Harvilla, and Eric Miller for second-round Interviews; second by Karsten Flake.
Final Resolution: Approved
Yes: Eldon Larsen, Dayton Flake, Karsten Flake, Cat Hansen, Lexi Nelson

3.B. The Governing Board may consider a tentative schedule and interview outline for specific candidates participating in the district Superintendent final interview round

4. ADJOURNMENT
Motion by Eldon Larsen to adjourn the meeting; second by Dayton Flake

Final Resolution: Motion passed.
Yes: Eldon Larsen, Dayton Flake, Karsten Flake, Cat Hansen, Lexi Nelson
Meeting adjourned at 3:59 p.m.

APPROVED:

_____
Board Clerk or President

Minutes of Regular Board Meeting of the Governing Board
Joseph City Unified School District
District Office Board Room, 8176 N. Westover, Joseph City, AZ 86032
Tuesday, April 14, 2026

Members present
Eldon Larsen, President; Dayton Flake, Clerk; Karsten Flake, Cat Hansen, Lexi Nelson

Administrators present
Bryan Fields, Superintendent; Steven Mills, Business Manager; Eric Miller, JH/HS Principal; Darrel Mosier, Elementary Principal

Others present
JCHS Girls Basketball Team, 15 community members

1. OPENING ITEMS

1.A. Call to Order
Motion by Eldon Larsen to call the meeting to order.
Time: 6:00 p.m.

1.B. Roll Call

1.C. Pledge of Allegiance

1.D. Invocation

2. APPROVE AGENDA
Motion by Eldon Larsen to approve the agenda as presented; second by Lexi Nelson
Final Resolution: Motion passed.
Yes: Eldon Larsen, Dayton Flake, Karsten Flake, Cat Hansen, Lexi Nelson

3. APPROVE MINUTES
Motion to approve the March 10, 2026 Regular Board Meeting minutes by Dayton Flake; second by Lexi Nelson.
Final Resolution: Motion passed.
Yes: Eldon Larsen, Dayton Flake, Karsten Flake, Cat Hansen, Lexi Nelson

4. SUPERINTENDENT'S REPORT
Jess Bushman reported on EAC STEM Day Scholarship awards to JCHS Students.
JCHS Girls Basketball State Championship Team was honored.
Mr. Fields presented current events and updates for the governing board.

5. REQUESTS TO SPEAK TO THE GOVERNING BOARD
Danny Hutchens addressed the board regarding the Superintendent selection process.

6. CONSENT AGENDA
Motion by Eldon Larsen to approve the Consent Agenda; second by Lexi Nelson
Final Resolution: Motion passed.
Yes: Eldon Larsen, Dayton Flake, Karsten Flake, Cat Hansen, Lexi Nelson

6.A. Approve Expense Vouchers
Action to ratify district vouchers for the period 3/1/2026 through 3/31/2026.
General and Special Funds: #20 $167,200.77; #21 $149,084.02; #1030 $21,313.49; #1031 $44,648.23; #1032

$65,819.97; #1033 $110,444.88; #1034 $121,309.43
Auxiliary Operations Funds: #1056 $8,569.00; #1058 $3,624.20; #1061 $4,180.72; #1063 $2,955.59; #1065 $1,674.81
Student Activities Fund: #1057 $1,474.05; #1059 $2,313.77; #1062 $1.474.41; #1066 $1,406.79

6.B. Student Activities Fund Report
Revenues, expenditures and charges in the Student Activities Fund Report; period of 3/1/2026 through 3/31/2026.

6.C. Gifts & Donations
:

Donor	Item	School/Program	Purpose	Amount
Donors Choose	Weight Room Equipment	Jr/Sr High Weights	Help student effectiveness and efficiency in their workouts	$2,078.33
EDP	Donation	Jr/Sr High School FFA/ AG	Support the Program	$2,000

6.D. Student Fundraisers

Organization	Description	Action
Class of 2027	Prom	Ratify
JH Student Council	Sucker Sales	Ratify

6.E. Approval Renewal of Navajo County Special Services Consortium Intergovernmental Agreement for 2026-27

6.F. Approve Renewal of Intergovernmental Agreement with Northern Arizona Vocational Institute of Technology (NAVIT)
Provide career, technical and vocational instructional programs for JCUSD students

7. POSSIBLE EXECUTIVE SESSION
None

8. ACTION ITEMS

8.A. Personnel Requests

Name	Assignment	Action
Bushman, Dan	Counselor	Renewal
Hancock, Natalie	Speech Language Pathologist	Renewal
Metzger, Kelly	Red Ribbon Coordinator, Elementary	Renewal
Roes, Martin	HS Head Football Coach	Renewal

Motion by Eldon Larsen to approve the personnel requests as presented; second by Karsten Flake.
Final Resolution: Motion passes.
Yes: Eldon Larsen, Karsten Flake, Dayton Flake, Cat Hansen, Lexi Nelson

8.B. Employee Request to Retire with the Intention to Return to Work as Contracted Staff for FY 2026-27
Retirement effective June 30, 2025; Return to work as contracted staff through Educational Services LLC (ESI) effective July 1, 2026:

- Ruth Hansen (Teacher/Title I Reading Specialist)

Motion by Eldon Larsen to approve Ruth Hansen's request to retire with the intention to return to work as contracted staff for FY 2026-27; second by Dayton Flake.
Final Resolution: Motion passes.
Yes: Eldon Larsen, Karsten Flake, Dayton Flake, Cat Hansen, Lexi Nelson

8.C. Approve Employee Benefits and Health Insurance Agreements for 2026-27

Motion to approve Employee Benefits and Health Insurance Agreements for 2026-27 as presented.
Final Resolution: Motion passes.
Yes: Eldon Larsen, Karsten Flake, Dayton Flake, Cat Hansen, Lexi Nelson

8.D. Approve Renewal of Contract with Southwest Foodservice for FY 2026-27
Motion to Approve Renewal of Contract with Southwest Foodservice for FY 2026-27
Final Resolution: Motion passes.
Yes: Eldon Larsen, Karsten Flake, Dayton Flake, Cat Hansen, Lexi Nelson

8.E. Discussion and Possible Approval of Changes to Meal Prices and Food Service Breakfast Programs
Motion by Eldon Larsen to approve the recommended price increases as presented; second by Lexi Nelson.
Final Resolution: Motion passes.
Yes: Eldon Larsen, Karsten Flake, Dayton Flake, Cat Hansen, Lexi Nelson

8.F. Accept the Joseph City Unified School District Financial Audit Report for the Fiscal Year ended June 30, 2025
Motion by Eldon Larsen to Accept the Joseph City Unified School District Financial Audit Report for the Fiscal Year ended June 30, 2025; second by Cat Hansen.
Final Resolution: Motion passes.
Yes: Eldon Larsen, Karsten Flake, Dayton Flake, Cat Hansen, Lexi Nelson

1. INFORMATION ITEMS

1.A. First Reading of Corrections to Policy IE
This policy concerns Organization of Instruction

1.B. Review of Possible Policy Changes to be Considered for Adoption at a Future Meeting
See the attached Policy Advisory for policy changes to be considered. See the Link section of this agenda item to view the current policy manual. No policy changes will be adopted at this meeting. Multiple policies are included in this reading.

1.C. Requests for Future Agenda Items
None

1.D. Upcoming Meetings and Events Calendar
Motion by Karsten Flake to add a Special Meeting on April 21, 2026 at 6:00 p.m. for possible discussion and personnel actions prior to May's regular board meeting; second by Karsten Flake.
Final Resolution: Motion passes.
Yes: Eldon Larsen, Karsten Flake, Dayton Flake, Cat Hansen, Lexi Nelson

- Final Round and Community Forum to Meet and Greet the Superintendent Candidates - April 17, 2026; 1:30 p.m. to 8:00 p.m. (Board Room)
- Special Meeting – April 21, 2026; 6:00 p.m.
- Next Regular Board Meeting - May 12, 2026; 6:00 p.m.
- Kindergarten Promotion - May 19, 2026; 6:00 p.m. (HS Auditorium)
- 8th Grade Promotion - May 20, 2026; 7:00 p.m. (HS Auditorium)
- High School Graduation - May 21, 7:00 p.m. (HS Auditorium)

2. ADJOURNMENT
Motion to adjourn by Eldon Larsen; second by
Final Resolution: Motion passes.
Yes: Eldon Larsen, Karsten Flake, Dayton Flake, Cat Hansen, Lexi Nelson
Time: 7:27 p.m.

APPROVED:

_____
Board Clerk or President

Minutes of Special Board Meeting of the Governing Board
Joseph City Unified School District
District Office Board Room, 8176 N. Westover, Joseph City, AZ 86032
Friday, April 17, 2026

Members present
Eldon Larsen, President; Dayton Flake, Clerk; Karsten Flake, Cat Hansen, Lexi Nelson

Administrators present
None

Others present
Dr. Jeff Smith, ASBA

1. OPENING ITEMS

1.A. Call to Order
Eldon Larsen called the meeting to order.
Time: 1:30 p.m.

1.B. Roll Call

1.C. Pledge of Allegiance

1.D. Invocation

1.E. Adoption of Agenda
Motion by Eldon Larsen to approve the agenda as presented; second by Dayton Flake
Final Resolution: Motion passed
Yes: Eldon Larsen, Dayton Flake, Karsten Flake, Cat Hansen, Lexi Nelson

2. PANEL ORIENTATION FOR SUPERINTENDENT FINALIST INTERVIEWS

3. EXECUTIVE SESSION
Motion by Eldon Larsen to convene an Executive Session pursuant to A.R.S. 38-431.03(A)(1) to conduct second interviews of candidates for the position of district Superintendent; Second by Karsten Flake
Final Resolution: Motion passed
Yes: Eldon Larsen, Dayton Flake, Karsten Flake, Cat Hansen, Lexi Nelson
Time: 1:39 p.m.

Executive Session ended at 4:34 p.m. to reconvene at the Jr/Sr High School Auditorium.

4. RECONVENE AT JOSEPH CITY JR/SR HIGH SCHOOL AUDITORIUM FOR COMMUNITY MEETING
Board members reconvened in open session at 5:00 p.m. in the B.G. Bennett Auditorium located at 4629 East 2nd North, Joseph City, AZ 86032, where the community had an opportunity to meet the superintendent finalists and ask questions.

5. RECONVENE EXECUTIVE SESSION AT DISTRICT OFFICE BOARD ROOM
At the conclusion the Community Meeting the Governing Board reconvened the meeting at the District Office Board Room.
Motion by Eldon Larsen to reconvene into Executive Session pursuant to A.R.S. 38-431.03(A)(1) to discuss candidates for the position of district Superintendent; Second by Karsten Flake

Final Resolution: Motion passed
Yes: Eldon Larsen, Dayton Flake, Karsten Flake, Cat Hansen, Lexi Nelson
Time: 6:41 p.m.

Reconvened in open session at 7:04 p.m.

6. DISCUSSION AND POSSIBLE ACTION TO AUTHORIZE CONTRACT NEGOTIATIONS WITH SUPERINTENDENT CANDIDATE

Motion to enter into contract negotiations with Superintendent Candidate, Shannon Harvilla by Eldon Larsen; second by Karsten Flake.
Final Resolution: Motion passed
Yes: Eldon Larsen, Dayton Flake, Karsten Flake, Cat Hansen, Lexi Nelson

7. ADJOURNMENT

Call to adjourn the meeting by Eldon Larsen; second by Lexi Nelson
Final Resolution: Motion passed.
Yes: Eldon Larsen, Dayton Flake, Karsten Flake, Cat Hansen, Lexi Nelson
Time: 7:09 p.m.

APPROVED:

_____
Board Clerk or President

Minutes of Special Board Meeting of the Governing Board
Joseph City Unified School District
District Office Board Room, 8176 N. Westover, Joseph City, AZ 86032
Tuesday, April 21, 2026

Members present
Eldon Larsen, President; Dayton Flake, Clerk; Karsten Flake, Cat Hansen, Lexi Nelson

Administrators present
Bryan Fields, Superintendent; Steven Mills, Business Manager; Eric Miller, JH/HS Principal; Darrel Mosier, Elementary Principal

Others present
10 community members

1. OPENING ITEMS

1.A. Call to Order
Motion by Eldon Larsen to call the meeting to order.
Time: 6:00 p.m.

1.B. Roll Call

1.C. Pledge of Allegiance

1.D. Invocation

1.E. Adoption of Agenda
Motion by Eldon Larsen to adopt the agenda with deletion of Kylee Morris on the personnel requests and combining items 3C through 3F into one action; second by Dayton Flake.
Final Resolution: Motion passed.
Yes: Eldon Larsen, Dayton Flake, Karsten Flake, Cat Hansen, Lexi Nelson

1.F. Superintendent's Report

1.G. Call to the Public
Kay Rush addressed the Governing Board regarding budget issues.

2. EXECUTIVE SESSION
For any agenda item indicated with an asterisk (*), the Board may vote to convene in Executive Session pursuant to A.R.S. 38-431.03 (A) (1) for personnel matters when notified; (2) discussion or consideration of records exempt by law from public inspection; (3) for consultation with attorney; (4) for consultation with attorney when in pending or contemplated litigation. Discussion or consideration of personnel matters may include employment, assignment, appointment, promotion, demotion, dismissal, salaries, disciplining or resignation of a public officer, appointee or employee.

3. ACTION ITEMS

3.A. Personnel Requests

Name	Assignment	Action
Barner, Rebecca	Speech Language Pathologist Assistant	Resignation

Name	Assignment	Action
Combs, Darcy	Instructional Aide	Resignation
Hancock, Roland	Teacher	Resignation
Hutchens, Brenlee	Instructional Aide	Resignation
Johnstun, Anna	Seasonal Worker	Renewal
Miller, Ava	Instructional Aide - Title I	Resignation
~~Morris, Kylee~~ (removed)	~~Instructional Aide~~	~~Resignation~~
Sander, Amanda	Teacher 2nd Grade	Resignation

Motion by Eldon Larsen to approve the personnel requests as presented; second by Cat Hansen.
Final Resolution: Motion passes.
Yes: Eldon Larsen, Karsten Flake, Dayton Flake, Cat Hansen, Lexi Nelson

3.B. Discussion and possible action for termination of Library Aide, Lisa Gayer

Motion by Eldon Larsen to terminate the employment of At-Will-Employee, Lisa Gayer; second by Lexi Nelson.
Final Resolution: Motion passes.
Yes: Eldon Larsen, Dayton Flake, Cat Hansen, Lexi Nelson
Abstained: Karsten Flake

3.C. Discussion and possible action for the non-renewal of Campus Aide, Hailey Ashcroft

3.D. Discussion and possible action for the non-renewal of Instructional Aide, Sharnell Chairez

3.E. Discussion and possible action for the non-renewal of Instructional Aide, Katherine Frost

3.F. Discussion and possible action for the non-renewal of Bus Driver, Joseph Watkins

Motion to approve items 3C through 3F by Eldon Larsen; second by Cat Hansen
Final Resolution: Motion passes
Yes: Eldon Larsen, Dayton Flake, Karsten Flake, Cat Hansen, Lexi Nelson

3.G. (*) Discussion and possible action regarding contract negotiations with Superintendent candidate

Motion to enter into Executive Session per A.R.S. 38-431.03(A)(1) by Eldon Larsen; second by Karsten Flake.
Final Resolution: Motion passes
Yes: Eldon Larsen, Dayton Flake, Karsten Flake, Cat Hansen, Lexi Nelson
Time: 6:12 p.m.

Reconvene into Regular Session: 6:37 p.m.

4. ADJOURNMENT

Motion to adjourn the meeting by Eldon Larsen; second by Dayton Flake
Final Resolution: Motion passes
Yes: Eldon Larsen, Dayton Flake, Karsten Flake, Cat Hansen, Lexi Nelson
Time: 6:38 p.m.

APPROVED:

_____
Board Clerk or President

5. **SUPERINTENDENT'S REPORT**

BYLAWS OF PARENTS SUPPORTING WILDCATS (PSW)

Article I: Name

The name of this organization shall be Parents Supporting Wildcats (PSW).

Article II: Purpose

This organization is organized exclusively for charitable and educational purposes within the meaning of Section 501(c)(3) of the Internal Revenue Code. The purpose of PSW is to enhance and support the educational experience of students in the Joseph City Unified School District, to develop a closer connection between school and home, and to improve the school environment through volunteer and financial support.

Article III: Membership

Section 1: Eligibility
Membership is open to parents, guardians, family members of students, and all faculty and staff.

Section 2: Dues
Dues, if any, shall be determined annually by the Executive Board.

Section 3: Voting
Each member in good standing is entitled to one vote. Proxy voting is not permitted.

Article IV: Officers and Executive Board

Section 1: Officers
The officers shall include President, Vice President, Secretary, and Treasurer.

Section 2: Duties

- President: Oversees meetings and operations
- Vice President: Assists President and oversees committees
- Secretary: Maintains records and meeting minutes
- Treasurer: Manages finances and reports

Section 3: Terms
Officers serve one-year terms and may be re-elected.

Section 4: Elections
Elections shall be held annually by majority vote.

Article V: Meetings

Section 1: General Meetings
At least four meetings per year.

Section 2: Special Meetings
May be called with 48 hours' notice.

Section 3: Quorum
Members present constitute a quorum.

Article VI: Finances

Section 1: Fiscal Year
July 1 – June 30

Section 2: Budget
Approved annually by membership.

Section 3: Expenditures
Must align with budget or be approved.

Section 4: Financial Review
Annual review by non-board member.

Section 5: Banking
Two authorized signatures required on checks.

Article VII: Committees

Committees may be formed as needed and approved by the Board.

Article VIII: Parliamentary Authority

Robert’s Rules of Order Newly Revised governs proceedings.

Article IX: Amendments

Amendments require a two-thirds vote with prior notice.

Article X: Conflict of Interest

The organization shall adopt and maintain a conflict of interest policy.

Article XI: Non-Discrimination

The organization shall not discriminate based on race, religion, gender, or background.

Article XII: IRS Compliance

Section 1: Private Benefit
No part of the net earnings shall benefit any private individual.

Section 2: Political Activity
The organization shall not participate in political campaigns.

Section 3: Lobbying
No substantial lobbying shall be conducted.

Article XIII: Dissolution

Upon dissolution, assets shall be distributed to one or more qualifying 501(c)(3) organizations or a government entity for public educational purposes.

Summary of Budget Reductions for FY27

Elimination of Teaching Positions:	$94,000+
Elimination of Classified Positions:	$200,000
Elimination of One Bus Route:	$50,000
Reduction in Summer Employment:	$15,000
Counseling Reductions:	$40,000
Food Service Reductions/Savings:	$20,000
Technology Department:	$20,000
Total:	**$435,000**

Additional Possible Expenses:

New Superintendent

Special Education Director

Federal Projects and Grants Management

6. **REQUESTS TO SPEAK TO THE GOVERNING BOARD**

The procedure for addressing the Board in a public meeting may be viewed here: https://josephcityaz.sites.thrillshare.com/page/public-comments

7. **CONSENT AGENDA**

Vote on Consent Agenda. All items listed will be considered as a group and will be approved with one motion unless a Board Member requests an item be removed from the consent agenda and considered as a separate item.

7.A. **Approve Expense Vouchers**

Action to ratify district vouchers for the period 4/1/2026 through 4/30/2026.
General and Special Funds: #22 $164,299.66; #23 $161,649.88; #1035 $23,545.12; #1036 $6,317.02; #1037 $63,757.72; #1038 $72,960.18
Auxiliary Operations Funds: #1068 $15,648.30; #1071 $800.00; #1072 $1,401.78; #1075 $1,083.00; #1077 $200.00
Student Activities Fund: #1070 $220.00; #1073 $2,150.03; #1076 $1,1260.00

7.B. **Student Activities Fund Report**

Revenues, expenditures and charges in the Student Activities Fund Report; period of 4/1/2026 through 4/30/2026.

JOSEPH CITY USD EXTERNAL FUNDS

Student Activities Summary Report

Fiscal Year: 2025 - 2026

From Date: 4/1/2026 **To Date:** 4/30/2026

☐ Print Detail ☐ Page Break by Activity ☐ Subtotal By Journal

☐ Exclude Encumbrances ☑ Reverse Sign

		Range Beg. Balance	Range Revenue	Range Expenditures	Balance	Encumbrance	Available Balance
000000	Undesignated DO NOT USE	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
102610	Joseph City Jr High School Student Council	$144.65	$181.00	$0.00	$325.65	($324.19)	$1.46
102612	Joseph City Jr High School Softball	($11.39)	$0.00	$0.00	($11.39)	$0.00	($11.39)
102619	Joseph City Jr High School Volleyball	$507.27	$0.00	$0.00	$507.27	$0.00	$507.27
102629	Joseph City Jr High School Track	$260.11	$0.00	$0.00	$260.11	$0.00	$260.11
102637	Joseph City Jr High School Class of 2024	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
102638	Joseph City Jr High School Class of 2025	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
102639	Joseph City Jr High School Class of 2026	$4,760.06	$0.00	$0.00	$4,760.06	$0.00	$4,760.06
102640	Joseph City Jr High School Class of 2027	$1,657.52	$0.00	$0.00	$1,657.52	$0.00	$1,657.52
102641	Joseph City Jr High School Class of 2028	$757.40	$0.00	$0.00	$757.40	$0.00	$757.40
102642	Joseph City Jr High School Class of 2029	$1,134.04	$0.00	$0.00	$1,134.04	$0.00	$1,134.04
102643	Joseph City Jr High School Class of 2030	$594.61	$0.00	$0.00	$594.61	$0.00	$594.61
102644	Joseph City Jr High School Class of 2031	$1,259.49	$0.00	$0.00	$1,259.49	$0.00	$1,259.49
102645	Joseph City Jr High School Class of 2032	$95.40	$0.00	$0.00	$95.40	$0.00	$95.40
102646	Joseph City Jr High School Class of 2033	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
203601	Joseph City High School Band	$218.26	$0.00	$0.00	$218.26	$0.00	$218.26
203602	Joseph City High School Baseball	$5,546.94	$60.00	$0.00	$5,606.94	($2,863.84)	$2,743.10
203603	Joseph City High School Art	$19.00	$0.00	$0.00	$19.00	$0.00	$19.00
203604	Joseph City High School Disc Golf Club	$919.02	$0.00	$0.00	$919.02	$0.00	$919.02
203605	Joseph City High School Chess Club	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
203606	Joseph City High School Card and Game Club	$146.14	$0.00	$0.00	$146.14	$0.00	$146.14
203607	Joseph City High School Drama	$780.11	$0.00	($310.00)	$470.11	$310.00	$780.11
203608	Joseph City High School Future Business Leaders of America	$192.53	$0.00	$0.00	$192.53	$0.00	$192.53
203609	Joseph City High School Girls Basketball	$1,149.95	$1,000.00	($1,000.00)	$1,149.95	$0.00	$1,149.95
203610	Joseph City High School Student Council	$4,893.13	$0.00	($1,840.03)	$3,053.10	$1,761.29	$4,814.39
203611	Joseph City High School National Honor Society	$482.97	$0.00	$0.00	$482.97	$0.00	$482.97
203612	Joseph City High School Softball	$2,041.37	$0.00	$0.00	$2,041.37	$0.00	$2,041.37
203613	Joseph City High School Momentum Club/Audition Choir	$2,709.15	$0.00	($160.00)	$2,549.15	$0.00	$2,549.15
203614	Joseph City High School Wrestling	$4,234.15	$0.00	$0.00	$4,234.15	$0.00	$4,234.15
203615	Joseph City High School Cheerleaders	$789.06	$0.00	$0.00	$789.06	$0.00	$789.06
203616	Joseph City High School Welding	$136.33	$0.00	$0.00	$136.33	$0.00	$136.33
203617	Joseph City High School Woods	$104.72	$0.00	$0.00	$104.72	$0.00	$104.72
203618	Joseph City High School Boys Basketball	$1,339.85	$0.00	$0.00	$1,339.85	$0.00	$1,339.85
203619	Joseph City High School Volleyball	$7,865.52	$0.00	$0.00	$7,865.52	$0.00	$7,865.52
203620	Joseph City High School FACS	$35.74	$0.00	$0.00	$35.74	$0.00	$35.74
203621	Joseph City High School Hotrod Club	($201.63)	$0.00	$0.00	($201.63)	$0.00	($201.63)
203622	Joseph City High School LACH Club	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
203624	Joseph City High School Basketball Cheerleaders	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
203625	Joseph City High School FFA	$583.36	$2,000.00	$0.00	$2,583.36	($900.00)	$1,683.36
203626	Joseph City High School Happy Club	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
203627	Joseph City High School Robotics	$359.85	$0.00	$0.00	$359.85	$0.00	$359.85
203628	Joseph City High School Cross Country	$370.60	$0.00	$0.00	$370.60	$0.00	$370.60
203629	Joseph City High School Track	$321.04	$0.00	$0.00	$321.04	$0.00	$321.04

Student Activities Summary Report

Fiscal Year: 2025 - 2026

From Date: 4/1/2026 **To Date:** 4/30/2026

☐ Print Detail ☐ Page Break by Activity ☐ Subtotal By Journal
☐ Exclude Encumbrances ☑ Reverse Sign

		Range Beg. Balance	Range Revenue	Range Expenditures	Balance	Encumbrance	Available Balance
203630	Joseph City High School Football	($65.42)	$0.00	$0.00	($65.42)	$0.00	($65.42)
203631	Joseph City High School Technology Club	$109.95	$0.00	$0.00	$109.95	$0.00	$109.95
203632	Joseph City High School Class of 2019	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
203633	Joseph City High School Class of 2020	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
203634	Joseph City High School Class of 2021	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
203635	Joseph City High School Class of 2022	$137.03	$0.00	$0.00	$137.03	$0.00	$137.03
203636	Joseph City High School Class of 2023	$780.48	$0.00	$0.00	$780.48	$0.00	$780.48
203637	Joseph City High School Class of 2024	$200.00	$0.00	$0.00	$200.00	$0.00	$200.00
203638	Joseph City High School Class of 2025	$388.42	($220.00)	$0.00	$168.42	$220.00	$388.42
203639	Joseph City High School Class of 2026	$344.22	$0.00	$0.00	$344.22	($1,202.00)	($857.78)
203640	Joseph City High School Class of 2027	$622.00	$1,285.00	$0.00	$1,907.00	($276.39)	$1,630.61
203641	Joseph City High School Class of 2028	$217.30	$0.00	$0.00	$217.30	$0.00	$217.30
203642	Joseph City High School Class of 2029	$57.77	$186.00	$0.00	$243.77	($200.00)	$43.77
500300	Districtwide UNDESIGNATED	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
500600	Districtwide UNDESIGNATED	($41.84)	$0.00	$0.00	($41.84)	$0.00	($41.84)
	Grand Total:	$48,946.23	$4,492.00	($3,310.03)	$50,128.20	($3,475.13)	$46,653.07

End of Report

7.C. **Student Fundraisers**

Organization	Description	Action
Class of 2028	Pulled Pork Sandwich Dinner	Ratify
Class of 2029	Navajo Taco Dinner	Ratify
HS Wrestling	Host a wrestling Camp	Approve

8. **POSSIBLE EXECUTIVE SESSION (*)**

For any agenda item indicated with an asterisk (*), the Board may vote to convene in Executive Session pursuant to A.R.S. 38-431.03 (A) (1) for personnel matters when notified; (2) discussion or consideration of records exempt by law from public inspection; (3) for consultation with attorney; (4) for consultation with attorney when in pending or contemplated litigation. Discussion or consideration of personnel matters may include employment, assignment, appointment, promotion, demotion, dismissal, salaries, disciplining or resignation of a public officer, appointee or employee.

9. **ACTION ITEMS**

9.A. **Personnel Requests (*)**

Name	Assignment	Action
See attached list	Support Staff, Management Team, Classified Specialist, Selected Extra Duty	2026-27 Renewals
Fields, Julie	Grant Coordinator	Resignation
Fischer, Brad	Summer Weightroom Coordinator	Renewal
Mills, Shelley	School Nurse	Resignation
Mills, Steven	Business Manager	Resignation
Morris, Kylee	Instructional Aide	Resignation
Morris, Patrick	Bus Driver	Resignation
Mosier, Darrel	Elementary School Principal	Resignation
Rush, Kay	JH Student Council Advisor	Resignation

Employment Renewals
2026-27

Name	Position
BUCKLEY, SHEALYN	Instructional Aide
BUCKLEY, SHEALYN	Lead Cashier
BUCKLEY, SHEALYN	School Secretary
BUSHMAN, ADRIANE	School Secretary
BUSHMAN, JACOB	Instructional Aide
CASE, EMILY	Instructional Aide
CASE, GREG	Instructional Aide
COLLIGON, DREW	Instructional Aide
COMBS, DARCY	Instructional Aide (renew through 8/31/26)
DESHAZOR, STEVEN	Bus Driver
DIXON, TYRA	Instructional Aide
FARNES, MITCHELL	Technology Specialist
GARDNER, JASON	Technology Coordinator
GOLDING, TORI	Instructional Aide
HANSEN, MARIJOE	FFA Sponsor
HARDY, DESIREE	Instructional Aide
HARDY, REDIC	Bus Driver
HAYES, SARAH	Instructional Aide
HUTCHENS, DANIEL III	Mechanic/Transportation
HUTCHENS, DANIEL JR	Band Director
HUTCHENS, DANIEL JR	Choral Director
JENSEN, LOUCINDA	Custodian
JENSEN, MARY	Custodian
JOHNSTUN, DANA	Receiving Clerk
JOHNSTUN, SPENCER	Transportation Coordinator
KEAMS, MARGARET	NAVIT Driver
KINLICHEENIE, TAWNYA	Instructional Assistant
MILLER, ERIC	Principal
MILLS, JULIE	Technology & Data Specialist
MOSIER, JORI	Special Education Secretary
MURPHY, TYLER	Activities Director
NEAL, BRAD	Maintenance Coordinator
NEAL, CONNER	Maintenancer Tech
NELLS, SELENA	Finance Specialist
NELLS, SELENA	Indian Education Coordinator
NELLS, SELENA	Wellness Coordinator
RANDALL, JULIE	Instructional Aide / NAVIT
RANDALL, JULIE	Instructional Specialist
RANDALL, JULIE	Yearbook Advisor
RICE, LISA	Finance Specialist
ROGERS, KELLY	Custodian
SOLOMON, RHONA	School Secretary
STRONG, JULIE	Superintendent/Board Secretary
TAVESI, KIKA	Instructional Aide
WESTOVER, JENNIFER	School Secretary
YOUNG, CLAIRE	Instructional Aide

9.B. **Consideration and Possible Action to Recognize and Establish a Cooperative Relationship with the Parents Supporting Wildcats (PSW) Organization**

The PSW Organization is an independent 501(c)(3) nonprofit organization formed to support the students, programs, activities, and mission of Joseph City Unified School District.

BYLAWS OF PARENTS SUPPORTING WILDCATS (PSW)

Article I: Name

The name of this organization shall be Parents Supporting Wildcats (PSW).

Article II: Purpose

This organization is organized exclusively for charitable and educational purposes within the meaning of Section 501(c)(3) of the Internal Revenue Code. The purpose of PSW is to enhance and support the educational experience of students in the Joseph City Unified School District, to develop a closer connection between school and home, and to improve the school environment through volunteer and financial support.

Article III: Membership

Section 1: Eligibility
Membership is open to parents, guardians, family members of students, and all faculty and staff.

Section 2: Dues
Dues, if any, shall be determined annually by the Executive Board.

Section 3: Voting
Each member in good standing is entitled to one vote. Proxy voting is not permitted.

Article IV: Officers and Executive Board

Section 1: Officers
The officers shall include President, Vice President, Secretary, and Treasurer.

Section 2: Duties

- President: Oversees meetings and operations
- Vice President: Assists President and oversees committees
- Secretary: Maintains records and meeting minutes
- Treasurer: Manages finances and reports

Section 3: Terms
Officers serve one-year terms and may be re-elected.

Section 4: Elections
Elections shall be held annually by majority vote.

Article V: Meetings

Section 1: General Meetings
At least four meetings per year.

Section 2: Special Meetings
May be called with 48 hours' notice.

Section 3: Quorum
Members present constitute a quorum.

Article VI: Finances

Section 1: Fiscal Year
July 1 – June 30

Section 2: Budget
Approved annually by membership.

Section 3: Expenditures
Must align with budget or be approved.

Section 4: Financial Review
Annual review by non-board member.

Section 5: Banking
Two authorized signatures required on checks.

Article VII: Committees

Committees may be formed as needed and approved by the Board.

Article VIII: Parliamentary Authority

Robert’s Rules of Order Newly Revised governs proceedings.

Article IX: Amendments

Amendments require a two-thirds vote with prior notice.

Article X: Conflict of Interest

The organization shall adopt and maintain a conflict of interest policy.

Article XI: Non-Discrimination

The organization shall not discriminate based on race, religion, gender, or background.

Article XII: IRS Compliance

Section 1: Private Benefit
No part of the net earnings shall benefit any private individual.

Section 2: Political Activity
The organization shall not participate in political campaigns.

Section 3: Lobbying
No substantial lobbying shall be conducted.

Article XIII: Dissolution

Upon dissolution, assets shall be distributed to one or more qualifying 501(c)(3) organizations or a government entity for public educational purposes.

9.C. **Discussion and Approval of Policy Advisories 961–963; 965-1046, and Policy Revision IE.**
Approval of the above-mentioned ASBA recommended Policy Advisories, and JCUSD Policy IE.

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POLICY SERVICES *ADVISORY*

Volume 38, Number 2 **April 2026**

Policy Advisory No. 961 .....***DELETED*** Policy GA — Personal Goals / Priority Objectives

Policy Advisory No. 962 ..... Policy GB — General Personnel Policies

Policy Advisory No. 963 ..... Policy GBA — Equal Employment Opportunity
Regulation GBA-R — Equal Employment Opportunity
Exhibit GBA-E — Equal Employment Opportunity

Policy Advisory No. 964 ..... Policy GBAC — Indian Preference in Employment

Policy Advisory No. 965 ..... ***DELETED*** Policy GBB — Staff Involvement in Decision Making

Policy Advisory No. 966 .....Policy GBEA — Staff Ethics
NEW Regulation GBEA-R Ethics and Code of Conduct
NEW Exhibit GBEA-E Ethics and Code of Conduct

Policy Advisory No. 967 .....Policy GBEAA — Staff Conflict of Interest
Exhibit GBEAA-E — Staff Conflict of Interest

Policy Advisory No. 968 .....***DELETED*** Policy GBEB — Staff Conduct
DELETED Regulation GBEB-R — Staff Conduct
DELETED Exhibit GBEB-E — Staff Conduct

Policy Advisory No. 969 .....Policy GBEBB — Staff Conduct with Students

Policy Advisory No. 970 .....Policy GBEBC — Gifts to and Solicitations by Staff Members

Policy Advisory No. 971 .....Policy GBEC — Drug - Free Workplace
NEW Regulation GBEC-R — Drug - Free Workplace
Exhibit GBEC-EA — Drug - Free Workplace
DELETED Exhibit GBEC-EB — Drug - Free Workplace

Policy Advisory No. 972 ..... ***DELETED*** Policy GBECA — Nonmedical Use or Abuse of Drugs or Alcohol

Policy Advisory No. 973 ***DELETED*** Policy GBECB — Alcohol Use by Staff Members

Note: This material is written for informational purposes only, and not as legal advice. You may wish to consult an attorney for further explanation.

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Policy Advisory No. 974 ..... Policy GBED — Smoking by Staff Members

Policy Advisory No. 975 .....Policy GBEF — Staff Use of Digital Communications and Electronic Devices

Policy Advisory No. 976 ...***DELETED*** Policy GBEFA — Staff Use of Digital Wireless Communications or Electronic Devices While Operating a Motor Vehicle

Policy Advisory No. 977 .....***NEW*** Policy GBGA — Health
NEW Regulation GBGA-RA — Health
NEW Regulation GBGA-RB —Health
NEW Exhibit GBGA-EA — Health
NEW Exhibit GBGA-EB — Health

Policy Advisory No. 978 ..... ***DELETED*** Policy GBGB — Staff Personal Security and Safety
DELETED Regulation GBGB-R — Staff Personal Security and Safety

Policy Advisory No. 979 ..... ***DELETED*** Policy GBGC — Employee Assistance
DELETED Exhibit GBGC-E — Employee Assistance

Policy Advisory No. 980 ..... ***DELETED*** Policy GBGCA — Wellness Programs
DELETED Regulation GBGCA-R — Wellness Programs

Policy Advisory No. 981 ..... ***DELETED*** Policy GBGCB — Staff Health and Safety
DELETED Exhibit GBGCB-E — Staff Health and Safety

Policy Advisory No. 982 ..... Policy GBGD — Workers' Compensation
Regulation GBGD-R — Workers' Compensation
Exhibit GBGD-E — Workers' Compensation

Policy Advisory No. 983 .....Policy GBI — Staff Participation in Political Activities

Policy Advisory No. 984 .....Policy GBJ — Personnel Records and Files
NEW Regulation GBJ-R —Personnel Records and Files
DELETED Exhibit GBJ-E — Personnel Records and Files

Policy Advisory No. 985 Policy GBK — Staff Grievances
Regulation GBK-R — Staff Grievances
Exhibit GBK-EA — Staff Grievances
Exhibit GBK-EB — Staff Grievances
Exhibit GBK-EC — Staff Grievances
Exhibit GBK-ED — Staff Grievances
Exhibit GBK-EE — Staff Grievances

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Policy Advisory No. 986 ..... Policy GBP — Prohibited Personnel Practices

Policy Advisory No. 987 ..... ***DELETED*** Policy GCA — Professional Staff Positions

Policy Advisory No. 988 ..... Policy GCB — Professional Staff Contracts and Compensation

Policy Advisory No. 989 ..... Policy GCBA — Professional Staff Salary Schedules

Policy Advisory No. 990 ..... ***DELETED*** Policy GCBC — Professional Staff Supplementary Pay Plans

Policy Advisory No. 991 ..... ***DELETED*** Policy GCBD — Professional Staff Fringe Benefits

Policy Advisory No. 992 ..... ***DELETED*** Policy GCC — Professional / Support Staff Leaves and Absences

Policy Advisory No. 993 ..... Policy GCCA — Professional / Support Staff Sick Leave
NEW Regulation GCCA-RA Types of Leaves
NEW Regulation GCCA-RB Types of Leaves
NEW Regulation GCCA-RC Types of Leaves
NEW Exhibit GCCA-E Types of Leaves

Policy Advisory No. 994 ..... ***DELETED*** Policy GCCB — Professional / Support Staff Personal / Emergency / Religious Leave

Policy Advisory No. 995 ..... ***DELETED*** Policy GCCC — Professional / Support Staff Leaves of Absence without Pay
DELETED Exhibit GCCC-EA — Professional / Support Staff Leaves of Absence without Pay
DELETED Exhibit GCCC-EB — Professional / Support Staff Leaves of Absence without Pay
DELETED Exhibit GCCC-EC — Professional / Support Staff Leaves of Absence without Pay
DELETED Exhibit GCCC-ED — Professional / Support Staff Leaves of Absence without Pay
DELETED Exhibit GCCC-EE — Professional / Support Staff Leaves of Absence without Pay

Policy Advisory No. 996 ..... ***DELETED*** Policy GCCC — Professional / Support Staff Leaves of Absence without Pay (*Fewer than 50 Employees*)

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Policy Advisory No. 997 ..... ***DELETED*** Policy GCCD — Professional / Support Staff Military / Legal Leave
DELETED Exhibit GCCD-E — Professional / Support Staff Military / Legal Leave

Policy Advisory No. 998 ..... ***DELETED*** Policy GCCE — Professional / Support Staff Conferences / Visitations / Workshops

Policy Advisory No. 999 ..... ***DELETED*** Policy GCCF — Sabbatical Leave

Policy Advisory No. 1000 ... ***DELETED*** Policy GCCG — Professional Staff Voluntary Transfer of Accrued Sick Leave
DELETED Regulation GCCG-RA — Professional Staff Voluntary Transfer of Accrued Sick Leave
DELETED Regulation GCCG-RB — Professional Staff Voluntary Transfer of Accrued Sick Leave

Policy Advisory No. 1001 .... ***DELETED*** Policy GCCH — Professional / Support Staff Bereavement Leave

Policy Advisory No. 1002 ..... ***DELETED*** Policy GCD — Professional Staff Vacations and Holidays

Policy Advisory No. 1003 ..... Policy GCF — Professional Staff Hiring
Regulation GCF-R — Professional Staff Hiring
Exhibit GCF-EA — Professional Staff Hiring
Exhibit GCF-EB — Professional Staff Hiring
Exhibit GCF-EC — Professional Staff Hiring
Exhibit GCF-ED — Professional Staff Hiring
NEW Exhibit GCF-EE – Hiring
NEW Exhibit GCF-EF — Hiring

Policy Advisory No. 1004 ..... Policy GCFC — Professional Staff Certification and Credentialing Requirements
Exhibit GCFC-E — Professional Staff Certification and Credentialing Requirements

Policy Advisory No. 1005 ..... ***DELETED*** Policy GCFE — Professional / Support Staff Hiring – Oath of Office
DELETED Exhibit GCFE-E — Professional / Support Staff Hiring – Oath of Office

Policy Advisory No. 1006 ..... Policy GCG — Time and Substitute Professional Staff Employment

Policy Advisory No. 1007 .. ***DELETED*** Policy GCGB — Arrangements for Substitute Staff Members
DELETED Regulation GCGB-R — Arrangements for Substitute Staff Members

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Policy Advisory No. 1008 ..... Policy GCH — Professional / Support Staff Orientation and Training

Policy Advisory No. 1009 .. ***DELETED*** Policy GCI — Professional Staff Development

Policy Advisory No. 1010 .. ***DELETED*** Policy GCJ — Professional Staff Probationary and Continuing Status

Policy Advisory No. 1011 ..... Policy GCK — Professional Staff Assignments and Transfers

Policy Advisory No. 1012 ..... ***DELETED*** Policy GCL — Professional Staff Schedules and Calendars

Policy Advisory No. 1013 .... ***DELETED*** Policy GCMC — Professional Staff Meetings

Policy Advisory No. 1014 .....Policy GCMF — Professional Staff Duties and Responsibilities
NEW Regulation GCMF-RA – Duties and Responsibilities
NEW Regulation GCMF-RB – Duties and Responsibilities

Policy Advisory No. 1015 ..... Policy GCO — Evaluation of Professional Staff Members
Regulation GCO-RA— Evaluation of Professional Staff Members
DELETED Regulation GCO-RB — Evaluation of Professional Staff Members
NEW Exhibit GCO-E – Evaluations and Contracts

Policy Advisory No. 1016 ... ***DELETED*** Policy GCP — Professional Staff Promotions

Policy Advisory No. 1017 .....Policy GCQA — Professional Staff Reduction in Force

Policy Advisory No. 1018 ..... Policy GCQC — Resignation of Professional Staff Members

Policy Advisory No. 1019 .... ***DELETED*** Policy GCQE — Retirement of Professional / Support Staff Members

Policy Advisory No. 1020 .....Policy GCQF — Discipline, Suspension, and Dismissal of Professional Staff Members
NEW Regulation GCQF-RA – Discipline, Suspension, and Dismissal
NEW Regulation GCQF-RB – Discipline, Suspension, and Dismissal

Policy Advisory No. 1021 .....Policy GCR — Nonschool Employment by Professional Staff Members

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Policy Advisory No. 1022 ..... Policy GCRD — Tutoring for Pay

Policy Advisory No. 1023 ..... Policy GCS — Professional Research and Publishing

Policy Advisory No. 1024 ..... ***DELETED*** Policy GDA — Support Staff Positions

Policy Advisory No. 1025 ..... ***DELETED*** Policy GDB — Support Staff Contracts and Compensation

Policy Advisory No. 1026 ..... ***DELETED*** Policy GDBA — Support Staff Salary

Policy Advisory No. 1027 . ***DELETED*** Policy GDBC — Support Staff Supplementary Pay / Overtime

Policy Advisory No. 1028 . ***DELETED*** Policy GDBD — Support Staff Fringe Benefits

Policy Advisory No. 1029 ....***DELETED*** Policy GDCG — Support Staff Voluntary Transfer of Accrued Sick Leave
DELETED Regulation GDCG-R — Support Staff Voluntary Transfer of Accrued Sick Leave

Policy Advisory No. 1030 ..... ***DELETED*** Policy GDD — Support Staff Vacations and Holidays

Policy Advisory No. 1031 ..... ***DELETED*** Policy GDF — Support Staff Hiring
DELETED Regulation GDF-R — Support Staff Hiring
DELETED Exhibit GDF-EA — Support Staff Hiring
DELETED Exhibit GDF-EB — Support Staff Hiring
DELETED Exhibit GDF-EC — Support Staff Hiring
DELETED Exhibit GDF-ED — Support Staff Hiring
DELETED Exhibit GDF-EE — Support Staff Hiring

Policy Advisory No. 1032 .... ***DELETED*** Policy GDFA — Support Staff Qualifications and Requirements
DELETED Exhibit GDFA-E — Support Staff Qualifications and Requirements

Policy Advisory No. 1033 ..... ***DELETED*** Policy GDG — Part-Time and Substitute Support Staff Employment

Policy Advisory No. 1034 ..... ***DELETED*** Policy GDJ — Support Staff Assignments and Transfers

Policy Advisory No. 1035 ..... ***DELETED*** Policy GDK — Support Staff Schedules and Calendars

Policy Advisory No. 1036 ..... ***DELETED*** Policy GDL — Support Staff Workload
DELETED Regulation GDL-R — Support Staff Workload

Policy Advisory No. 1037 ..... ***DELETED*** Policy GDLB — Support Staff Meetings

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Policy Advisory No. 1038 ..... ***DELETED*** Policy GDN — Supervision of Support Staff Members

Policy Advisory No. 1039 ..... ***DELETED*** Policy GDO — Evaluation of Support Staff Members
DELETED Exhibit GDO-EA — Evaluation of Support Staff Members
DELETED Exhibit GDO-EB — Evaluation of Support Staff Members

Policy Advisory No. 1040 ..... ***DELETED*** Policy GDP — Support Staff Promotions and Reclassification

Policy Advisory No. 1041 ..... ***DELETED*** Policy GDQA — Support Staff Reduction In Force

Policy Advisory No. 1042 ..... ***DELETED*** Policy GDQB — Resignation of Support Staff Members

Policy Advisory No. 1043 .... ***DELETED*** Policy GDQD — Discipline, Suspension, and Dismissal of Support Staff Members

Policy Advisory No. 1044 ..... ***DELETED*** Policy GDR — Nonschool Employment by Support Staff Members

Policy Advisory No. 1045 ..... Policy ECAC — Vandalism and Reporting Suspected Crimes
Regulation ECAC-R — Vandalism and Reporting Suspected Crimes

Policy Advisory No. 1046 ..... Policy IHAL — Teaching About Religion

POLICY ADVISORY DISCUSSION

Summary

Section G Revisions

Section G revisions are due to a reorganization that aligns similar policy content and maintains comprehensive information for effective Board governance and District operations. In addition, support staff policy documents coded "GD" have been merged with corresponding "GC" documents to avoid duplication of information. The policy documents listed above have either been removed, added due to recodification, merged with policy documents containing similar topics, or revised (**see Discussions below for specific information regarding each document**). Documents not listed in this comparison document from Section G did not change. The Clean Copy document linked on the Policy Advisory communication provides the revised Section G in its entirety.

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Policy Advisory Discussion

Policy Advisory No. 961 ***DELETED* Policy GA — Personal Goals / Priority Objectives**

Policy language formerly included in Policy GA has been revised and incorporated into Policy GB to improve clarity and alignment. Accordingly, Policy GA has been removed from the model manual.

Policy Advisory No. 962 **Policy GB — General Personnel Policies**

The original language in Policy GB has been retained, while incorporating content from the former Policy GA to improve clarity and alignment. In addition, headings have been added, "General" was removed from the title, and one sentence encouraging employee participation in decision-making, previously found under the now-deleted Policy GBB, has been included under the heading *Personnel Guidelines*.

Policy Advisory No. 963 **Policy GBA — Equal Employment Opportunity**
Regulation GBA-R — Equal Employment Opportunity
Exhibit GBA-E — Equal Employment Opportunity

The titles of the policy, regulation, and exhibit have been updated to include "and Non-Discrimination," now reading *Equal Employment Opportunity and Non-Discrimination*. Language aligned with Policy AC – *Nondiscrimination/Equal Opportunity* has been incorporated, and additional revisions were made to expand and clarify the policy. In addition, headings were added to the regulation, and the exhibit was revised to include a date line next to the signature line for clarity.

Policy Advisory No. 964 **Policy GBAC — Indian Preference in Employment**

Legal references have been updated in Policy GBAC.

Policy Advisory No. 965 ***DELETED* Policy GBB — Staff Involvement in Decision Making**

Language from Policy GBB encouraging employee participation in decision-making has been condensed and incorporated into Policy GB under the heading *Personnel Guidelines*. Therefore, Policy GBB has been removed from the model manual.

Policy Advisory No. 966 **Policy GBEA — Staff Ethics**
***NEW* Regulation GBEA-R Ethics and Code of Conduct**
***NEW* Exhibit GBEA-E Ethics and Code of Conduct**

The policy title has been updated to include "and Code of Conduct," now reading *Ethics and Code of Conduct*.

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Content from former Policy GBEB addressing potential consequences for District employees who violate rules has been incorporated into Policy GBEA. Accordingly, Policy GBEB has been removed from the model manual. Provisions concerning the use of physical force have been cross-referenced in Regulation GBEA-R (M.) and in Policy JLDB, while the reference to unauthorized weapons possession or carry in the opening paragraph has been removed, as this topic is already addressed in Regulation GBEA-R (G.). The legal references have also been updated to include A.R.S. 15-105, relating to restraint, and A.R.S. 13-403, relating to the use of physical force.

Under the new *Code of Conduct* heading in Policy GBEA, the list of staff expectations has been revised for clarity and expanded to include provisions on protecting students (C.) and maintaining confidentiality (M.).

Regulation GBEB-R and Exhibit GBEB-E have been recodified as GBEA-R and GBEA-E, respectively, with corresponding removals from the model manual. Additional information concerning restraint and seclusion (M.) and inappropriate personal relationships with students (L.) has been added to Regulation GBEA-R. Finally, staff expectation language originally contained in GBEB-R has been updated for clarity and incorporated into Policy GBEA under the *Code of Conduct* section, as well as Policy ECAC under the heading *Observed Weapons and Drug-Free School Zone Violations* and Regulation ECAC-R under the heading *Suspected Crimes or Incidents Reporting*.

Policy Advisory No. 967 **Policy GBEAA — Staff Conflict of Interest**
Exhibit GBEAA-E — Staff Conflict of Interest

Policy GBEAA was revised to add hiring provisions, including the substitute-teacher exception for small school districts in A.R.S. 15-421, for clarity. The policy was also aligned more closely with Arizona conflict-of-interest law, including the substantial-interest framework in A.R.S. 38-502 through 38-509, and the Uniform System of Financial Records (USFR) guidance regarding annual employee conflict-of-interest disclosures and retention of related records. The titles of the policy and exhibit were updated to *Conflict of Interest*. The exhibit was further revised to clarify employee disclosure obligations, where disclosures are to be filed and maintained, and when updated disclosures must be submitted.

Policy Advisory No. 968 ***DELETED* Policy GBEB — Staff Conduct**
***DELETED* Regulation GBEB-R — Staff Conduct**
***DELETED* Exhibit GBEB-E — Staff Conduct**

Information from Policy GBEB was incorporated into Policy GBEA and Regulation GBEA-R; therefore, Policy GBEB has been removed from the model manual. Regulation GBEB-R and Exhibit GBEB-E have been recodified as GBEA-R and GBEA-E, respectively, with the corresponding removals of GBEB-R and GBEB-E from the model manual.

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Policy Advisory No. 969 **Policy GBEBB — Staff Conduct with Students**

Policy GBEBB was reorganized and reworded for clarity to emphasize employee expectations regarding professional relationships with students and appropriate staff conduct. The revised policy consolidates supervision, behavioral, and professional standards into a concise list format and reinforces compliance with A.R.S. 15-105 and Policy JLDB on restraint and seclusion.

Policy Advisory No. 970 **Policy GBEBC — Gifts to and Solicitations by Staff Members**

Policy GBEBC was reworded for clarity, and existing provisions regarding gifts to employees and gifts to students were separated into distinct sections with new headings for easier reference.

Policy Advisory No. 971 **Policy GBEC — Drug - Free Workplace**
***NEW* Regulation GBEC-R — Drug - Free Workplace**
Exhibit GBEC-EA — Drug - Free Workplace
***DELETED* Exhibit GBEC-EB — Drug - Free Workplace**

Policy GBEC has been updated to incorporate language from Policies GBECA and GBECB; therefore, those policies have been removed from the model manual. To reflect the expanded content, the policy, regulation, and exhibit titles have been revised to *Alcohol and Drug-Free Workplace*. Additional information clarifying the possession of alcohol in an employee's personal vehicle was added under the heading *Exceptions*, and new definitions and subheadings were included to enhance clarity and organization. The accompanying Exhibit GBEC-E was also updated to specify that an employee's notification to their supervisor of a conviction must be made in writing, clarifying the required method of notification. Exhibit GBEC-EB was recodified as Regulation GBEC-R due to its content, and Legal References were updated.

Policy Advisory No. 972 ***DELETED* GBECA — Nonmedical Use or Abuse of Drugs or Alcohol**

Language from Policy GBECA was incorporated into Policy GBEC; therefore, Policy GBECA has been removed from the model manual.

Policy Advisory No. 973 ***DELETED* Policy GBECB — Alcohol use by Staff Members**

Language from Policy GBECB was incorporated into Policy GBEC; therefore, Policy GBECB has been removed from the model manual.

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Policy Advisory No. 974 **Policy GBED — Smoking by Staff Members**

Headings were added for organization, and clarifying language was included under *Violations* to specify that employees who violate the policy are subject to disciplinary action, up to and including dismissal. Additional language was added under *Exceptions* to address the possession of legal tobacco products, tobacco substitutes, electronic cigarettes, or vapor products in an employee's locked personal vehicle, while maintaining the prohibition on their use on District property or at District-sponsored activities.

Policy Advisory No. 975 **Policy GBEF — Staff Use of Digital Communications and Electronic Devices**

Language from Policy GBEFA was incorporated into Policy GBEF; therefore, Policy GBEFA was removed from the model manual. The definition of *social media* was streamlined and modernized for clarity and relevance. References to specific platforms and technologies (e.g., Facebook, LinkedIn, X, YouTube, Android, iPhone) were removed to ensure the policy remains current as technologies evolve. The revised language groups these platforms into broader categories, such as social networking sites, blogs, microblogs, and content or virtual communities, and retains the reference to "successor protocols" to encompass emerging forms of communication. The overall update reduces redundancy, simplifies technical descriptions, and enhances long-term applicability without altering the intent of the policy. Headings were also added to improve organization, and a reference to the Child Internet Protection Act (CIPA) was included under the heading *Guidelines*.

Policy Advisory No. 976 ***DELETED* Policy GBEFA — Staff Use of Digital Wireless Communications or Electronic Devices While Operating a Motor Vehicle**

Language from Policy GBEFA was incorporated into Policy GBEF under the following headings: *Operating a Portable Wireless Communication Device While Driving, Definitions,* and *Training*; therefore, Policy GBEFA was removed from the model manual.

Policy Advisory No. 977 ***NEW* Policy GBGA — Health**
***NEW* Regulation GBGA-RA — Health**
***NEW* Regulation GBGA-RB — Health**
***NEW* Exhibit GBGA-EA — Health**
***NEW* Exhibit GBGA-EB — Health**

Newly created Policy GBGA consolidates health, safety, and protective measures previously contained in Policies GBGB, GBGC, GBGCA, and GBGCB; therefore, these policies have been removed from the model manual. Disease-specific language regarding HIV/AIDS transmission, as well as the paragraph describing notification to staff with special vulnerabilities during outbreaks, have been removed from GBGA.

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These topics are now addressed generally through provisions on universal precautions, confidentiality, and reporting/notification, with references to applicable public-health directives. Language from former Policy GBGC regarding District-directed medical tests or examination for employment, retention, or when an employee's condition warranted examination was not carried forward, as GBGA is focused on communicable-disease management, bloodborne-pathogen controls, immunizations, universal precautions, and eye protection. For reference, the Equal Employment Opportunity Commission's (EEOC) *Enforcement Guidance on Disability-Related Inquiries and Medical Examinations of Employees under the ADA* provides the applicable standard for employer-required medical examinations. Language under the heading *Threats* from GBGB was also not carried forward because threat-response protocols are generally addressed within the District's safety and security framework. Regulation GBGCA-R has been recodified as GBGA-RA, and Regulation GBGB-R has been recodified as GBGA-RB; accordingly, GBGCA-R and GBGB-R have been removed from the model manual. Exhibit GBGC-E has been recodified as GBGA-EA, and Exhibit GBGCB-E has been recodified as GBGA-EB; accordingly, GBGC-E and GBGCB-E have been removed from the model manual. Exhibit GBGA-EB includes minor updates to align with current CDC guidance.

Policy Advisory No. 978 *DELETED* Policy GBGB — Staff Personal Security and Safety
***DELETED* Regulation GBGB-R — Staff Personal Security and Safety**

Language from Policy GBGB pertaining to Eye Protective Devices has been incorporated into Policy GBGA under that heading; accordingly, Policy GBGB has been removed from the model manual. As noted in Policy Advisory 977, the language under the heading *Threats* was not carried forward as those protocols are generally addressed in the District's safety and security plans. Provisions from Regulation GBGB-R regarding Eye Protective Devices have been recodified as GBGA-RB; accordingly, GBGB-R has been removed from the model manual.

Policy Advisory No. 979 *DELETED* Policy GBGC — Employee Assistance
***DELETED* Exhibit GBGC-E — Employee Assistance**

Language from Policy GBGC was incorporated into Policy GBGA under the headings *Required Compliance Procedures* and *Bloodborne Pathogens Exposure;* accordingly, Policy GBGC has been removed from the model manual. As noted in Policy Advisory 977, the EEOC provides guidance regarding the standard for employers seeking medical examinations of employees. Exhibit GBGC-E has been recodified as GBGA-EA; accordingly, GBGC-E has been removed from the model manual.

Policy Advisory No. 980 *DELETED* Policy GBGCA — Wellness Programs
***DELETED* Regulation GBGCA-R — Wellness Programs**

A general statement from Policy GBGCA was incorporated into Policy GBGA under the heading *Immunization,* and disease-specific immunity information was incorporated into Regulation GBGA-RA; therefore, Policy GBGCA was removed from the model manual. Regulation GBGCA-R was recodified as GBGA-RA; accordingly, GBGCA-R has been removed from the model manual.

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Policy Advisory No. 981 ***DELETED*** **Policy GBGCB — Staff Health and Safety**
DELETED **Exhibit GBGCB-E — Staff Health and Safety**

Language from Policy GBGCB was incorporated into Policy GBGA under the headings *Communicable Diseases, COVID-19, Universal Precautions, Exclusion from School, Reporting and Notification, Confidentiality,* and *Food Service Workers;* accordingly, Policy GBGCB has been removed from the model manual. Exhibit GBGCB-E has been recodified as GBGA-EB; accordingly, GBGCB-E has been removed from the model manual.

Policy Advisory No. 982 **Policy GBGD — Workers' Compensation**
Regulation GBGD-R — Workers' Compensation
Exhibit GBGD-E — Workers' Compensation

The policy and regulation were revised to clarify coverage by replacing "accident" with "personal injury by accident," aligning the terminology with A.R.S. 23-904. Exhibit GBGD-E was also updated: Item "C." and the final paragraph were revised to align with EEOC/ADA return-to-work standards.

Policy Advisory No. 983 **Policy GBI — Staff Participation in Political Activities**

Policy GBI was updated with minor edits, including expanding the prohibition on using District assets to influence elections to include "or any other thing of value of the District," consistent with A.R.S. 15-511.

Policy Advisory No. 984 **Policy GBJ — Personnel Records and Files**
NEW **Regulation GBJ-R — Personnel Records and Files**
DELETED **Exhibit GBJ-E — Personnel Records and Files**

Policy GBJ was reorganized with headings, and teacher confidentiality protections under A.R.S. 15-537 were added for clarity. Exhibit GBJ-E was recodified as a Regulation GBJ-R due to its compliance directive and replaced "bulleted above" with "listed above" in Item 4.a.

Policy Advisory No. 985 **Policy GBK — Staff Grievances**
Regulation GBK-R — Staff Grievances
Exhibit GBK-EA — Staff Grievances
Exhibit GBK-EB — Staff Grievances
Exhibit GBK-EC — Staff Grievances
Exhibit GBK-ED — Staff Grievances
Exhibit GBK-EE — Staff Grievances

Policy GBK has been updated to include the Board's discretionary delegation to the Superintendent to establish an employee grievance procedure. Timelines remain a local decision; if the Board modifies the timelines in policy, the accompanying regulation and exhibits must be updated for consistency. Cross references were also added to the policy, and the regulation and exhibits were revised to specify "business" days for clarity and alignment with the policy.

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Policy Advisory No. 986 **Policy GBP — Prohibited Personnel Practices**

Policy GBP was retitled *Reprisals* to more accurately reflect its scope, improving alignment between the title and the policy's content.

Policy Advisory No. 987 ***DELETED* Policy GCA — Professional Staff Positions**

Policy GCA has been removed from the model manual as its provisions are primarily operational and generally covered by HR procedures. Districts may retain the policy locally if it aligns with and supports their internal processes.

Policy Advisory No. 988 **Policy GCB — Professional Staff Contracts and Compensation**

Policy GCB was reorganized with headings and added definitions to improve clarity. Content from Policies GCBD, GDB, and GDBD was consolidated into GCB; accordingly, GCBD, GDB, and GDBD have been removed from the model manual. The title was revised to *Compensation* to better reflect the policy's scope and contents.

Policy Advisory No. 989 **Policy GCBA — Professional Staff Salary Schedules**

Policy GCBA consolidates content from GCBC, GDBA, and GDBC; accordingly, those policies have been removed from the model manual. Headings were added for clarity, and the title was updated to *Salaries* to better reflect the policy's scope. The *Advancement on Salary Schedule* criteria (Items A–D) were revised to replace vague phrases with specific, documentable standards tied to job duties, compliance, and professional conduct.

Policy Advisory No. 990 ***DELETED* Policy GCBC — Professional Staff Supplementary Pay Plans**

Policy GCBC was incorporated into Policy GCBA under the heading *Extra-Duty*; accordingly, Policy GCBC was removed from the model manual.

Policy Advisory No. 991 ***DELETED* Policy GCBD — Professional Staff Fringe Benefits**

Policy GCBD was incorporated into Policy GCB under the heading *Salaries and Benefits*; accordingly, Policy GCBD was removed from the model manual.

Policy Advisory No. 992 ***DELETED* Policy GCC — Professional / Support Staff Leaves and Absences**

Policy GCC was incorporated into Policy GCCA under the heading *Absent Without Leave*; accordingly, Policy GCC was removed from the model manual.

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Policy Advisory No. 993 **Policy GCCA — Professional / Support Staff Sick Leave**
***NEW* Regulation GCCA-RA Types of Leaves**
***NEW* Regulation GCCA-RB Types of Leaves**
***NEW* Regulation GCCA-RC Types of Leaves**
***NEW* Exhibit GCCA-E Types of Leaves**

To improve clarity, reduce redundancy, and centralize statutory references in one place, multiple leave-related policies (GCC, GCCA, GCCB, GCCC, GCCD, GCCE, GCCF, GCCG, GCCH, GCD, GDCG, and GDD) were consolidated into a single, comprehensive policy (GCCA – Types of Leaves). The unified policy organizes all common leave types—sick leave and earned paid sick time (A.R.S. 23-372, 23-373), FMLA (29 U.S.C. 2601–2654; 29 C.F.R. Part 825), banked/voluntary sick-leave transfer, personal and bereavement leave, victim leave (A.R.S. 8-420/13-4439), jury duty (A.R.S. 21-236), voting leave (A.R.S. 16-402), military/USERRA (A.R.S. 26-168; 38-610; 38 U.S.C. 4303), holidays (A.R.S. 15-801), vacation leave, sabbatical leave (A.R.S. 15-510), professional development leave, unpaid leaves of absence, and absent without leave—under clear headings. Districts may localize details, such as the number and use of personal days, leave-request lead times, and vacation-leave provisions, within the updated policy or in accompanying regulations.

Newly created Regulation GCCA-RA includes content on Arizona earned paid sick time previously detailed in Policy GCCA, and consolidates and clarifies the "use," "accrual," "notice," "retaliation," and "definitions" provisions drawn from A.R.S. 23-371, 23-372, 23-373, and 23-364.

Policy GCCC's detailed leave-of-absence and FMLA provisions have been reorganized into newly created Regulation GCCA-RB to simplify navigation and separate policy from procedure; accordingly, GCCC has been removed from the model manual. Operational, statute-driven FMLA content, previously in Policy GCCC, aligns process and forms to U.S. Department of Labor guidance; clarifies coverage thresholds; and notes universal posting requirements with links to the DOL resources. Forms provided in Exhibits GCCC-EA, GCCC-EB, GCCC-EC, GCCC-ED, and GCCC-EE may now be accessed via the link provided in GCCA-RB under the heading *Regulations, Process and Forms*, accordingly, Exhibits GCCC-EA through GCCC-EE have been removed from the model manual.

Policy GCCE's content has been recodified as Regulation GCCA-RC to consolidate leave provisions under GCCA and keep day-to-day procedures in the regulation. In the newly created GCCA-RC, the prior "at least 20 days' advance approval" requirement was removed to allow districts to set local timelines administratively, while the decision guides for released time/travel (value of event, budget availability, and substitute coverage) were retained.

Exhibit GCCD-E has been recodified as GCCA-E; accordingly, GCCD-E has been removed from the model manual.

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Policy Advisory No. 994 ***DELETED* Policy GCCB — Professional / Support Staff Personal / Emergency / Religious Leave**

Policy GCCB was incorporated into Policy GCCA under the heading *Personal Leave*; accordingly, Policy GCCB was removed from the model manual.

Policy Advisory No. 995 ***DELETED* Policy GCCC — Professional / Support Staff Leaves of Absence without Pay**
***DELETED* Exhibit GCCC-EA — Professional / Support Staff Leaves of Absence without Pay**
***DELETED* Exhibit GCCC-EB — Professional / Support Staff Leaves of Absence without Pay**
***DELETED* Exhibit GCCC-EC — Professional / Support Staff Leaves of Absence without Pay**
***DELETED* Exhibit GCCC-ED — Professional / Support Staff Leaves of Absence without Pay**
***DELETED* Exhibit GCCC-EE — Professional / Support Staff Leaves of Absence without Pay**

Policy GCCC has been incorporated into Policy GCCA under the headings *Family and Medical Leave, Leaves of Absence Without Pay, Requests for Leave, Approval,* and *Preservation of Rights for Continuing Certificated Teachers* and Regulation GCCA-RB; accordingly, Policy GCCC has been removed from the model manual. Forms provided in Exhibits GCCC-EA, GCCC-EB, GCCC-EC, GCCC-ED, and GCCC-EE may now be accessed via the link provided in GCCA-RB under the heading *Regulations, Process and Forms*, accordingly, Exhibits GCCC-EA through GCCC-EE have been removed from the model manual.

Policy Advisory No. 996 ***DELETED* Policy GCCC — Professional / Support Staff Leaves of Absence without Pay (*Fewer than 50 Employees*)**

Content from Policy GCCC (applicable to districts with fewer than fifty employees) has been incorporated into Policy GCCA and Regulation GCCA-RB; accordingly, GCCC has been removed from the model manual.

Policy Advisory No. 997 ***DELETED* Policy GCCD — Professional / Support Staff Military / Legal Leave**
***DELETED* Exhibit GCCD-E — Professional / Support Staff Military / Legal Leave**

Policy GCCD has been incorporated into Policy GCCA under the headings *Victim Leave, Jury Duty Leave,* and *Military Leave*; accordingly, Policy GCCD has been removed from the model manual. Exhibit GCCD-E has been recodified as GCCA-E; accordingly, GCCD-E has been removed from the model manual.

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Policy Advisory No. 998 ***DELETED* Policy GCCE — Professional / Support Staff Conferences / Visitations / Workshops**

Policy GCCE has been incorporated into Policy GCCA under the heading *Professional Development Leave* and Regulation GCCA-RC; accordingly, GCCE has been removed from the model manual.

Policy Advisory No. 999 ***DELETED* Policy GCCF — Sabbatical Leave**

Policy GCCF has been incorporated into Policy GCCA under the heading *Sabbatical Leave*; accordingly, GCCF has been removed from the model manual.

Policy Advisory No. 1000 ***DELETED* Policy GCCG — Professional Staff Voluntary Transfer of Accrued Sick Leave**
***DELETED* Regulation GCCG-RA — Professional Staff Voluntary Transfer of Accrued Sick Leave**
***DELETED* Regulation GCCG-RB — Professional Staff Voluntary Transfer of Accrued Sick Leave**

Policy GCCG has been removed from the model manual as its detailed, operational provisions are more appropriately addressed in District HR procedures or in a regulation. To preserve local flexibility, Policy GCCA now includes a concise sentence authorizing districts to offer a voluntary transfer of accrued sick leave (banked sick leave) at their option. This approach avoids prescriptive program details in policy and allows districts to tailor any sick-leave bank through a regulation and/or HR procedure. Districts that use a sick-leave bank may incorporate the prior elements in a GCCA regulation or retain GCCG locally if preferred. Accordingly, GCCG-RA and GCCG-RB have been removed from the model manual; districts that maintain a sick-leave bank may retain these regulations locally.

Policy Advisory No. 1001 ***DELETED* Policy GCCH — Professional / Support Staff Bereavement Leave**

Policy GCCH is referenced in Policy GCCA under the heading *Personal Leave*; accordingly, GCCH has been removed from the model manual.

Policy Advisory No. 1002 ***DELETED* Policy GCD — Professional Staff Vacations and Holidays**

Policy GCD was incorporated into Policy GCCA under the headings *Holiday Leave* and *Vacation Leave*; accordingly, GCD was removed from the model manual.

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Policy Advisory No. 1003 **Policy GCF — Professional Staff Hiring**
Regulation GCF-R — Professional Staff Hiring
Exhibit GCF-EA — Professional Staff Hiring
Exhibit GCF-EB — Professional Staff Hiring
Exhibit GCF-EC — Professional Staff Hiring
Exhibit GCF-ED — Professional Staff Hiring
***NEW* Exhibit GCF-EE — Hiring**
***NEW* Exhibit GCF-EF — Hiring**

Policies GCFE and GDF have been incorporated into Policy GCF; accordingly, Policies GCFE and GDF have been removed from the model manual. The title of the policy, along with the titles of its accompanying regulation and exhibits, has been updated to *Hiring* to reflect that these documents address both certificated and noncertificated employees. Headings were also added, and language was refined for clarity. Regulation GDF-R was incorporated into GCF-R; accordingly, GDF-R was removed from the model manual. Exhibit GDF-EC was revised and incorporated into GCF-EA; accordingly, GDF-EC was removed from the model manual. Exhibit GDF-ED was revised and incorporated into GCF-EB; accordingly, GDF-ED was removed from the model manual. Exhibit GDF-EE was revised and incorporated into GCF-ED; accordingly, GDF-EE was removed from the model manual. Exhibit GCFE-E was recodified as GCF-EE, accordingly, GCFE-E was removed from the model manual. Exhibits GDF-EA and GDF-EB were revised and combined as GCF-EF.

Policy Advisory No. 1004 **Policy GCFC — Professional Staff Certification and Credentialing Requirements**
Exhibit GCFC-E — Professional Staff Certification and Credentialing Requirements

Policy GDFA was incorporated into Policy GCFC; accordingly, GDFA was removed from the model manual. The policy and exhibit titles were updated to *Fingerprint Requirements* as both documents address certificated and noncertificated employees. Exhibit GDFA-E was incorporated into GCFC-E; accordingly, GDFA-E was removed from the model manual.

Policy Advisory No. 1005 ***DELETED* Policy GCFE — Professional / Support Staff Hiring – Oath of Office**
***DELETED* Exhibit GCFE-E — Professional / Support Staff Hiring – Oath of Office**

Policy GCFE was incorporated into Policy GCF under the heading *Oath of Office*; accordingly, GCFE was removed from the model manual. Exhibit GCFE-E was recodified as GCF-EE; accordingly, GCFE-E was removed from the model manual.

Policy Advisory No. 1006 **GCG — Time and Substitute Professional Staff Employment**

Policy GDG was incorporated into Policy GCG, accordingly, GDG was removed from the model manual.

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Policy Advisory No. 1007 *DELETED* Policy GCGB — Arrangements for Substitute Staff Members
***DELETED* Regulation GCGB-R — Arrangements for Substitute Staff Members**

Policy GCGB was incorporated into GCMF, accordingly, GCGB was removed from the model manual. Regulation GCGB-R was recodified as GCMF-RB, accordingly, GCGB-R was removed from the model manual.

Policy Advisory No. 1008 Policy GCH — Professional / Support Staff Orientation and Training

Policy GCH was updated with minor wording changes only. "Salary and fringe-benefit plans" was streamlined to "salary and benefit plans," and "self-improvement opportunities" was updated to "professional development opportunities."

Policy Advisory No. 1009 *DELETED* Policy GCI — Professional Staff Development

Policy GCI has been removed from the model manual as professional development (PD) expectations and processes are already addressed across existing policies and regulations (e.g., educator obligations in GBEA; the District's PD commitment in GB; orientation/PD for new hires in GCH; leave/approvals for PD in GCCA; and procedural criteria for release time and travel in GCCA-RC). Removing GCI avoids prescriptive provisions (e.g., credit-for-salary-advancement language) that are generally managed through local HR procedures and/or regulations. Districts that require additional detail (such as credit-eligible PD frameworks) may place it in a GCCA regulation and/or local HR guidance.

Policy Advisory No. 1010 *DELETED* Policy GCJ — Professional Staff Probationary and Continuing Status

Policy GCJ has been incorporated into Policy GCO under the heading *Definitions*; accordingly, GCJ has been removed from the model manual.

Policy Advisory No. 1011 Policy GCK — Professional Staff Assignments and Transfers

Policy GDJ has been incorporated into Policy GCK; accordingly, GDJ has been removed from the model manual. This update consolidates provisions applicable to certificated and noncertificated employees into a single policy so that all expectations regarding assignment, transfer, and prohibited transfer/re-assignment basis appear in one comprehensive policy.

Policy Advisory No. 1012 *DELETED* Policy GCL — Professional Staff Schedules and Calendars

Policy GCL was incorporated into Policy GCMF under the heading *Certificated Employees – Schedules*; accordingly, GCL was removed from the model manual.

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Policy Advisory No. 1013 ***DELETED* Policy GCMC — Professional Staff Meetings**

Policy GCMC was incorporated into Policy GCMF under the heading *All Employees – Meetings*; accordingly, GCMC was removed from the model manual.

Policy Advisory No. 1014 **Policy GCMF — Professional Staff Duties and Responsibilities**
***NEW* Regulation GCMF-RA – Duties and Responsibilities**
***NEW* Regulation GCMF-RB – Duties and Responsibilities**

To improve clarity, reduce redundancy, and centralize statutory references in one place, policies GCGB, GCL, GCMC, GDK, GDL, and GDLB were consolidated into a single, comprehensive policy (GCMF – Duties and Responsibilities). The A.–F. list originally in GCMF was removed because its content is addressed more generally in Policy GBEA and Regulation IKE-RA (regarding retention/promotion); taking and maintaining daily classroom attendance was retained in Policy GCMF. In addition, the information regarding sectarian instruction was moved to Policy IHAL – Teaching About Religion. Regulation GDL-R has been revised and recodified as GCMF-RA. For clarity and compliance, the updated regulation includes a direct link to 29 U.S.C. 207(o), which provides the controlling compensatory-time requirements. Regulation GCGB-R was recodified as GCMF-RB, accordingly, GCGB-R was removed from the model manual.

Policy Advisory No. 1015 **Policy GCO — Evaluation of Professional Staff Members**
Regulation GCO-RA — Evaluation of Professional Staff Members
***DELETED* Regulation GCO-RB — Evaluation of Professional Staff Members**
***NEW* Exhibit GCO-E – Evaluations and Contracts**

Policy GDO (Support Staff Evaluations) was incorporated into Policy GCO, consolidating all employee evaluation requirements into one policy and eliminating duplication; accordingly, GDO was removed from the model manual. The Definitions section was expanded and standardized by adding continuing teacher and probationary teacher, originally in Policy GCJ, and by using certificated and noncertificated consistently. Procedural provisions formerly included in the policy were moved to Regulation GCO-R. Regulations GCO-RA and GCO-RB were combined, revised, and recodified as GCO-R, with content reorganized into clear sections and key timelines clarified. Exhibits GDO-EA and GDO-EB were combined, revised, and recodified as GCO-E; accordingly, GDO-EA and GDO-EB were removed from the model manual.

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Policy Advisory No. 1016 ***DELETED* Policy GCP — Professional Staff Promotions**

Policy GCP was removed as its brief directive on filling positions of increased responsibility duplicated guidance now covered by Policies GCF and GCK; accordingly, GCP was removed from the model manual.

Policy Advisory No. 1017 **Policy GCQA — Professional Staff Reduction in Force**

Policy GDQA was incorporated into Policy GCQA under the heading *Noncertificated Employees*; accordingly, GDQA was removed from the model manual.

Policy Advisory No. 1018 **Policy GCQC — Resignation of Professional Staff Members**

Policy GDQB (Support Staff Resignations) and GCQC were consolidated into a single policy, GCQC, to centralize resignation procedures, eliminate duplication, and distinguish requirements for certificated and noncertificated employees; accordingly, GDQB was removed from the model manual. The GDQB clause on vacation payout was not retained as this practice is discretionary; however, districts may preserve language if applicable.

Policy Advisory No. 1019 ***DELETED* Policy GCQE — Retirement of Professional / Support Staff Members**

Policy GCQE was removed from the model manual as its retirement-incentive and sick-leave payout provisions are highly district-specific and fiscally variable. The Retirement Incentive Program portion was removed due to current retention priorities, and the Sick Leave Payment upon Retirement portion is already addressed generally in Regulation GCCA-RA (noting no statutory requirement to pay out accrued earned paid sick time). Districts that wish to offer sick-leave payouts upon separation may do so locally through GCCA-RA and/or HR procedures.

Policy Advisory No. 1020 **Policy GCQF — Discipline, Suspension, and Dismissal of Professional Staff Members**
***NEW* Regulation GCQF-RA – Discipline, Suspension, and Dismissal**
***NEW* Regulation GCQF-RB – Discipline, Suspension, and Dismissal**

Policy GCQF now incorporates the "Required" and "Not Allowed" provisions drawn directly from A.A.C. R7-2-1308 (Unprofessional and Immoral Conduct), grounding the listed categories of misconduct in the same rule framework used by the State Board of Education. This revision establishes a unified expectation for all employees (certificated and noncertificated) by applying the same standards of professional conduct across the District. Newly created Regulation GCQF-RA now contains the procedural information for certificated employees that previously appeared in the policy text. Newly created Regulation GCQF-RB consolidates the procedural information for noncertificated employees that was originally contained in Policy GDQD; accordingly, Policy GDQD has been removed from the model manual.

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Policy Advisory No. 1021 — Policy GCR — Nonschool Employment by Professional Staff Members

Policy language was streamlined for consistency and tone without changing the original intent, and the title was updated to reflect that the policy now applies to both certificated and noncertificated employees.

Policy Advisory No. 1022 — Policy GCRD — Tutoring for Pay

Legal references were expanded to include A.R.S. 15-341, 15-512, and 15-1105 to more fully reflect the statutory authority underlying this policy. A.R.S. 15-341 authorizes the Governing Board to prescribe and enforce policies governing employee conduct and use of District facilities. A.R.S. 15-512 addresses fingerprinting and related requirements for noncertificated individuals providing services to students, complementing the existing reference to A.R.S. 15-534 for certificated personnel. A.R.S. 15-1105 governs the lease and rental of school property, supporting the policy's requirement that private tutoring for pay on school premises occur only pursuant to an appropriate facility-use or rental agreement.

Policy Advisory No. 1023 — Policy GCS — Professional Research and Publishing

Policy GCS adds the heading "Proprietary Rights."

Policy Advisory No. 1024 — *DELETED* Policy GDA — Support Staff Positions

Policy GDA has been removed from the model manual as its provisions are primarily operational and generally covered by HR procedures. Districts may retain the policy locally if it aligns with and supports their internal processes (if retaining Policy GCA, these two policies may be combined to include both certificated and noncertificated employees).

Policy Advisory No. 1025 — *DELETED* Policy GDB — Support Staff Contracts and Compensation

Policy GDB was incorporated into Policy GCB under the headings *Compensation* and *Employment Status (Noncertificated)*; accordingly, GDB was removed from the model manual.

Policy Advisory No. 1026 — *DELETED* Policy GDBA — Support Staff Salary

Policy GDBA was incorporated into Policy GCBA under the heading *Noncertificated – Wages*; accordingly, Policy GDBA was removed from the model manual.

Policy Advisory No. 1027 — *DELETED* Policy GDBC — Support Staff Supplementary Pay / Overtime

Policy GDBC was incorporated into Policy GCBA under the heading *Noncertificated – Supplementary Pay / Overtime*; accordingly, Policy GDBC was removed from the model manual.

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Policy Advisory No. 1028 *DELETED* Policy GDBD — Support Staff Fringe Benefits

Policy GDBD was incorporated into Policy GCB under the subheading *Salaries and Benefits*; accordingly, Policy GDBD was removed from the model manual.

Policy Advisory No. 1029 *DELETED* Policy GDCG — Support Staff Voluntary of Accrued Sick Leave
***DELETED* Regulation GDCG-R — Support Staff Voluntary of Accrued Sick Leave**

Policy GDCG has been removed from the model manual as its detailed, operational provisions are more appropriately addressed in District HR procedures or in a regulation. To preserve local flexibility, Policy GCCA now includes a concise sentence authorizing districts to offer a voluntary transfer of accrued sick leave (banked sick leave) at their option. This approach avoids prescriptive program details in policy and allows districts to tailor any sick-leave bank through a regulation and/or HR procedure. Districts that use a sick-leave bank may incorporate the prior elements in a GCCA regulation or retain GDCG locally if preferred. Accordingly, GDCG-R has been removed from the model manual; districts that maintain a sick-leave bank may retain this regulation locally.

Policy Advisory No. 1030 *DELETED* Policy GDD — Support Staff Vacations and Holidays

Policy GDD was incorporated into Policy GCCA under the headings *Holiday Leave* and *Vacation Leave*; accordingly, GDD was removed from the model manual.

Policy Advisory No. 1031 *DELETED* Policy GDF — Support Staff Hiring
***DELETED* Regulation GDF-R — Support Staff Hiring**
***DELETED* Exhibit GDF-EA — Support Staff Hiring**
***DELETED* Exhibit GDF-EB — Support Staff Hiring**
***DELETED* Exhibit GDF-EC — Support Staff Hiring**
***DELETED* Exhibit GDF-ED — Support Staff Hiring**
***DELETED* Exhibit GDF-EE — Support Staff Hiring**

Policy GDF was incorporated into Policy GCF and GDF was removed from the model manual. Regulation GDF-R was incorporated into GCF-R and GDF-R was removed from the model manual. Exhibit GDF-EC was incorporated into GCF-EA; accordingly, GDF-EC as removed from the model manual. Exhibit GDF-ED was incorporated into GCF-EB; accordingly, GDF-ED was removed from the model manual. Exhibit GDF-EE was revised and incorporated into GCF-ED; accordingly, GDF-EE was removed from the model manual. Exhibits GDF-EA and GDF-EB were combined and recodified as GCF-EF; accordingly, GDF-EA and GDF-EB were removed from the model manual.

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Policy Advisory No. 1032 ***DELETED* Policy GDFA — Support Staff Qualifications and Requirements**
***DELETED* Exhibit GDFA-E — Support Staff Qualifications and Requirements**

Policy GDFA was incorporated into Policy GCFC; accordingly, GDFA was removed from the model manual. Exhibit GDFA-E was incorporated into GCFC-E; accordingly, GDFA-E was removed from the model manual.

Policy Advisory No. 1033 ***DELETED* Policy GDG — Part-Time and Substitute Support Staff Employment**

Policy GDG was incorporated into Policy GCG under the heading *Part-Time Employees*, accordingly, GDG was removed from the model manual.

Policy Advisory No. 1034 ***DELETED* Policy GDJ — Support Staff Assignments and Transfers**

Policy GDJ has been incorporated into Policy GCK; accordingly, GDJ has been removed from the model manual. This update consolidates provisions applicable to certificated and noncertificated employees into a single policy so that all expectations regarding assignment, transfer, and prohibited transfer/re-assignment basis appear in one comprehensive policy.

Policy Advisory No. 1035 ***DELETED* Policy GDK — Support Staff Schedules and Calendars**

Policy GDK was incorporated into Policy GCMF under the heading *Noncertificated Employees – Schedules*; accordingly, GDK was removed from the model manual.

Policy Advisory No. 1036 ***DELETED* Policy GDL — Support Staff Workload**
***DELETED* Regulation GDL-R — Support Staff Workload**

Policy GDL has been incorporated into Policy GCMF under the headings *Noncertificated Employees—Schedules* and *Overtime;* accordingly, GDL has been removed from the model manual. Regulation GDL-R has been revised and recodified as GCMF-RA. For clarity and compliance, the updated regulation includes a direct link to 29 U.S.C. 207(o), which provides the controlling compensatory-time requirements.

Policy Advisory No. 1037 ***DELETED* Policy GDLB — Support Staff Meetings**

Policy GDLB was incorporated into Policy GCMF under the heading *All Employees – Meetings*; accordingly, GDLB was removed from the model manual.

Policy Advisory No. 1038 ***DELETED* Policy GDN — Supervision of Support Staff Members**

Policy GDN was removed from the manual as information regarding a District-wide orientation program for all new employees is provided in Policy GCH. Supervisor and evaluation information for noncertificated employees is addressed in Policy GCO.

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Policy Advisory No. 1039 ***DELETED*** **Policy GDO — Evaluation of Support Staff Members**
DELETED **Exhibit GDO-EA — Evaluation of Support Staff Members**
DELETED **Exhibit GDO-EB — Evaluation of Support Staff Members**

Policy GDO has been incorporated into Policy GCO so all employee evaluation requirements appear in one policy and duplicative language is removed (accordingly, GDO was removed from the model manual). Exhibits GDO-EA and GDO-EB have been combined, revised, and recodified as GCO-E; accordingly, GDO-EA and GDO-EB have been removed from the model manual.

Policy Advisory No. 1040 ***DELETED*** **Policy GDP — Support Staff Promotions and Reclassification**

Policy GDP was removed from the manual because its content is now addressed in Policies GCF and GCK. Policy GCF establishes the District's commitment to selecting the most qualified candidates, and Policy GCK addresses assignments and transfers, including the requirement for Board approval when a transfer involves a change to a position with a different pay grade.

Policy Advisory No. 1041 ***DELETED*** **Policy GDQA — Support Staff Reduction In Force**

Policy GDQA was incorporated into Policy GCQA under the heading *Noncertificated Employees*; accordingly, GDQA was removed from the model manual.

Policy Advisory No. 1042 ***DELETED*** **Policy GDQB — Resignation of Support Staff Members**

Policy GDQB (Resignation of Support Staff Members) and GCQC (Resignation of Professional Staff Members) were consolidated into a single policy, GCQC, to centralize resignation procedures, eliminate duplication, and distinguish requirements for certificated and noncertificated employees; accordingly, GDQB was removed from the model manual. The GDQB clause on vacation payout was not retained as this practice is discretionary; however, districts may preserve language if applicable.

Policy Advisory No. 1043 ***DELETED*** **Policy GDQD — Discipline, Suspension, and Dismissal of Support Staff Members**

Newly created Regulation GCQF-RB consolidates the procedural information for noncertificated employees that was originally contained in Policy GDQD; accordingly, Policy GDQD has been removed from the model manual.

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Policy Advisory No. 1044 *DELETED* Policy GDR — Nonschool Employment by Support Staff Members

Policy GDR was removed from the model manual as its contents are provided in the updated Policy GCR – Nonschool Employment.

Policy Advisory No. 1045 Policy ECAC — Vandalism and Reporting Suspected Crimes
Regulation ECAC-R — Vandalism and Reporting Suspected Crimes

Language from Regulation GBEB-R (Staff Conduct) regarding employee reporting duties for observed weapons, firearms, drug-free school zone, and related safety incidents was incorporated into Policy ECAC and Regulation ECAC-R to better align those provisions with the District's school safety and crime-reporting content in Section E. The added policy language addresses the specific immediate reporting duties imposed by law when school personnel observe violations involving weapons, a minor in possession of a firearm, or drug-free school zone offenses. The added regulation language provides the administrative process for documenting, routing, and escalating those reports. Transferring these provisions to ECAC/ECAC-R improves organization, aligns the language with the District's school safety reporting framework, and separates these legal reporting duties from the more general employee-conduct provisions formerly housed in GBEB-R.

Policy Advisory No. 1046 ..... Policy IHAL — Teaching About Religion

The information regarding sectarian instruction formerly in Policy GCMF was moved to Policy IHAL.

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If you have any questions, call Policy Services at (602) 254-1100. Ask for Dr. Charlotte Patterson, Policy Analyst; Lynne Bondi, Policy Analyst; or Renae Watson, Policy Technician. Our e-mail addresses are, respectively, [cpatterson@azsba.org], [lbondi@azsba.org] and [rwatson@azsba.org]. You may also fax information to (602) 254-1177.

Note: This material is written for informational purposes only, and not as legal advice. You may wish to review the policy references and consult an attorney for further explanation.

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~~PERSONNEL GOALS / PRIORITY OBJECTIVES~~

~~The Board recognizes that dynamic and efficient staff members dedicated to education are necessary to maintain a constantly improving educational program. The Board is interested in its personnel as individuals, and it recognizes its responsibility for promoting the general welfare of the staff members.~~

~~Duties of these staff members shall be outlined and assigned by the Superintendent.~~

~~Additionally, the Board establishes, as personnel service goals, the following:~~

~~A. Recruiting, selecting, and employing the best-qualified personnel to staff the school system.~~

~~B. An employee appraisal program that will contribute to the continuous improvement of staff performance.~~

~~C. Professional development and in-service training programs for employees that will improve their rates of performance and retention.~~

~~D. Deployment of the available personnel to ensure that they are utilized as effectively as possible within budgetary constraints.~~

~~E. Human relationships necessary to obtain maximum staff performance and satisfaction.~~

~~F. A staff compensation program sufficient to attract and retain qualified employees within the fiscal limitations of the District.~~

~~Adopted: _____~~

~~LEGAL REF.:~~
~~A.R.S.~~
~~15-341~~
~~15-502~~
~~15-503~~

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ADVISORY 962

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~~GENERAL~~ PERSONNEL POLICIES

Personnel Policies

Personnel policies adopted by the Governing Board are to serve as guidelines for the efficient and successful functioning of the District.

The policies are framed and intended to be interpreted within the context of applicable laws and regulations. Changes in the laws and agency rules, as well as in the needs, conditions, purposes, and objectives of the District may result in revisions, deletions, and additions to the policies. Therefore, to the extent permitted or required by law, District personnel policies may be modified, amended, or repealed at any time as the Board determines to be in the best interest of the District.

No person shall be deemed to have a vested right to continuing employment or benefits associated with District employment except as may be required by law and provided in the respective employee's written contract or employment agreement.

Wherever inconsistencies of interpretation arise, the applicable law and regulations will prevail.

Personnel Guidelines

The Board establishes the following guidelines regarding District personnel. The District prioritizes:

A. Recruiting, selecting, and employing the best-qualified personnel to staff the school system.

B. Providing an employee evaluation program that will contribute to the continuous improvement of staff performance.

C. Providing professional development and training programs for employees that will improve their rates of performance and retention.

D. Utilizing available personnel as effectively as possible within budgetary constraints.

F. Offering staff compensation sufficient to attract and retain qualified employees within the fiscal limitations of the District.

G. Encouraging participation in District decision-making.

Adopted: _____

LEGAL REF.:
A.R.S.
15-341
15-342
15-502

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EQUAL EMPLOYMENT OPPORTUNITY AND NON-DISCRIMINATION

~~Discrimination against an otherwise qualified individual with a disability or any individual by reason of~~ The Board is committed to a policy of nondiscrimination in relation to race, color, religion, sex, age, ~~or~~ national origin ~~is prohibited~~, and disability, or any other basis prohibited by law. This policy will prevail in all matters concerning staff members, students, the public, educational programs and services, and individuals with whom the Board does business.

Efforts will be made in recruitment and employment to ensure equal opportunity in employment for all qualified persons, which includes but is not limited to hiring, training, promotion, discipline, compensation, benefits and termination of employment. The District is an equal opportunity employer and complies with all applicable federal, state, and local laws regarding equal employment opportunity and anti-discrimination.

Adopted: _____

LEGAL REF.:
A.R.S.
13-904
15-110
23-341
41-1461 – 41-1468
~~41-1463~~
~~41-1465~~
20 U.S.C. 1681 *et seq*., Title IX of the Education Amendments of 1972 (sex-based discrimination)
29 U.S.C. 206(d), Equal Pay Act of 1963
29 U.S.C. 621 *et seq*., Age Discrimination in Employment Act (ADEA)
29 U.S.C. 701 *et seq*., Rehabilitation Act of 1973
42 U.S.C. 2000c, Title IV of the Civil Rights Act of 1964 (religion)
42 U.S.C. 2000e *et seq*., Title VII of the Civil Rights Act of 1964
42 U.S.C. 2000e(k), Pregnancy Discrimination Act (PDA)
42 U.S.C. 2000gg *et seq*., Pregnant Workers Fairness Act (PWFA)
42 U.S.C. 2000ff *et seq*., Genetic Information Nondiscrimination Act (GINA)
42 U.S.C. 12101 *et seq*., Americans with Disabilities Act (ADA)
Public Law No. 102–166 (codified in multiple sections of 42 U.S.C.), Civil Rights Act of 1991

CROSS REF.:
AC - Nondiscrimination/Equal Opportunity
ACA - Sexual Harassment
IHBA - Special Instructional Programs and Accommodations for Disabled Students

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JB - Equal Educational Opportunities
KED - Public Concerns/Complaints about Facilities or Services

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REGULATION

EQUAL EMPLOYMENT OPPORTUNITY AND NON-DISCRIMINATION

Compliance Officer

The Superintendent shall be the compliance officer. Any person who feels unlawfully discriminated against or to have been the victim of unlawful discrimination by an agent or employee of the District or who knows of such discrimination against another person should file a complaint with the Superintendent. If the Superintendent is the one alleged to have unlawfully discriminated, the complaint shall be filed with the President of the Board.

Complaint Procedure

The District is committed to investigating each complaint and to taking appropriate action on all confirmed violations of policy. The Superintendent shall investigate and document complaints filed pursuant to this regulation as soon as reasonable, within the established timelines. In investigating the complaint, the Superintendent will maintain confidentiality to the extent reasonably possible. The Superintendent shall also investigate incidents of policy violation that are raised by the Governing Board, even though no complaint has been made.

If after the initial investigation the Superintendent has reason to believe that a violation of policy has occurred, the Superintendent shall determine whether or not to hold an administrative hearing and/or to recommend bringing the matter before the Board.

Violations by a Teacher/Administrator

If the person alleged to have violated policy is a teacher or an administrator, the due process provisions of the District's Policy GCQF and Regulation GCQF-RA shall apply, except that the supervising administrator may be assigned to conduct the hearing. In cases of serious misconduct, dismissal or suspension proceedings in accordance with A.R.S. 15-539 *et seq*., may be initiated.

Violations by a Noncertificated Employee

If the person alleged to have violated policy is a ~~support staff~~ noncertificated employee, the Superintendent ~~may~~ will follow ~~due process and impose discipline under Policy GDQD~~ Regulation GCQF-RB as applicable ~~if the evidence so warrants~~. The Superintendent also may recommend a suspension without pay, recommend dismissal, or impose other appropriate discipline.

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Violations by a Student

If the person alleged to have violated policy is a student, the Superintendent may impose discipline in accordance with Policies JK, JKD and JKE.

If the Superintendent's investigation reveals no reasonable cause to believe policy has been violated, the Superintendent shall so inform the complaining party in writing.

~~Timelines~~ Internal Complaint Process

The complaint must be filed within thirty (30) calendar days after the complaining party knew or should have known that there were grounds for a complaint/grievance.

Once the written complaint has been filed using the forms provided by the District, the Superintendent shall require the immediate supervisor or site administrator to investigate and respond in writing to the complaining party within five (5) ~~working~~ business days.

If the immediate supervisor or site administrator does not respond, the Superintendent will have ten (10) additional ~~working~~ business days to respond in writing to the complaining party.

If the Superintendent does not respond within the established time, then the complaining party may request in writing that the issue be brought before the Board. The Board will then review the record of the investigation and have thirty (30) days to respond to the complaining party in writing.

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EXHIBIT

EQUAL EMPLOYMENT OPPORTUNITY
AND NON-DISCRIMINATION

COMPLAINT FORM
(To be filed with the compliance officer as provided in GBA-R)

Please print:

Name _____ Date _____

Address _____

Telephone _____ Another phone where you can be reached _____

During the hours of _____

E-mail address _____

I wish to complain against:

Name of person, school (department), program, or activity _____

_____

_____

Address _____

Specify your complaint by stating the problem as you see it. Describe the incident, the participants, the background to the incident, and any attempts you have made to solve the problem. Be sure to note relevant dates, times, and places.

_____

_____

_____

_____

_____

_____

_____

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If there is anyone who could provide more information regarding this complaint, please list name(s), address(es), and telephone number(s).

Name Address Telephone Number

_____

_____

_____

_____

The projected solution

Indicate what you think can and should be done to solve the problem. Be as specific as possible.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

I certify that this information is correct to the best of my knowledge.

_____

Signature of Complainant

The compliance officer, as designated in GBA-R, shall give one (1) copy to the complainant and shall retain one (1) copy for the file.

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INDIAN PREFERENCE IN EMPLOYMENT

A provision of the 1964 Civil Rights Act allows private and government employers on or near a federal trust Indian reservation to publicly announce and practice a policy giving preferential treatment in hiring to Indian candidates. Indian preference may supersede the equal employment opportunity laws contained in Subchapter VI, Chapter 21 (Civil Rights) of Title 42, U.S. Code.

Therefore, the following exceptions may apply, notwithstanding any other rule, regulation, or policy (e.g., GBA) of the Governing Board.

Indian means, for purposes of the District's Indian Preference in Employment policy, "any person who is presently an enrolled member of a federally recognized tribe."

As used in this policy, the term *Indian preference in employment* shall mean that in the selection process Native American candidates who meet or surpass qualifications for a position shall be given preference for positions established by the Governing Board. The preference standards for each position shall be outlined by the Governing Board prior to opening the position for interested applicants.

The Governing Board may waive any of the above requirements by a formal vote. Such waiver shall apply only to individual employment as determined by the Board on a case-by-case basis. In each case where a waiver of Indian preference occurs, the Board shall make a record of the occurrence, which shall be included in the official minutes of the Board.

Adopted: _____

LEGAL REF.:
~~A.R.S.~~
~~15-502~~
~~41-1463~~
Title VII of Civil Rights Act of 1964; 42 U.S.C. 2000e-2(i)
25 U.S.C. ~~450e~~ 5302
~~42~~ 25 U.S.C. ~~2000e-2(1)~~ 5307

CROSS REF.:
GBA - Equal Employment Opportunity

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~~STAFF INVOLVEMENT IN DECISION MAKING~~

~~It shall be the policy of the Board to encourage employee participation in the decision making for the District. The Superintendent is authorized to establish such committees as necessary to recommend policies and regulations that will enhance the operation of the District.~~

~~In recommending policies to the Board and in the development of regulations for the operation of the District, the Superintendent may involve at the planning stage, whenever feasible, any employees who may be affected by such provisions.~~

~~The Superintendent shall establish, with certificated and support staff employees, channels for the ready intercommunication of ideas and feelings regarding the operation of the schools. The Superintendent shall weigh with care the counsel given by employees and inform the Board of such counsel in presenting recommendations for Board action.~~

~~Adopted: _____~~

~~LEGAL REF.:~~
~~A.R.S.~~
~~15-321~~

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~~STAFF~~ ETHICS AND CODE OF CONDUCT

~~(Statement of Ethics for School Employees)~~

All employees of the District are expected to ~~maintain high standards in their school relationships. These standards must be idealistic and at the same time practical, so that they can apply reasonably to all staff members. The employees acknowledge that the schools belong to the public they serve for the purpose of providing educational opportunities to all. However, every employee assumes responsibility for providing leadership in the school and community. This responsibility requires the employee to maintain standards of exemplary conduct. It must be recognized that the employee's actions will be viewed and appraised by the community, associates, and students. To these ends, the Board adopts the following statements of standards~~ conduct themselves in a manner consistent with effective and orderly education and to protect students and District property. No employee shall, by action or inaction, interfere with or disrupt any District activity or encourage any such disruption. All employees shall at all times attempt to maintain order, abide by the policies, rules, and regulations of the District, and carry out all applicable orders issued by the Superintendent.

All employees of the District are expected to maintain high professional standards in their professional capacities. Therefore, the Board adopts the following Code of Conduct standards to which all employees are expected to comply.

Code of Conduct

The school employee:

A. Makes the well-being of students the fundamental ~~value~~ basis of all decision making and actions.

B. Maintains ~~just~~ fair, courteous, and ~~proper~~ professional relationships with students, parents, staff members, and other~~s~~ community members.

C. ~~Strives for the maintenance of efficiency and knowledge of developments in the employee's field of work~~ Protects students from harmful conditions related to health, well-being or safety as is reasonably practicable.

D. Fulfills job responsibilities with honesty and integrity.

E. ~~Directs any criticism of other staff members or of any department of the school system toward improving the District. Such constructive criticism is to be made directly to the school administrator who has the responsibility for improving the situation~~ Supports the principle of due process and protects the civil and human rights of all individuals, as reasonably practicable.

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~~F. Supports the principle of due process and protects the civil and human rights of all individuals.~~

F. ~~G.~~ Obeys local, state, and ~~national~~ federal laws ~~and does not knowingly join or support organizations that advocate, directly or indirectly, the overthrow of the government~~.

G. ~~H.~~ Implements the Governing Board's policies and administrative rules and regulations.

H. ~~I.~~ Refrains from using school contacts and privileges to promote political or sectarian religious views or personal agenda of any kind.

~~J. Pursues appropriate measures to correct any laws, policies, or regulations that are not consistent with sound educational goals.~~

I. ~~K.~~ Avoids using position for personal gain through political, social, religious, economic, or other influence.

J. ~~L.~~ Maintains the standards and seeks to improve the effectiveness of the profession through research and continuing professional development.

K. ~~M.~~ Stresses the proper use and protection of all school properties, equipment~~,~~ and materials.

L. ~~N.~~ Honors all contracts until fulfillment or release.

M. Maintains confidentiality in the performance of duties, unless disclosure serves legitimate District purposes or is required by law.

~~In the performance of duties, employees shall keep in confidence such information as they may secure unless disclosure serves District purposes or is required by law.~~

Consequences

Potential consequences to employees of the District who violate these rules may include, but are not limited to:

A. Warning.

B. Reprimand.

C. Removal from school grounds.

D. Suspension.

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E. Dismissal.

F. Having consideration given to any such violations in the determination of or establishment of any pay or salary in later contracts or employment, if any.

G. Applicable civil and criminal sanctions/penalties.

Adopted: _____

LEGAL REF.:
A.R.S.
15-203(23)
15-505
A.A.C.
R7-2-205
R7-2-1301 – R7-2-1309
18 U.S.C. 2385

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REGULATION

ETHICS AND CODE OF CONDUCT

(Prohibited Conduct)

No employee, while on or using school property, otherwise acting as an agent, or working in an official capacity for the District shall engage in:

A. Physical or verbal abuse of, or threat of harm to, anyone.

B. Causing damage, or threat of damage, to any property located on any premises controlled by the District.

C. Unauthorized entry to or occupation of District facilities, including buildings and grounds.

D. Use, possession, distribution, or sale of alcohol or of drugs or other illegal substances.

E. Use of profane or abusive language, symbols, or conduct.

F. Failure to comply with lawful direction of District officials, security officers, or any other law-enforcement officer, or failure to identify oneself to such officials or officers when lawfully requested to do so.

G. The carrying or possession of a weapon on school grounds without authorization from the appropriate school administrator.

H. A violation of District policies and regulations.

I. Any conduct violating federal, state, or applicable local law or regulation.

J. Any other conduct that may obstruct, disrupt, or interfere with teaching, research, service, administrative, or disciplinary functions of the District, or any other activity sponsored or approved by the Board.

K. The use of District resources, as defined in A.R.S. 15-511 and District Policy GBI, Participation in Political Activities, to influence the outcome of an election.

L. Inappropriate personal relationships with students, including romantic or sexual conduct.

M. Improper or unauthorized use of restraint and seclusion techniques, in violation of A.R.S. 15-105 or District Policy JLDB.

Violations shall be considered serious and may result in significant disciplinary action.

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EXHIBIT

ETHICS AND CODE OF CONDUCT

NOTIFICATION CONCERNING NONAPPEALABLE OFFENSES

Notice is herein provided, in accordance with A.R.S. 15-550, that any employee of a public school district or charter school in this state who is arrested for or charged with one (1) or more of the offenses listed below as nonappealable offenses precluding that person from receiving a fingerprint clearance card shall immediately report the arrest or charge to the person's supervisor or the person shall be immediately dismissed from employment with the public school district or charter school. A person dismissed from employment for failure to report being arrested for or charged with a nonappealable offense has no right to appeal under the provisions of A.R.S. 15-539, subsection F.

1. Sexual abuse of a vulnerable adult.
2. Incest.
3. First or second degree murder.
4. Sexual assault.
5. Sexual exploitation of a minor.
6. Sexual exploitation of a vulnerable adult.
7. Commercial sexual exploitation of a minor.
8. Commercial sexual exploitation of a vulnerable adult.
9. Child prostitution as prescribed in section 13-3212.
10. Child abuse.
11. Abuse of a vulnerable adult.
12. Sexual conduct with a minor.
13. Molestation of a child.
14. Molestation of a vulnerable adult.
15. A dangerous crime against children as defined in section 13-705.

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16. Exploitation of minors involving drug offenses.
17. Taking a child for the purpose of prostitution as prescribed in section 13-3206.
18. Neglect or abuse of a vulnerable adult.
19. Sex trafficking.
20. Sexual abuse.
21. Production, publication, sale, possession and presentation of obscene items as prescribed in section 13-3502.
22. Furnishing harmful items to minors as prescribed in section 13-3506.
23. Furnishing harmful items to minors by internet activity as prescribed in section 13-3506.01.
24. Obscene or indecent telephone communications to minors for commercial purposes as prescribed in section 13-3512.
25. Luring a minor for sexual exploitation.
26. Enticement of persons for purposes of prostitution.
27. Procurement by false pretenses of person for purposes of prostitution.
28. Procuring or placing persons in a house of prostitution.
29. Receiving earnings of a prostitute.
30. Causing one's spouse to become a prostitute.
31. Detention of persons in a house of prostitution for debt.
32. Keeping or residing in a house of prostitution or employment in prostitution.
33. Pandering.
34. Transporting persons for the purpose of prostitution, polygamy and concubinage.
35. Portraying adult as a minor as prescribed in section 13-3555.
36. Admitting minors to public displays of sexual conduct as prescribed in section 13-3558.
37. Unlawful sale or purchase of children.
38. Child bigamy.

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Further, an employee who is convicted of one (1) or more of the above listed offenses shall immediately:

A. Surrender any certificates issued by the Department of Education.

B. Notify the person's employer or potential employer of the conviction.

C. Notify the Department of Public Safety of the conviction.

D. Surrender the person's fingerprint clearance card.

By my signature I acknowledge receipt of a copy of this notification concerning nonappealable offenses.

_____ _____

Employee signature Date

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~~STAFF~~ CONFLICT OF INTEREST

Employment of Close Relatives

~~No person employed by the District may be directly supervised by a close relative (father, mother, son, daughter, sister, brother, or spouse).~~ The Superintendent, Principals, or other administrators with hiring authority may not participate in the hiring of any person related to them within the third degree of consanguinity, affinity, or by law, and no District employee shall be placed in a position where they directly supervise or are directly supervised by such a relative.

No dependent, as defined in A.R.S. 43-1001 (see also Internal Revenue Code 26 U.S.C. 152), of a Governing Board member may be employed in the District, except by consent of the Board in accordance with A.R.S. 15-502. Small school Districts, as defined by A.R.S. 15-901, are granted an exception regarding employment of substitute teachers. A.R.S. 15-421(E).

This policy will apply for summer or part-time work as well as for full-time employment.

~~A dependent of a Board member (a person more than half of whose support is obtained from a Board member) cannot be hired in the District except by consent of the Board. The spouse of a Board member cannot be employed by the District.~~

Business Relations

Any Governing Board member, administrator, or employee who has, or whose relative has, a substantial interest in any ~~decision of~~ contract, sale, purchase, or service to the District shall make known ~~this~~ that interest in the official records of the District, and shall refrain from participating in any manner as an employee in such ~~a decision~~ contract, sale, or purchase, as provided in A.R.S. 38-501, 38-502 and 38-503.

Refrain from participating in any manner means more than just refraining from making a final decision. It means participating in any way in the process leading up to a decision. A~~n~~ Governing Board member, administrator, or employee with a conflict of interest must not make recommendations, give advice, or otherwise communicate in any manner with anyone involved in the decision-making process.

Vendor Relations

No employee of the District will accept a gift or benefit from any person, group, or entity doing, or desiring to do, business with the District as described in Policy DJ, ~~Purchasing (~~Purchasing Ethics ~~Policy)~~.

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District Purchases from Employees

The District must comply with competitive purchasing rules for any acquisition of goods or services from District employees regardless of the dollar amount. The District may only acquire equipment, material, supplies, or services from its employees ~~only~~ under an award or contract ~~let~~ after public competitive bidding ~~[~~(A.R.S. 38-503; A.G.O. I06-002~~]~~). The requirement applies to any purchase using District monies, including extracurricular activities fees, tax credit contributions, and monies held in trust by the District such as student activities monies, when a District employee acts as the vendor. ~~Oral and written quotations do not satisfy the public competitive bidding requirements.~~

Employee ~~Training~~ Guidance and Acknowledgement of Understanding

The ~~Governing Board may require annual employee training to ensure District conflict of interest policies are communicated to employees and acknowledged as received and understood. Each employee shall~~ District shall annually provide written guidance to all employees regarding what constitutes a substantial interest, and each employee shall annually complete and sign the District's conflict-of-interest disclosure form, (GBEAA-E)~~, as determined by the District~~. Evidence of the guidance provided and signed disclosure forms shall be maintained by the District in compliance with the Uniform System of Financial Records (USFR), and all disclosures shall be kept on file for public inspection as required by A.R.S. 38-509.

Investigations

The District will investigate allegations of inadequate disclosure of substantial interests and/or inappropriate participation when a substantial interest may exist.

Adopted: _____

LEGAL REF.:
A.R.S.
15-213
15-323
15-421
15-502
38-481
38-501 ~~*et seq.*~~- 38-511 (Title 38, Chapter 3, Article 8)
~~38-502~~
~~38-503~~
43-1001

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A.G.O.
I82-004
I83-093
I83-111
I00-013
I03-005
I06-002
Attorney General Arizona Agency Handbook, Chapter 8, Appendix 8.1, Conflict of Interest Disclosure Memorandum
Uniform System of Financial Records
26 U.S.C. 152

CROSS REF.:
BCB - Board Member Conflict of Interest
DJ – Purchasing Ethics
DJE - Bidding/Purchasing Procedures
GBP - ~~Prohibited Personnel Practices~~ Reprisals

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EXHIBIT

~~STAFF~~ CONFLICT OF INTEREST

CONFLICT OF INTEREST DISCLOSURE PURSUANT TO A.R.S. §§ 38-501 to 38-511

(Instructions)

1. Employees must file a Conflict-of-Interest Disclosure within five (5) calendar days after commencing work and at least annually thereafter, either identifying any ~~conflict~~ substantial interest the employee or the employee's relative has or stating that neither the employee nor the employee's relative has ~~no conflict~~ any substantial interest requiring disclosure.

2. All Conflict-of-Interest Disclosures shall be ~~kept on~~ filed ~~at~~ with _____ [*name District location/department*] and maintained in the District's official records in accordance with law.

3. It is the employee's responsibility to update and submit ~~to both District Legal and Human Resources Departments~~ a revised Disclosure to the location/department noted above within fifteen (15) calendar days ~~of~~ after any new ~~conflict~~ substantial interest aris~~ing~~es ~~after~~ following the date of the most recent Disclosure.

STATEMENT OF CONFLICT

I, _____, do hereby indicate:

1. That I am presently an employee of the _____ School District;

2. That I (or my relative[s]: _____) have a substantial interest in the contract, sale, purchase, decision, investigation, or other matter by the _____ Governing Board as described below.

Identify the contract, sale, purchase, service, decision, investigation, or other matter in which you or your relative may have a "substantial interest" under A.R.S. §§ 38-501 to 38-511. (Use as much space as necessary)

Describe the "substantial interest" referred to above. (Use as much space as necessary)

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STATEMENT OF DISQUALIFICATION
To be completed if you have a conflict as identified above.

To avoid any possible conflict of interest under A.R.S. ~~§§~~ 38-501 to 38-511, I will refrain from participating in any manner in the matter identified above.

_____ _____
Date Signature

STATEMENT OF NO CONFLICT
To be completed only if neither you ~~do not~~ nor your relative ~~does not have a conflict of~~ has a substantial interest requiring disclosure.

I, _____, do hereby indicate that I do not have, and none of my relatives has, a substantial interest in any contract, sale, purchase, service, decision, investigation, or other matter of the _____ School District.

_____ _____
Date Signature

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ADVISORY 968

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~~GBEB ©~~
~~STAFF CONDUCT~~

~~All employees of the District are expected to conduct themselves in a manner consistent with effective and orderly education and to protect students and District property. No employee shall, by action or inaction, interfere with or disrupt any District activity or encourage any such disruption. No employee, other than one who has obtained authorization from the appropriate school administrator, shall carry or possess a weapon on school grounds. All employees shall at all times attempt to maintain order, abide by the policies, rules, and regulations of the District, and carry out all applicable orders issued by the Superintendent.~~

~~Potential consequences to employees of the District who violate these rules may include, but are not limited to:~~

~~A. Removal from school grounds.~~

~~B. Both civil and criminal sanctions, which may include, but are not limited to, criminal proceedings under Title 13, Chapter 29, Arizona Revised Statutes.~~

~~C. Warning.~~

~~D. Reprimand.~~

~~E. Suspension.~~

~~F. Dismissal.~~

~~G. Having consideration given to any such violations in the determination of or establishment of any pay or salary in later contracts or employment, if any.~~

~~Reporting Suspected Crimes or Incidents~~

~~Staff members are to report any suspected crime against a person or property that is a serious offense, involves a deadly weapon or dangerous instrument or that could pose a threat of death or serious injury and any conduct that poses a threat of death or serious physical injury to employees, students or others on school property. All such reports shall be documented and communicated to the Superintendent who shall be responsible for reporting to local law enforcement. Conduct that is considered to be bullying, harassment or intimidation shall be addressed according to Policy JICK as required in A.R.S. 15-341(A)(36).~~

~~The school district or charter school is to notify the parent or guardian of each student who is involved in a suspected crime or any conduct that is described above, subject to the requirements of federal law.~~

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~~On or before January 1, 2020, the District shall post the policies and procedures pertaining to "Reporting Suspected Crimes or Incidents" on its website as the Department of Education shall develop a process to verify that each school district has adopted the required policies and procedures by this date.~~

~~If the District maintains an online Manual of policies and procedures, the District may post a link to that manual with a reference to the appropriate policies and procedures.~~

~~A person who violates the reporting requirements may be disciplined for violating the policies of the School District Governing Board pursuant to A.R.S. 15-341 and notwithstanding A.R.S. 15-341, may be subject to dismissal. Each school district governing board shall prescribe and enforce policies and procedures that require the School District to maintain a record on any person who is disciplined pursuant to this policy and, on request, shall make that record available to any public school, school district governing board or charter school governing body that is considering hiring that person.~~

~~A person who is employed by the School District or is an applicant for employment with the School District, who is arrested for or charged with any nonappealable offense listed in section 41-1758.03, subsection B and who does not immediately report the arrest or charge to the person's supervisor or potential employer is guilty of unprofessional conduct and the person shall be immediately dismissed from employment with the School District or immediately excluded from potential employment with the School District. A person dismissed from employment for failure to report being arrested for or charged with a nonappealable offense has no right to appeal under the provisions of A.R.S. 15-539, subsection F. Prior to an action to terminate for failure to report, an employee will be given the opportunity to provide a written explanation of circumstances or events which they believe mitigate the failure to report.~~

~~Use of Physical Force by Supervisory Personnel~~

~~Any administrator, teacher, or other school employee entrusted with the care and supervision of a minor may use reasonable and appropriate physical force upon the minor to the extent reasonably necessary and appropriate to maintain order. Similar physical force will be appropriate in self-defense, in the defense of other students and school personnel, and to prevent or terminate the commission of theft or criminal damage to the property of the District or the property of persons lawfully on the premises of the District.~~

~~The threat or use of physical force is not justified as a response to verbal provocation alone, nor when the degree of physical force used is disproportionate to the circumstances or exceeds that necessary to avoid injury to oneself or to others or to preserve property at risk.~~

~~Adopted: _____~~

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~~LEGAL REF.:~~
~~A.R.S.~~
~~13-2911~~
~~13-3102~~
~~13-3111~~
~~13-3411~~
~~15-153~~
~~15-341~~
~~15-342~~
~~15-507~~
~~15-509~~
~~15-511~~
~~15-512~~
~~15-514~~
~~15-539~~
~~15-550~~
~~38-531~~
~~38-532~~
~~41-770~~
~~41-1758.03~~
~~A.A.C.~~
~~R7-2-205~~

~~CROSS REF.:~~
~~GCF - Professional Staff Hiring~~
~~GCMF - Professional Staff Duties and Responsibilities~~
~~GCO - Evaluation of Professional Staff Members~~
~~JIC - Student Conduct~~
~~JK - Student Discipline~~
~~KFA - Public Conduct on School Property~~

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~~REGULATION~~

~~STAFF CONDUCT~~

~~No employee, while on or using school property, otherwise acting as an agent, or working in an official capacity for the District shall engage in:~~

~~A. Physical or verbal abuse of, or threat of harm to, anyone.~~

~~B. Causing damage, or threat of damage, to property of the District or property of a member of the community or a visitor to the school when the property is located on premises controlled by the District.~~

~~C. Forceful or unauthorized entry to or occupation of District facilities, including buildings and grounds.~~

~~D. Use, possession, distribution, or sale of alcohol or of drugs or other illegal substances.~~

~~E. Use of profane or abusive language, symbols, or conduct.~~

~~F. Failure to comply with lawful direction of District officials, security officers, or any other law-enforcement officer, or failure to identify oneself to such officials or officers when lawfully requested to do so.~~

~~G. The carrying or possession of a weapon on school grounds without authorization from the appropriate school administrator.~~

~~H. A violation of District policies and regulations.~~

~~I. Any conduct violating federal, state, or applicable municipal law or regulation.~~

~~J. Any other conduct that may obstruct, disrupt, or interfere with teaching, research, service, administrative, or disciplinary functions of the District, or any other activity sponsored or approved by the Board.~~

~~K. The use of District resources, as defined in A.R.S. 15-511 and District Policy GBI, Staff Participation in Political Activities, to influence the outcome of an election.~~

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~~In addition to the foregoing, all staff members are expected to:~~

~~A. Thoroughly acquaint themselves with the rules, regulations, and other information applicable to them contained within the policies of the Board.~~

~~B. Conduct themselves in a manner consistent with effective and orderly education and to protect the students and the District property.~~

~~C. Maintain order in a manner consistent with District policies and regulations.~~

~~D. Comply promptly with all orders of the Superintendent and the administrator who is their immediate supervisor.~~

~~E. Dress and maintain a general appearance that reflects their position and does not detract from the educational program of the school.~~

~~F. Comply with the requirement of A.R.S. 15-153 and 15-515 by immediately reporting to the Superintendent or the administrator who is their immediate supervisor:~~

~~1. A violation of A.R.S. 13-3102 [possession of a deadly weapon on school grounds].~~

~~2. A violation of A.R.S. 13-3111 [possession of a firearm by a minor without authorization (in Maricopa and Pima Counties and where otherwise adopted by local ordinance)].~~

~~3. A violation of A.R.S. 13-3411 [possession, use, or intent to sell marijuana, peyote, or dangerous or narcotic drugs, or intent to sell prescription-only drugs in a drug-free school zone (i.e., school grounds and the area within three hundred [300] feet and public property within one thousand [1,000] feet of school grounds, the area at a school bus stop, and a school bus)].~~

~~Any administrator receiving a report of a violation of A.R.S. 13-3102, 13-3111, or 13-3411 shall immediately report such violation to a peace officer in compliance with A.R.S. 15-153 and 15-515.~~

~~Employees of the District who violate these rules are subject to disciplinary action.~~

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~~EXHIBIT~~

~~STAFF CONDUCT~~

~~NOTIFICATION CONCERNING NONAPPEALABLE OFFENSES~~

~~Notice is herein provided, in accordance with A.R.S. 15-550, that any employee of a public school district or charter school in this state who is arrested for or charged with one (1) or more of the offenses listed below as nonappealable offenses precluding that person from receiving a fingerprint clearance card shall immediately report the arrest or charge to the person's supervisor or the person shall be immediately dismissed from employment with the public school district or charter school. A person dismissed from employment for failure to report being arrested for or charged with a nonappealable offense has no right to appeal under the provisions of A.R.S. 15-539, subsection F.~~

1. ~~Sexual abuse of a vulnerable adult.~~
2. ~~Incest.~~
3. ~~First or second degree murder.~~
4. ~~Sexual assault.~~
5. ~~Sexual exploitation of a minor.~~
6. ~~Sexual exploitation of a vulnerable adult.~~
7. ~~Commercial sexual exploitation of a minor.~~
8. ~~Commercial sexual exploitation of a vulnerable adult.~~
9. ~~Child prostitution as prescribed in section 13-3212.~~
10. ~~Child abuse.~~
11. ~~Abuse of a vulnerable adult.~~
12. ~~Sexual conduct with a minor.~~
13. ~~Molestation of a child.~~
14. ~~Molestation of a vulnerable adult.~~
15. ~~A dangerous crime against children as defined in section 13-705.~~
16. ~~Exploitation of minors involving drug offenses.~~

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~~17. Taking a child for the purpose of prostitution as prescribed in section 13-3206.~~

~~18. Neglect or abuse of a vulnerable adult.~~

~~19. Sex trafficking.~~

~~20. Sexual abuse.~~

~~21. Production, publication, sale, possession and presentation of obscene items as prescribed in section 13-3502.~~

~~22. Furnishing harmful items to minors as prescribed in section 13-3506.~~

~~23. Furnishing harmful items to minors by internet activity as prescribed in section 13-3506.01.~~

~~24. Obscene or indecent telephone communications to minors for commercial purposes as prescribed in section 13-3512.~~

~~25. Luring a minor for sexual exploitation.~~

~~26. Enticement of persons for purposes of prostitution.~~

~~27. Procurement by false pretenses of person for purposes of prostitution.~~

~~28. Procuring or placing persons in a house of prostitution.~~

~~29. Receiving earnings of a prostitute.~~

~~30. Causing one's spouse to become a prostitute.~~

~~31. Detention of persons in a house of prostitution for debt.~~

~~32. Keeping or residing in a house of prostitution or employment in prostitution.~~

~~33. Pandering.~~

~~34. Transporting persons for the purpose of prostitution, polygamy and concubinage.~~

~~35. Portraying adult as a minor as prescribed in section 13-3555.~~

~~36. Admitting minors to public displays of sexual conduct as prescribed in section 13-3558.~~

~~37. Unlawful sale or purchase of children.~~

~~38. Child bigamy.~~

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~~Further, an employee who is convicted of one (1) or more of the above listed offenses shall immediately:~~

~~A. Surrender any certificates issued by the department of education.~~

~~B. Notify the person's employer or potential employer of the conviction.~~

~~C. Notify the department of public safety of the conviction.~~

~~D. Surrender the person's fingerprint clearance card.~~

~~By my signature I acknowledge receipt of a copy of this notification concerning nonappealable offenses.~~

_____ _____

~~Employee signature~~ ~~Date~~

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ADVISORY 969

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~~STAFF~~ CONDUCT WITH STUDENTS

District ~~E~~employees are expected to ~~exercise general supervision over the conduct of students, not only while in the schoolroom, but also~~ maintain professional relationships with students at all times, including social media interactions. Expected behaviors include but are not limited to:

A. Supervise student conduct during the school day, before and after school and during recess.

B. Treat students with ~~At all times teachers and other staff members will accord students the~~ dignity and respect, avoiding embarrassment or humiliation ~~that they deserve, and avoid embarrassing any student unnecessarily~~.

~~Students are expected to regard all school employees as individuals who are employed to provide direct or indirect contributions to learning. While students are to have considerable latitude in making choices for themselves, they shall be required to respect the rights of all school employees and other students, and interference with those rights will not be tolerated.~~

~~Students shall not have the right to interfere with the efforts of instructional staff members to coordinate or assist in learning, to disseminate information for purposes of learning, or to otherwise implement a learning program. Nor shall a student have the right to interfere with the motivation to learn or the learning activities and efforts of other students. No student shall have the right to interfere with or disrupt any employee's work activities.~~

~~All personnel employed by the District are expected to relate to students of the District in a manner that maintains social and moral patterns of~~

C. Model social, moral, and professional behavior consistent with community standards and ~~acceptable professional conduct~~ District policy.

D. Abstain from any conduct that violates ethical or professional standards under law or policy.

E. Abstain from romantic or sexual conduct with students.

F. Comply with state law (A.R.S. 15-105) and Board Policy JLDB regarding the use of restraint and seclusion techniques.

~~Relationships between staff members and students that include "dating," "courtship," or "romantic involvement" are prohibited. These behaviors deviate from ethical or professional standards and shall be deemed unacceptable and contrary to the expectations of District governance.~~

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~~Staff/student relationships shall reflect mutual respect between staff members and students and shall support the dignity of the entire profession and educational process.~~

Violations of ~~the above~~ this policy shall be considered serious and may result in severe disciplinary action.

Adopted: _____

LEGAL REF.:
A.R.S.
13-1401
13-1405
~~15-321~~
15-341
15-514

CROSS REF.:
JIC - Student Conduct

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ADVISORY 970

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GIFTS TO AND SOLICITATIONS
BY EMPLOYEES ~~STAFF MEMBERS~~

Gifts to Employees

~~Students, parents, and other patrons of the District shall be discouraged from the routine presentation of gifts~~ The District discourages the routine giving of gifts from students, parents, or other community members to employees. This ~~shall~~ provision is not ~~be interpreted as~~ intended to ~~discourage~~ prevent acts of generosity in ~~unusual situations~~ exceptional circumstances, and ~~simple remembrances expressive of affection~~ modest tokens of appreciation or gratitude shall not be ~~regarded as~~ considered violations of this policy.

Gifts to Students

~~Gifts to students by staff members shall be discouraged. Simple remembrances on certain occasions~~ Staff members are discouraged from giving gifts to individual students. However, small tokens presented to all students in a class or ~~section~~ group on special occasions shall not be regarded as a violation of this policy.

Solicitations

~~A school employee's position in the District shall not be used~~ Employees shall not use their District position to influence parents or students to purchase books or other merchandise, except for materials approved by the Superintendent for classroom use ~~in the classroom~~. ~~Staff member~~ Any solicitation~~(s)~~ of ~~other~~ employees ~~and/~~or students, whether for ~~any~~ profit, nonprofit, or charitable ~~groups, institutions, or organizations must have the~~ purposes, requires prior approval ~~of~~ from the Superintendent ~~in advance~~. No other solicitations ~~shall be made~~ by or of employees are permitted during official duty ~~time~~ hours.

Adopted: _____

LEGAL REF.:
A.R.S.
~~15-321~~
15-341

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ADVISORY 971

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ALCOHOL AND DRUG – FREE WORKPLACE

No employee shall violate the law or District policy in the manufacture, distribution, purchasing, dispensing, possession, or use, on or in the workplace, of alcohol or any dangerous drug, narcotic drug, hallucinogenic drug, amphetamine, barbiturate, marijuana, precursor chemical or any other controlled substance, as defined in schedules I through V of section 202 of the Controlled Substances Act (21 U.S.C. 812) and as further defined by regulation at 21 C.F.R. 1308.11 through 1308.15.

Alcohol or Illegal Drugs

Prohibitions

The use or possession of intoxicants on District property or at District-sponsored activities is prohibited.

Violations

Any person in violation of the provisions of this policy shall be subject to removal from school property and shall be subject to prosecution in accordance with the provisions of the law.

Staff members of the District who are in violation of the provisions of this policy shall be subject to disciplinary actions in accordance with the provisions of school regulations.

A staff member who apparently has consumed alcoholic beverages or illegal drugs on or off school property and/or before a school activity will not be allowed to be on school property or to participate in school activities. Staff members who violate this policy will be subject to the same penalties as for possession and/or consumption on school property.

Exceptions

This policy does not prohibit the following:

A. A District employee while at a District workplace may possess alcohol in an unopened container in a locked, personal motor vehicle as long as the container cannot be viewed from outside the vehicle.

B. A District employee who, pursuant to local conditions or an employment contract with the District, resides on District property or resides in District housing may possess and use alcohol at the employee's residence subject to the following restrictions:

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1. The employee shall not possess (except for possession at said residence), sell, offer to sell, transfer, use, or be under the influence of alcohol while on duty.

2. Any alcohol consumption that occurs on school property when the employee is not on duty shall be done in moderation and shall occur within the employee's residence.

Medical Marijuana

The District recognizes Arizona's medical marijuana law and shall not discriminate against a person in hiring, termination or imposition of any term or condition of employment or otherwise penalize a person on the basis of the person's status as an eligible medical marijuana cardholder, or as a registered qualifying patient, having a positive drug test for marijuana components or metabolites, unless the person used, possessed or was impaired by marijuana on District property, at a District event, or during the hours of the person's regular or extended hours of employment, or as proscribed by law.

Definitions

In addition to being defined in schedules I through V of section 202 of the Controlled Substances Act (21 U.S.C. 812) and 21 C.F.R. 1308.11 through 1308.15, "dangerous drug," "narcotic drugs," "marijuana," and "precursor chemical" are also defined in A.R.S. 13-3401.

"Alcohol" means beer, wine, spiritous liquor or any distilled spirits as defined in A.R.S. 4-101.

Workplace includes any school building or any school premises and any school-owned vehicle or any other school-approved vehicle used to transport staff members or students to and from school or school activities or on school business. Off school property, the *workplace* includes any school-sponsored or school-approved activity, event, or function where students or staff members are under the jurisdiction of the District. In addition, the *workplace* shall include all property owned, leased, or used by the District for any educational or District business purpose.

Process After Violation

As a condition of employment, each employee shall abide by the terms of the District policy respecting a drug-free workplace.

The nonmedical use, abuse, or possession of drugs and/or use or possession of alcohol is forbidden on District property or at District-sponsored activities. Employees determined to be in possession of, using, or abusing drugs or alcohol shall be reported immediately to the employee's principal or supervisor. The Superintendent shall be notified immediately.

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The Superintendent shall conduct an investigation in consultation with legal counsel as necessary. Employees that violate this policy may be disciplined up to and including termination. If the investigation shows sufficient evidence to suggest that the employee was involved with distribution or otherwise in violation of the law, law enforcement authorities shall be notified.

Reporting

Any employee who has been convicted under any criminal drug statute for a violation occurring in the workplace, as defined above, shall notify their supervisor within five (5) calendar days thereof that such conviction has occurred.

~~As a condition of employment, each employee shall abide by the terms of the District policy respecting a drug-free workplace.~~

~~Any employee who violates this policy in any manner is subject to discipline, which may include, but is not limited to, dismissal.~~

Adopted: _____

LEGAL REF.:
A.R.S.
4-101
~~13-2911~~
13-3401 *et seq*.
15-341
36-2801 *et seq*., Arizona Medical Marijuana Act
41 U.S.C. 8101 *et seq*. ~~702~~, Drug-free workplace requirements for Federal grant recipients
21 C.F.R. 1308.11 *et seq*.
34 C.F.R. Part 84~~5~~

CROSS REF.:
EEAEA~~A~~ – Bus Driver Requirements, Training, and Responsibilities ~~Drug and Alcohol Testing of Transportation Employees~~

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GBEC-R ©

REGULATION

ALCOHOL AND DRUG – FREE WORKPLACE

In order to comply with federal funding requirements, the District shall:

A. Gather information relative to availability of local community drug and alcohol counseling, rehabilitation, and reentry programs that are available to employees and make such information available to employees.

B. Provide each employee a copy of standards of conduct and the statement of disciplinary sanctions that apply to alcohol and drug violations. Use Exhibit GBEC-E to notify employees that compliance with such standards is mandatory.

The District should perform a biennial review of the programs to:

A. Ensure that disciplinary sanctions for employees are consistently enforced.

B. Determine program effectiveness and implement change to the program if needed.

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GBEC-E ©

EXHIBIT

ALCOHOL AND DRUG – FREE WORKPLACE

NOTICE TO EMPLOYEES

YOU ARE HEREBY NOTIFIED that it is a violation of Policy GBEC for any employee to violate the law or District policy in the manufacture, distribution, purchasing, dispensing, possession, or use, on or in the workplace, of alcohol or any dangerous drug, narcotic drug, hallucinogenic drug, amphetamine, barbiturate, marijuana, precursor chemical, or any other controlled substance, as defined in schedules I through V of section 202 of the Controlled Substances Act (21 U.S.C. 812) and as further defined by regulation at 21 C~~.~~F~~.~~R~~.~~ 1308.11 through 1308.15.

Workplace includes any school building or any school premises and any school-owned vehicle or any other school-approved vehicle used to transport staff members or students to and from school or school activities or on school business. Off school property, the *workplace* includes any school-sponsored or school-approved activity, event, or function where students or staff members are under the jurisdiction of the District. In addition, the *workplace* shall include all property owned, leased, or used by the District for any educational or District business purpose.

YOU ARE FURTHER NOTIFIED that it is a condition of your employment that you will comply with Policy GBEC, and will notify your supervisor in writing of your conviction under any criminal drug statute for a violation occurring in the workplace, no~~t~~ later than five (5) calendar days after such conviction.

Any employee who violates the terms of the District's alcohol and drug-free workplace policy in any manner is subject to discipline, which may include, but is not limited to, dismissal and/or referral for prosecution.

- -

I have been provided with two (2) copies of this **Notice to Employees** for my review and signature. I understand that a signed copy will be placed in my personnel file.

____________________________________ ____________________

Signature Date

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ADVISORY 972

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~~GBECA ©~~
~~NONMEDICAL USE OR ABUSE OF DRUGS OR ALCOHOL~~

~~Employee Drug Use, Abuse or Possession~~

~~The nonmedical use, abuse, or possession of drugs and/or use or possession of alcohol is forbidden on District property or at District-sponsored activities. Employees determined to be in possession of, using, or abusing drugs or alcohol shall be reported immediately to the employee's principal or supervisor. The Superintendent shall be notified immediately.~~

~~The Superintendent shall conduct an investigation in consultation with legal counsel as necessary. Employees that violate this policy may be disciplined up to and including termination. If the investigation shows sufficient evidence to suggest that the employee was involved with distribution or otherwise in violation of the law, law enforcement authorities shall be notified.~~

~~Medical Marijuana~~

~~The District recognizes Arizona's medical marijuana law and shall not discriminate against a person in hiring, termination or imposition of any term or condition of employment or otherwise penalize a person on the basis of the person's status as an eligible medical marijuana cardholder, or as a registered qualifying patient, having a positive drug test for marijuana components or metabolites, unless the person used, possessed or was impaired by marijuana on District property, at a District event, or during the hours of the persons regular or extended hours of employment, or as prescribed by law.~~

~~Adopted: _____~~

~~LEGAL REF.:~~
~~A.R.S.~~
~~13-2911~~
~~13-3401 *et seq.*~~
~~15-341~~
~~23-493~~
~~23-493.03~~
~~36-2801 *et seq.*~~
~~41 U.S.C. 702, Drug-free workplace requirements for Federal grant recipients~~
~~34 C.F.R. Part 85~~

~~CROSS REF.:~~
~~EEAEAA - Drug and Alcohol Testing of Transportation Employees~~

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ADVISORY 973

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~~GBECB ©~~
~~ALCOHOL USE BY STAFF MEMBERS~~

~~(Illegal Drugs)~~

~~The use or possession of intoxicants or illegal drugs on school property or at school events is prohibited.~~

~~Any person in violation of the provisions of the above paragraph shall be subject to removal from school property and shall be subject to prosecution in accordance with the provisions of the law.~~

~~Staff members of the District who are in violation of the provisions of this policy shall be subject to disciplinary actions in accordance with the provisions of school regulations.~~

~~A staff member who apparently has consumed alcoholic beverages or illegal drugs on or off school property and/or before a school activity will not be allowed to be on school property or to participate in school activities. Staff members who violate this policy will be subject to the same penalties as for possession and/or consumption on school property.~~

~~An employee of the District who, pursuant to local conditions or an employment contract with the District, resides on District property or resides in District housing may possess and use alcohol at the employee's residence subject to the following restrictions:~~

> ~~A. The employee shall not possess (except for possession at said residence), sell, offer to sell, transfer, use, or be under the influence of alcohol while on duty.~~
>
> ~~B. Any alcohol consumption that occurs on school property when the employee is not on duty shall be done in moderation and shall occur within the employee's residence.~~

~~Adopted: _____~~

~~LEGAL REF.:~~
~~A.R.S.~~
~~15-321~~
~~15-341~~

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ADVISORY 974

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GBED ©
SMOKING ~~BY STAFF MEMBERS~~

Prohibitions

The possession or use of tobacco products, tobacco substitutes, electronic cigarettes, other chemical inhalation devices, or vapor products is prohibited in the following locations:

A. School grounds.

B. School buildings.

C. School parking lots.

D. School playing fields.

E. School buses ~~and other~~ or District vehicles.

F. Off-campus school-sponsored events.

Violations

Under the provisions of A.R.S. 36-798.03, a person who violates the prohibition is guilty of committing a petty offense. Any employee who violates this policy in any manner is subject to discipline, which may include, but is not limited to, dismissal.

Exceptions:

A. The prohibitions do not apply to an adult when possession or use of the tobacco products ~~are~~ is for demonstration purposes as a necessary instructional component of a tobacco prevention or cessation program that is:

1. ~~A.~~ Approved by the school.

2. ~~B.~~ Established in accord with Arizona Revised Statute 15-712.

B. A District employee may possess legal tobacco products, tobacco substitutes, electronic cigarettes, other chemical inhalation devices, or vapor products that are kept in the employee's personal locked motor vehicle as long as the product or device cannot be seen from outside the vehicle. However, the use of such products in said personal vehicle while on District property or at any District-sponsored activity is prohibited.

Adopted: _____

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LEGAL REF.:
A.R.S.
13-3622
15-341
15-712
36-798.03
20 U.S.C. 6083

CROSS REF.:
JICG - Tobacco Use by Students

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GBEF ©
~~STAFF~~ USE OF ~~DIGITAL~~ PORTABLE WIRELESS COMMUNICATIONS ~~AND ELECTRONIC~~ DEVICES

Social Media

Social media is the use of web-based and mobile technologies to communicate through interactive dialogue. Social media technologies/platforms include social networking sites, blogs, microblogs, content communities and virtual communities ~~include but are not limited, to blogs, picture-sharing, vlogs, wall-postings, e-mail, instant messaging, music-sharing, crowdsourcing, voice over IP (VoIP), Facebook, LinkedIn, X, YouTube~~, and any successor protocol to transmit information.

Mobile Technologies

Mobile technologies are any devices that: transmit sounds, images, texts, messages, videos, or electronic information; electronically records, plays, or stores information; or accesses the Internet, or private communication or information networks. ~~Current examples are Smartphones such as Android, iPhone, and other such mobile technologies and subsequent generations of these and related devices~~.

Guidelines

The Governing Board ~~recognizes how web-based and mobile technologies are fundamentally changing opportunities to communicate with individuals or groups and how their use can empower the user and enhance discourse. The Board equally recognizes that the misuse of such technologies can be potentially damaging to the District, employees, students and the community. Accordingly, the Governing Board~~ requires all employees to use wireless communication ~~adhere to adopted policies and to utilize digital communications and electronic~~ devices in a professional manner at all times and to follow all applicable state and federal laws.

The Board establishes the following parameters:

District employees:

A. shall adhere to all Governing Board policies related to technologies including but not limited to the use of District technology, copyright laws, student rights, parent rights, the Family Educational Rights and Privacy Act (FERPA), the Child Internet Protection Act, staff ethics, and staff-student relations;

B. are responsible for the content of their posting on any form of technology through any form of communication;

C. shall only use District controlled and approved technologies when communicating with students or parents;

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D. shall ensure that technologies used to communicate with students and District staff are maintained separate from personal technologies used to communicate with others;

E. shall not use District owned or provided technologies to endorse or promote a product, a cause or a political position or candidate;

F. in all instances must be aware of his/her association with the District and ensure the related content of any posting is consistent with how they wish to present themselves to colleagues, community members, parents and students;

G. shall not use District logos or District intellectual property without the written approval of the Superintendent;

H. shall use technologies to enhance and add value to communications with all recipients and be respectful of those with whom they communicate;

I. shall immediately report all misuse or suspected misuse of technology to their direct supervisor/administrator who in turn will immediately report to the Superintendent;

J. shall comply with all applicable records management parameters established by Arizona State Library, Archives and Public Records.

Operating a Portable Wireless Communication Device While Driving

Arizona law (A.R.S. 28-914, effective January 1, 2021), states that a person may not operate a motor vehicle on a street or highway if the person does either of the following:

A. physically holds or supports with any part of the person's body either of the following:

1. portable wireless communication device, except that a person may use a portable wireless communication device with an earpiece, headphone device or device worn on a wrist to conduct a voice-based communication.

2. a stand-alone electronic device.

B. writes, sends or reads any text-based communication, including a text message, instant message, e-mail or Internet data, on a portable wireless communication device or stand-alone electronic device.

This does not apply to either of the following:

A. the use of voice-based communications, including through the use of a portable wireless communication device or stand-alone electronic device, to direct the writing, sending, reading or other communicating of any text-based communication.

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B. the use of a portable wireless communication device or stand-alone device when used in a hands-free manner for:

1. navigation of the motor vehicle.

2. use of a global positioning system.

3. obtaining motor vehicle information or information related to driving a motor vehicle.

This also does not prohibit the operation of a motor vehicle while using a device, including a device that is accessible through an interface that is embedded in a motor vehicle, that allows communication without the use of either of the driver's hands, except to activate or deactivate a function of the device.

An operator may use a portable wireless communication device:

A. to report illegal activity or summon emergency help.

B. that was permanently or temporarily affixed to the motor vehicle to relay information in the course of the operator's occupational duties between the operator and either: i) a dispatcher, ii) a digital network or software application service.

Definitions

Portable wireless communication device:

A. means a cellular telephone, a portable telephone, a text-messaging device, a personal digital assistant, a stand-alone computer, a global positioning system receiver or a substantially similar portable wireless device that is used to initiate or receive communication, information or data.

B. does not include a radio, citizens band radio, citizens band radio hybrid, commercial two-way radio communication device or its functional equivalent, subscription-based emergency communication device, prescribed medical device, amateur or ham radio device or in-vehicle security, navigation or remote diagnostics system.

Stand-alone electronic device:

means a portable device other than a portable wireless communication device that stores audio or video data files to be retrieved on demand by a user.

Communication

The Superintendent shall communicate the above to all employees of the District at the beginning of each school year and to newly hired employees as part of the hiring process.

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The Superintendent shall establish which technologies are approved for use by employees to communicate with parents and students. Approved technologies shall be communicated to the Board and employees prior to the start of every school year, to newly elected Board members prior to taking office, and to newly hired employees as part of the hiring process.

The Superintendent shall determine which records retention and management guidelines as established by the Arizona State Library, Archives and Public Records are applicable to this Board policy and communicate these guidelines to the Board and employees prior to the start of every school year, to newly elected Board members prior to taking office, and newly hired employees as part of the hiring process.

Violations

Violations of this policy may result in disciplinary action up to and including termination and may constitute a violation of federal or state law in which case appropriate law enforcement shall be notified. The Superintendent shall report violations of this policy to the Board and shall make reports to the appropriate law enforcement agency when determined necessary.

Adopted: _____

LEGAL REF.:
A.R.S.
15-341
15-514
28-914
28-963
28-3164
20 U.S.C. 1232g Family Educational Rights and Privacy Act (FERPA)
47 CFR 54.520 Child Internet Protection Act

CROSS REF.:
EEAE - Bus Safety and Student Conduct
EEAEA - Bus Driver Requirements, Training, and Responsibilities
EEA - Student Transportation
EEB - Business and Personnel Transportation Services and Records and Reports
GBEA - ~~Staff~~ Ethics and Code of Conduct
~~GBEB - Staff Conduct~~
GBEBB - ~~Staff~~ Conduct With Students
GCQF - Discipline, Suspension, and Dismissal ~~of Professional Staff Members~~
~~GDQD - Discipline, Suspension, and Dismissal of Support Staff Members~~
IJNDB - Use of Technology Resources in Instruction
JIC - Student Conduct

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ADVISORY 976

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~~GBEFA ©~~
~~STAFF USE OF DIGITAL WIRELESS COMMUNICATIONS OR ELECTRONIC DEVICES WHILE OPERATING A MOTOR VEHICLE~~

~~Arizona law (A.R.S. 28-914, effective January 1, 2021), states that a person may not operate a motor vehicle on a street or highway if the person does either of the following:~~

~~A. physically holds or supports with any part of the person's body either of the following:~~

~~1. portable wireless communication device, except that a person may use a portable wireless communication device with an earpiece, headphone device or device worn on a wrist to conduct a voice-based communication.~~

~~2. a stand-alone electronic device.~~

~~B. writes, sends or reads any text-based communication, including a text message, instant message, e-mail or Internet data, on a portable wireless communication device or stand-alone electronic device.~~

~~This does not apply to either of the following:~~

~~A. the use of voice-based communications, including through the use of a portable wireless communication device or stand-alone electronic device, to direct the writing, sending, reading or other communicating of any text-based communication.~~

~~B. the use of a portable wireless communication device or stand-alone device when used in a hands-free manner for:~~

~~1. navigation of the motor vehicle.~~

~~2. use of a global positioning system.~~

~~3. obtaining motor vehicle information or information related to driving a motor vehicle.~~

~~This also does not prohibit the operation of a motor vehicle while using a device, including a device that is accessible through an interface that is embedded in a motor vehicle, that allows communication without the use of either of the driver's hands, except to activate or deactivate a function of the device.~~

~~An operator may use a portable wireless communication device:~~

~~A. to report illegal activity or summon emergency help.~~

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~~B. that was permanently or temporarily affixed to the motor vehicle to relay information in the course of the operator's occupational duties between the operator and either: i) a dispatcher, ii) a digital network or software application service.~~

"~~*Portable wireless communication device*:~~"

~~A. means a cellular telephone, a portable telephone, a text-messaging device, a personal digital assistant, a stand-alone computer, a global positioning system receiver or a substantially similar portable wireless device that is used to initiate or receive communication, information or data.~~

~~B. does not include a radio, citizens band radio, citizens band radio hybrid, commercial two-way radio communication device or its functional equivalent, subscription-based emergency communication device, prescribed medical device, amateur or ham radio device or in-vehicle security, navigation or remote diagnostics system.~~

"~~*Stand-alone electronic device*" means a portable device other than a portable wireless communication device that stores audio or video data files to be retrieved on demand by a user.~~

~~The Superintendent will develop training to implement this policy prior to the effective date.~~

~~Adopted: _____~~

~~LEGAL REF.:~~
~~A.R.S.~~
~~15-341~~
~~15-514~~
~~28-914~~
~~28-963~~
~~28-3164~~

~~CROSS REF.:~~
~~EEAE - Bus Safety Program~~
~~EEAEA - Bus Driver Requirements, Training, and Responsibilities~~
~~EEAG - Student Transportation in Private Vehicles~~
~~EEB - Business and Personnel Transportation Services~~
~~GBEA - Staff Ethics~~
~~GBEB - Staff Conduct~~
~~GBEBB - Staff Conduct With Students~~
~~GCQF - Discipline, Suspension, and Dismissal of Professional Staff Members~~
~~GDQD - Discipline, Suspension, and Dismissal of Support Staff Members~~
~~IJNDB - Use of Technology Resources in Instruction~~
~~JIC - Student Conduct~~

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ADVISORY 977

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Required Compliance Procedures

The Superintendent shall have procedures for complying with the requirements of the Occupational Safety and Health Administration (OSHA), including an exposure-control plan, methods of compliance, work-practice controls, postexposure evaluation and follow-up, and administering vaccine to employees exposed to Hepatitis B virus.

Communicable Diseases

It is the policy of the District to take reasonable and lawful measures to protect students and staff members from the transmission of communicable diseases. The Superintendent is authorized to adopt such procedures as are necessary to implement this policy in a manner consistent with state and federal laws.

Immunization

The District shall require vaccination against communicable diseases from all employees unless an exception is requested and granted, consistent with state and federal laws.

Bloodborne Pathogens Exposure

All employees who as a result of their employment have had significant exposure to bloodborne pathogens (Hepatitis B/Human Immunodeficiency Virus, HIV-AIDS) are required to report the details of the exposure in writing to the District and are required to follow post-exposure evaluation and follow-up activities in accordance with Arizona and federal laws. An employee who chooses not to complete these reporting requirements will be at risk of losing any claim to rights.

COVID-19

The School District shall not:

A. Require a resident of this state to receive a vaccination for COVID-19 or any variant of COVID-19.

B. Impose any requirement to wear a mask or face covering anywhere on the School District's premises, except where long-standing workplace safety and infection control measures unrelated to COVID-19 may be required. See GBGA-RB for a list of long-standing workplace safety control measures.

Universal Precautions

The District shall follow the "Universal Precautions Standard" in Exhibit GBGA-EB to protect employees who are at risk of being exposed to blood and body fluids in the course of their work.

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Exclusion from School

A staff member who has a communicable disease shall be excluded from school only if the staff member presents a direct threat to the health or safety of others in the employee's workplace. The outbreak control measures, and other directives of the Arizona Department of Health Services (DHS) and local health agencies shall be acted upon as the best medical knowledge and judgments with regard to the exclusion of a staff member who has a communicable disease that is addressed by DHS regulations. The communicable diseases specifically addressed by DHS regulations are listed at A.A.C. R9-6-203 *et seq*.

A staff member who has a chronic communicable disease, such as tuberculosis or HIV/AIDS, shall not be excluded unless a significant risk is presented to the health and safety of others, which cannot be eliminated by reasonable accommodation. The Superintendent shall consult with legal counsel and health professionals, as necessary, to ensure that exclusion of a staff member with a chronic communicable disease will not violate the staff member's rights under the Americans with Disabilities Act or Section 504 of the Rehabilitation Act.

The school nurse or other person designated by the Superintendent must reassess a staff member who is excluded from school because of a communicable disease before the staff member returns to work. The District may require a physician's written medical release as a condition for the staff member's return to work.

Reporting and Notification

If an outbreak of a communicable disease occurs in a school setting, the Superintendent or the school nurse shall promptly inform staff members who are known to have special vulnerability to infection.

The District does not assume any duty to notify an employee of health risks caused by the presence of a communicable disease in the school setting unless the at-risk employee has notified the District of the conditions when notification is needed.

The District shall report by telephone to its local health agency each diagnosed and suspected case of a communicable disease as set out in Regulation JLCB-R.

Eye Protective Devices

The Superintendent shall establish procedures for every student, teacher, and visitor in public schools that shall require the wearing of appropriate eye protective ware while participating in or when observing vocational, technical, industrial arts, art, or laboratory science activities.

The Board shall equip the schools with eye protective ware.

Schools may receive and expend federal, state, and local monies to provide eye protective devices.

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Confidentiality

The District shall make reasonable efforts to maintain the confidentiality of staff members' medical conditions. All medical information relating to employees is confidential. The identity of a staff member who has a communicable disease and/or the nature of the communicable disease may be disclosed only to:

A. Staff members who must have such information to carry out their duties under this policy; or

B. Staff members or students (or their parents/guardians) who must have such information to protect themselves from direct threat to their health or safety.

Inquiries or concerns by staff members or others regarding communicable diseases or a staff member who is known or believed to have a communicable disease shall be directed to the Superintendent or the school nurse.

Food Service Workers

The District shall follow the guidance of the U.S. Department of Health and Human Services concerning infectious and communicable diseases transmitted through the handling of food, and special precautions required for food services workers.

Adopted: _____

LEGAL REF.:
A.R.S.
15-151
15-505
23-901
23-902
23-904
23-906
23-908
23-961
23-962
36-681
36-685
A.A.C.
R9-6-706
R9-6-707

CROSS REF.:
EBBB - Accident Reports
GBGD - Workers' Compensation

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REGULATION

HEALTH

Immunizations

Unless legally exempted, all staff members must show proof of immunity to measles and rubella [see Policy GBGA].

Measles (Rubeola)

Acceptable proof of immunity to measles shall consist of:

A. A record of immunization against measles with a live virus vaccine given on or after the first birthday; or

B. A statement, signed by a licensed physician or a state or local health officer, that affirms serologic evidence of having had measles.

C. Anyone born prior to January 1, 1957, shall be considered to be immune to measles. (Rubeola)

German Measles (Rubella)

Evidence of immunity to rubella shall consist of:

A. A record of immunization against rubella given on or after the first birthday; or

B. A statement, signed by a licensed physician or a state or local health officer, that affirms serologic evidence of having had rubella.

Outbreak Information

In the event of an outbreak of either disease, self-reported history of immunization or prior disease is not acceptable; written documentation of immunity consistent with the acceptable proof described above is required.

During an outbreak of measles or rubella, nonimmune staff members, including those who utilize the exemption, may be excluded from the workplace at the direction of the local health agency.

Staff members who are excluded from the workplace shall be placed on leave in accordance with Policy GCCA, applicable employment agreements, and applicable state or federal law.

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Implementing Policy

The District shall generate a list of all staff members to identify those who need proof of immunity to measles.

The Superintendent shall distribute information about the District's policy on measles and rubella.

The Superintendent shall collect proof of immunity from staff members and compile a list denoting immunity or nonimmunity of staff members.

Nonimmune staff members shall be referred for vaccine to a physician or the County Health Department. Their records will be updated as they receive the vaccine.

Maintaining Policy

Throughout each school year, new staff members shall be required to show proof of immunity before employment.

A list of nonimmune employees shall be maintained and updated throughout the year.

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REGULATION

HEALTH

Eye Protective Devices

Every student, teacher, and visitor in public schools shall wear appropriate eye protective ware while participating in or when observing vocational, technical, industrial arts, art, or laboratory science activities involving exposure to:

A. Molten metals or other molten materials.

B. Cutting, shaping, and grinding of materials.

C. Heat treatment, tempering, or kiln firing of any metal or other materials.

D. Welding fabrication processes.

E. Explosive materials.

F. Caustic solutions.

G. Radiation materials.

The Board shall equip the schools with eye protective ware.

Schools may receive and expend federal, state, and local monies to provide eye protective devices.

Definition

For purposes of this procedure, *eye protective ware* means devices meeting the requirements of the American National Standards Institute's standards for occupational and education eye protection, Z87.1-1989. [A.R.S. 15-151]

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EXHIBIT

HEALTH

BLOODBORNE PATHOGEN REQUIREMENTS

Exposure Control Plan

Employee(s) with occupational exposure to human blood, human blood components, products made from human blood, or pathogenic microorganisms, including but not limited to Hepatitis B virus or HIV, shall comply with this Exposure Control Plan designed to eliminate or minimize employee exposure.

This Exposure Control Plan contains the following elements:

A. The exposure determination outlined below.

B. The schedule and method of implementation.

C. The procedure for the evaluation of circumstances surrounding exposure.

A copy of this Exposure Control Plan shall be accessible to employees.

This Exposure Control Plan shall be reviewed and updated at least annually and whenever necessary to reflect new or modified tasks and procedures that affect occupational exposure, and to reflect new or revised employee positions with occupational exposure.

This Exposure Control Plan shall be made available to the Assistant Secretary of Labor and the Director of the Occupational Safety and Health Administration upon request for examination and copying.

Exposure Determination

The District has determined that employee positions may involve the following levels of exposure to bloodborne pathogens as a collateral function to the primary job description:

A. High risk - Coaches, physical education instructors, custodians, certain special education program personnel, playground duty personnel, health services personnel, and security personnel.

B. Moderate risk - Regular instructional program personnel, other special education program personnel, school level office personnel, maintenance personnel, food services personnel, and special assignment personnel (e.g., counselors, librarians).

C. Low risk - District level office personnel.

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Methods of Compliance

General. Universal precautions shall be observed by all District employees to prevent contact with blood or other potentially infectious materials. Under circumstances in which differentiation between body fluid types is difficult or impossible, all body fluids shall be considered potentially infectious materials.

Engineering and work practice controls:

A. Engineering and work practice controls shall be used to eliminate or minimize employee exposure. If occupational exposure remains after institution of these controls, personal protective equipment shall also be used.

B. Engineering controls shall be examined and maintained or replaced on a regular schedule to ensure their effectiveness.

C. The District shall provide hand-washing facilities that are readily accessible to employees.

D. When provision of hand-washing facilities is not feasible, the District shall provide either an appropriate antiseptic hand cleanser in conjunction with clean cloth/paper towels or antiseptic towelettes. When antiseptic hand cleansers or towelettes are used, hands shall be washed with soap and running water as soon as feasible.

E. The District requires that employees wash their hands immediately or as soon as feasible after removal of gloves or other personal protective equipment. Supervisory personnel shall ensure compliance.

F. The District requires that employees wash hands and any other skin with soap and water, or flush mucous membranes with water immediately or as soon as feasible following contact of such body areas with blood or other potentially infectious materials. Supervisory personnel shall ensure compliance.

G. Contaminated needles and other contaminated sharps shall not be bent, recapped, or removed except as noted below. Shearing or breaking of contaminated needles is prohibited.

1. Contaminated needles and other contaminated sharps shall not be recapped or removed unless no other alternative is feasible or such action is required by a specific medical procedure as determined by a competent medical professional qualified to make such determination.

2. Such recapping or needle removal must be accomplished through the use of a mechanical device or a one-handed technique.

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H. Immediately or as soon as possible after use, contaminated reusable sharps shall be placed in appropriate containers until properly reprocessed.

I. Eating, drinking, smoking, applying cosmetics or lip balm, and handling contact lenses are prohibited in work areas where there is a reasonable likelihood of occupational exposure.

J. Food and drink shall not be kept in refrigerators, freezers, shelves, or cabinets, or on countertops or benchtops where blood or other potentially infectious materials are present.

K. All procedures involving blood or other potentially infectious materials shall be performed in such a manner as to minimize splashing, spraying, spattering, and generation of droplets of these substances.

L. Mouth pipetting/suctioning of blood or other potentially infectious materials is prohibited.

M. Specimens of blood or other potentially infectious materials shall be placed in a container that prevents leakage during collection, handling, processing, storage, transport, or shipping.

1. The container for storage, transport, or shipping shall be labeled or color coded according to law and closed prior to being stored, transported, or shipped. When a facility utilizes "universal precautions" in the handling of all specimens, the labeling/color coding of specimens is not necessary, provided containers are recognizable as containing specimens. This exemption applies only while such specimens/containers remain with the facility. Labeling or color coding is required when such specimens/containers leave the facility.

2. If outside contamination of the primary container occurs, the primary container shall be placed within a second container that prevents leakage during handling, processing, storage, transport, or shipping and is labeled or color coded according to the requirements of this standard.

3. If the specimen could puncture the primary container, the primary container shall be placed within a secondary container that is puncture resistant in addition to the above characteristics.

N. Equipment that may become contaminated with blood or other potentially infectious materials shall be examined prior to servicing or shipping and shall be decontaminated as necessary, unless the decontamination of such equipment or portions of such equipment is not feasible as determined by a supervisory employee assigned to make such determination.

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1. A readily observable label in accordance with law shall be attached to the equipment stating which portions remain contaminated.

2. This information shall be conveyed to all affected employees, the servicing representative, and/or the manufacturer, as appropriate, prior to handling, servicing, or shipping so that appropriate precautions will be taken.

Personal protective equipment:

A. *Provision*. When occupational exposure occurs, the District shall provide, at no cost to the employee, appropriate personal protective equipment such as, but not limited to, gloves, gowns, laboratory coats, face shields or masks and eye protection, and mouthpieces, resuscitation bags, pocket masks, or other ventilation devices. Personal protective equipment will be considered "appropriate" only if it does not permit blood or other potentially infectious materials to pass through to or reach the employee's work clothes, street clothes, undergarments, skin, eyes, mouth, or other mucous membranes under normal conditions of use and for the duration of time that the protective equipment will be used.

B. *Use*. The District requires that all exposed employees use appropriate personal protective equipment unless the District documents that a specific employee temporarily and briefly declined to use personal protective equipment when, under rare and extraordinary circumstances, it was such employee's professional judgment that in the specific instance its use would have prevented the delivery of health care or public safety services or would have posed an increased hazard to the safety of the worker or co-worker. When the employee makes this judgment, the circumstances shall be reported by the employee and investigated and documented by the District in order to determine whether changes can be instituted to prevent such occurrences in the future.

C. *Accessibility*. Appropriate personal protective equipment in the appropriate sizes must be readily accessible at the work site or issued to employees. Hypoallergenic gloves, glove liners, powderless gloves, or other similar alternatives shall be readily accessible to employees who are allergic to the gloves normally provided.

D. *Cleaning, laundering, and disposal*. The District shall clean, launder, and dispose of personal protective equipment required in this standard, at no cost to the employee.

E. *Repair and replacement*. The District shall repair or replace personal protective equipment as needed to maintain its effectiveness, at no cost to the employee.

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F. Any garment(s) penetrated by blood or other potentially infectious materials shall be removed immediately or as soon as feasible.

G. All personal protective equipment shall be removed prior to leaving the work area.

H. When personal protective equipment is removed it shall be placed in an appropriately designated area or container for storage, washing, decontamination, or disposal.

I. *Gloves*. Gloves shall be worn when it can be reasonably anticipated that the employee may have hand contact with blood, other potentially infectious materials, mucous membranes, and nonintact skin; when performing vascular access procedures; and when handling or touching contaminated items or surfaces.

1. Disposable (single-use) gloves, such as surgical or examination gloves, shall be replaced as soon as practical when contaminated or as soon as feasible if they are torn, punctured, or their ability to function as a barrier is compromised.

2. Disposable (single-use) gloves shall not be washed or decontaminated for reuse.

3. Utility gloves may be decontaminated for reuse if the integrity of the gloves is not compromised. However, they must be discarded if they are cracked, peeling, torn, punctured, or exhibit other signs of deterioration or when their ability to function as a barrier is compromised.

Housekeeping:

A. *General*. The work site must be maintained in a clean and sanitary condition. The District shall establish, attach hereto, and implement an appropriate written schedule for cleaning and the method of decontamination based upon the location within the facility, type of surface to be cleaned, type of soil present, and tasks or procedures being performed in the area.

B. All school activity areas are cleaned daily.

C. In cleaning operations involving human blood, a cleaning solution consisting of ten to one (10:1) ratio of water and bleach will be used.

D. All equipment and environmental and working surfaces shall be cleaned and decontaminated after contact with blood or other potentially infectious materials.

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1. Contaminated work surfaces shall be decontaminated with an appropriate disinfectant after completion of procedures, immediately or as soon as feasible when surfaces are overtly contaminated or after any spill of blood or other potentially infectious materials, and at the end of the work shift if the surface may have become contaminated since the last cleaning.

2. Protective coverings - such as plastic wrap, aluminum foil, or imperviously backed absorbent paper used to cover equipment and environmental surfaces - shall be removed and replaced as soon as feasible when they become overtly contaminated or at the end of the work shift if they may have become contaminated during the shift.

3. All bins, pails, cans, and similar receptacles intended for reuse that have a reasonable likelihood of becoming contaminated with blood or other potentially infectious materials shall be inspected and decontaminated on a regularly scheduled basis and cleaned and decontaminated immediately or as soon as feasible upon visible contamination.

4. Broken glassware that may be contaminated shall not be picked up directly with the hands. It shall be cleaned up using mechanical means such as a brush and dust pan, tongs, or forceps.

5. Reusable sharps that are contaminated with blood or other potentially infectious materials shall not be stored or processed in a manner that requires employees to reach by hand into the containers where these sharps have been placed.

E. *Regulated waste*:

1. Contaminated sharps discarding and containment:

a. Contaminated sharps shall be discarded immediately or as soon as feasible in containers that are:

I. Closable.

II. Puncture resistant.

III. Leakproof on sides and bottom.

IV. Labeled or color coded.

b. During use, containers for contaminated sharps shall be:

I. Easily accessible to personnel and located as close as is feasible to the immediate area where sharps are used or can be reasonably anticipated to be found (e.g., laundries).

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II. Maintained upright throughout use.

III. Replaced routinely and not be allowed to overfill.

c. When moving containers of contaminated sharps from the area of use, the containers shall be:

I. Closed immediately prior to removal or replacement to prevent spillage or protrusion of contents during handling, storage, transport, or shipping.

II. Placed in a secondary container if leakage is possible. The second container shall be:

i. Closable.

ii. Constructed to contain all contents and prevent leakage during handling, storage, transport, or shipping.

iii. Labeled or color coded.

d. Reusable containers shall not be opened, emptied, or cleaned manually or in any other manner that would expose employees to the risk of percutaneous injury.

2. Other regulated waste containment:

a. Regulated waste shall be placed in containers that are:

I. Closable.

II. Constructed to contain all contents and prevent leakage of fluids during handling, storage, transport, or shipping.

III. Labeled or color coded.

IV. Closed prior to removal to prevent spillage or protrusion of contents during handling, storage, transport, or shipping.

b. If outside contamination of the regulated waste container occurs, it shall be placed in a second container. The second container shall be:

I. Closable.

II. Constructed to contain all contents and prevent leakage of fluids during handling, storage, transport, or shipping.

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III. Labeled or color coded.

IV. Closed prior to removal to prevent spillage or protrusion of contents during handling, storage, transport, or shipping.

3. Disposal of all regulated waste shall be in accordance with applicable regulations of the United States, states, territories, and political subdivisions of states and territories.

F. *Laundry*:

1. Contaminated laundry shall be handled as little as possible, with a minimum of agitation.

a. Contaminated laundry shall be bagged or containerized at the location where it was used and shall not be sorted or rinsed in the location of use.

b. Contaminated laundry shall be placed and transported in bags or containers labeled or color coded. When a facility utilizes universal precautions in the handling of all soiled laundry, alternative labeling or color coding is sufficient if it permits all employees to recognize the containers as requiring compliance with universal precautions.

c. Whenever contaminated laundry is wet and presents a reasonable likelihood of soak-through of or leakage from the bag or container, the laundry shall be placed and transported in bags or containers that prevent soaking-through and/or leakage of fluids to the exterior.

2. Employees who have contact with contaminated laundry must wear protective gloves and other appropriate personal protective equipment.

3. When a facility ships contaminated laundry off-site to a second facility, which does not utilize universal precautions in the handling of all laundry, the facility generating the contaminated laundry must place such laundry in bags or containers that are labeled or color-coded.

Hepatitis B Vaccination and Postexposure Evaluation and Follow-up

General:

A. **The District shall make available the hepatitis B vaccine and vaccination series to all employees who have occupational exposure, and postexposure evaluation and follow-up to all employees who have had an exposure incident.**

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B. The District requires that all medical evaluations and procedures, including the hepatitis B vaccine, and vaccination series and postexposure evaluation and follow-up, including prophylaxis, are:

1. Made available at no cost to the employee.

2. Made available to the employee at a reasonable time and place.

3. Performed by or under the supervision of a licensed physician or by or under the supervision of another licensed health care professional.

4. Provided according to recommendations of the U.S. Public Health Service current at the time these evaluations and procedures take place, except as specified in this section on hepatitis B vaccination and postexposure evaluation and follow-up.

C. The District requires that all laboratory tests be conducted by an accredited laboratory at no cost to the employee.

Hepatitis B vaccination:

A. Hepatitis B vaccination shall be made available after the employee has received the training required and within ten (10) business days of initial assignment to all employees who have occupational exposure unless the employee has previously received the complete hepatitis B vaccination series, antibody testing has revealed that the employee is immune, or the vaccine is contraindicated for medical reasons.

B. The District shall not make participation in a prescreening program a prerequisite for receiving hepatitis B vaccination.

C. If the employee initially declines hepatitis B vaccination but at a later date while still covered under the standard decides to accept the vaccination, the District shall make available hepatitis B vaccination at that time.

D. The District requires all employees who decline to accept hepatitis B vaccination that is offered to sign the following statement:

> I understand that due to my occupational exposure to blood or other potentially infectious materials I may be at risk of acquiring hepatitis B virus (HBV) infection. I have been given the opportunity to be vaccinated with hepatitis B vaccine, at no charge to myself. However, I decline hepatitis B vaccination at this time. I understand that by declining this vaccine, I continue to be at risk of acquiring hepatitis B, a serious disease. If in the future I continue to have occupational exposure to blood or other potentially infectious materials and I want to be vaccinated with hepatitis B vaccine, I can receive the vaccination series at no charge to me.

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E. If a routine booster dose(s) of hepatitis B vaccine is recommended by the U.S. Public Health Service at a future date, such booster dose(s) shall be made available.

Postexposure evaluation and follow-up. Following a report of an exposure incident, the District shall make immediately available to the exposed employee a confidential medical evaluation and follow-up, including at least the following elements:

A. Documentation of the route(s) of exposure, and the circumstances under which the exposure incident occurred.

B. Identification and documentation of the source individual, unless the District can establish that identification is infeasible or prohibited by state or local law.

1. The source individual's blood shall be tested as soon as feasible, and after consent is obtained, in order to determine HBV and HIV infectivity. If consent is not obtained, the District shall establish that legally required consent cannot be obtained. When the source individual's consent is not required by law, the source individual's blood, if available, shall be tested and the result documented.

2. When the source individual is already known to be infected with HBV or HIV, testing for the source individual's known HBV or HIV status need not be repeated.

3. Results of the source individual's testing shall be made available to the exposed employee, and the employee shall be informed of applicable laws and regulations concerning disclosure of the identity and infectious status of the source individual.

C. Collection and testing of blood for HBV and HIV serological status:

1. The exposed employee's blood shall be collected as soon as feasible and tested after consent is obtained.

2. If the employee consents to base-line blood collection, but does not give consent at that time for HIV serologic testing, the sample shall be preserved for at least ninety (90) days. If within ninety (90) days of the exposure incident the employee elects to have the base-line sample tested, such testing shall be done as soon as feasible.

D. Postexposure prophylaxis, when medically indicated, as recommended by the U.S. Public Health Service.

E. Counseling.

F. Evaluation of reported illnesses.

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Information provided to the health care professional:

A. The health care professional responsible for the employee's hepatitis B vaccination shall be provided a copy of this document.

B. The health care professional evaluating an employee after an exposure incident shall be provided the following information:

1. A copy of this document.

2. A description of the exposed employee's duties as they relate to the exposure incident.

3. Documentation of the route(s) of exposure and circumstances under which exposure occurred.

4. Results of the source individual's blood testing, if available.

5. All medical records relevant to the appropriate treatment of the employee, including vaccination status, that are the District's responsibility to maintain.

Health care professional's written opinion. The District shall obtain and provide the employee with a copy of the evaluating health care professional's written opinion within fifteen (15) days of the completion of the evaluation.

A. The health care professional's written opinion for hepatitis B vaccination shall be limited to whether hepatitis B vaccination is indicated for an employee and whether the employee has received such vaccination.

B. The health care professional's written opinion for postexposure evaluation and follow-up shall be limited to the following information:

1. That the employee has been informed of the results of the evaluation.

2. That the employee has been told about any medical conditions resulting from exposure to blood or other potentially infectious materials that require further evaluation or treatment.

C. All other findings or diagnoses shall remain confidential and shall not be included in the written report.

Medical record keeping. Medical records required by this standard shall be maintained.

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Communication of Hazards to Employees

Labels:

A. Warning labels shall be affixed to containers of regulated waste, refrigerators and freezers containing blood or other potentially infectious material, and other containers used to store, transport, or ship blood or other potentially infectious materials, except as provided in law.

B. These labels shall contain the "biohazard" label.

C. These labels shall be fluorescent orange or orange-red or predominantly so, with lettering or symbols in a contrasting color.

D. Labels are required to be affixed as close as feasible to the container by string, wire, adhesive, or other method that prevents their loss or unintentional removal.

E. Red bags or red containers may be substituted for labels.

F. Containers of blood, blood components, or blood products that are labeled as to their contents and have been released for transfusion or other clinical use are exempted from the labeling requirements of this section on communication of hazards to employees.

G. Individual containers of blood or other potentially infectious materials that are placed in a labeled container during storage, transport, shipment, or disposal are exempted from the labeling requirements.

H. Labels required for contaminated equipment shall be in accordance with this section and shall also state which portions of the equipment remain contaminated.

I. Regulated waste that has been decontaminated need not be labeled or color coded.

Information and training:

A. All employees with occupational exposure shall participate in a training program, which must be provided at no cost to the employees and during working hours.

B. Training shall be provided as follows:

1. At the time of initial assignment to tasks where occupational exposure may take place.

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2. Within ninety (90) days after the effective date of the standard.

3. At least annually thereafter.

C. For employees who have received training on bloodborne pathogens in the year preceding the effective date of the standard, only training with respect to the provisions of the standard that were not included need be provided.

D. Annual training for all employees shall be provided within one (1) year of their previous training.

E. The District shall provide additional training when changes such as modification of tasks or procedures or institution of new tasks or procedures affects the employee's occupational exposure. The additional training may be limited to addressing the new exposures created.

F. Material appropriate in content and vocabulary to educational level, literacy, and language of employees shall be used.

G. The training program shall contain at a minimum the following elements:

1. An accessible copy of the regulatory text of this standard and an explanation of its contents.

2. A general explanation of the epidemiology and symptoms of bloodborne diseases.

3. An explanation of the modes of transmission of bloodborne pathogens.

4. An explanation of the District's Exposure Control Plan and the means by which the employee can obtain a copy of the written plan.

5. An explanation of the appropriate methods for recognizing tasks and other activities that may involve exposure to blood and other potentially infectious materials.

6. An explanation of the use and limitations of methods that will prevent or reduce exposure, including appropriate engineering controls, work practices, and personal protective equipment.

7. Information on the types, proper use, location, removal, handling, decontamination, and disposal of personal protective equipment.

8. An explanation of the basis for selection of personal protective equipment.

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9. Information on the hepatitis B vaccine, including information on its efficacy, safety, method of administration, the benefits of being vaccinated, and that the vaccine and vaccination will be offered free of charge.

10. Information on the appropriate actions to take and persons to contact in an emergency involving blood or other potentially infectious materials.

11. An explanation of the procedure to follow if an exposure incident occurs, including the method of reporting the incident and the medical follow-up that will be made available.

12. Information on the postexposure evaluation and follow-up that the District is required to provide for the employee following an exposure incident.

13. An explanation of the labels and/or color coding required.

14. An opportunity for interactive questions and answers with the person conducting the training session.

H. The person conducting the training shall be knowledgeable in the subject matter covered by the elements contained in the training program as it relates to the workplace that the training will address.

Record Keeping

Medical records:

A. The District shall establish and maintain an accurate record for each employee with occupational exposure as defined herein.

B. This record shall include:

1. The name and Social Security number of the employee.

2. A copy of the employee's hepatitis B vaccination status, including the dates of all hepatitis B vaccinations and any medical records relative to the employee's ability to receive vaccination.

3. A copy of all results of examinations, medical testing, and follow-up procedures.

4. The District's copy of the health care professional's written opinion.

5. A copy of the information provided to the health care professional.

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C. *Confidentiality*. The District shall ensure that employee medical records required by law are:

1. Kept confidential.

2. Not disclosed or reported, without the employee's express written consent, to any person within or outside the workplace, except as required by law.

D. The District shall maintain the records required by law for at least the duration of employment plus thirty (30) years.

Training records:

A. Training records shall include the following information:

1. The dates of the training sessions.

2. The contents or a summary of the training sessions.

3. The names and qualifications of persons conducting the training.

4. The names and job titles of all persons attending the training sessions.

B. Training records shall be maintained for three (3) years from the date on which the training occurred.

Availability:

A. The District shall ensure that all records required to be maintained shall be made available, upon request, to the Assistant Secretary of Labor and the Director of the Occupational Safety and Health Administration for examination and copying.

B. Employee training records required by law shall be provided upon request for examination and copying to employees, to employee representatives, to the Director of the Occupational Safety and Health Administration, and to the Assistant Secretary of Labor.

C. Employee medical records required by law shall be provided upon request, for examination and copying, to the subject employee, to anyone having written consent of the subject employee, to the Director of the Occupational Safety and Health Administration, and to the Assistant Secretary of Labor.

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Transfer of records:

A. The District shall comply with the legal requirements involving transfer of records.

B. If the District ceases to do business and there is no successor district to receive and retain the records for the prescribed period, the District shall notify the Director of the Occupational Safety and Health Administration, at least three (3) months prior to their disposal, and transmit them to the Director of the Occupational Safety and Health Administration, if required by the Director of the Occupational Safety and Health Administration to do so, within that three (3) month period.

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EXHIBIT

HEALTH

COMMUNICABLE DISEASES

Handling Body Fluids in School

The following guidelines are meant to provide simple and effective precautions against transmission of disease for all people potentially exposed to the blood or body fluids of any person (student and/or school employee). No distinction is made between body fluids from persons with a known disease or those from persons without symptoms or with an undiagnosed disease.

The body fluids of all people should be considered to contain potentially infectious agents. The term *body fluids* includes blood, semen, drainage from scrapes and cuts, feces, urine, vomit, respiratory secretions (such as nasal discharge), and saliva.

A. Whenever possible, avoid direct skin contact with body fluids. Disposable gloves are recommended when direct hand contact with body fluids is anticipated. If extensive contact is made with body fluids, hands must be washed afterwards. Gloves used for this purpose should be put in a plastic bag, secured, and disposed of daily.

B. If direct skin contact does occur, hands and other affected skin areas of all exposed people shall be routinely washed with soap and water.

C. Proper handwashing requires the use of soap and water and vigorous washing under a stream of running water for at least twenty (20) seconds.

D. Clothing and other nondisposable items that are soaked through with body fluids should be rinsed and placed in plastic bags. If presoaking is required to remove stains, rinse or soak the item in cold water prior to bagging. Clothing should be sent home with the student for washing, with appropriate directions to parents and teachers (see *laundry instructions* below). Always wear gloves when handling items that have come in contact with body fluids.

E. Contaminated disposable items shall be handled with disposable gloves, put in a plastic bag, secured, and disposed of daily.

F. Body fluid spills on hard surfaces (i.e., floors, countertops, books, et cetera) shall be disinfected with bleach (diluted to ten [10] parts water and one [1] part bleach), and bleach solution should remain on the surface for at least one (1) minute before wiping. Gloves shall always be worn during cleanup.

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G. Cleaning equipment:

1. Nondisposable cleaning equipment (such as dust pans, brooms, and buckets) shall be disinfected by thoroughly rinsing in diluted bleach (ten [10] parts water and one [1] part bleach). Mops shall be soaked in the disinfectant after use and then rinsed with hot water. The disinfectant solution shall be promptly disposed of down a drain pipe.

2. Disposable cleaning equipment (such as paper towels, the vacuum bag, or sweepings) shall be placed in plastic bags, secured, and disposed of daily. No special handling is required for vacuuming equipment. Gloves shall always be used during cleanup.

H. Laundry instructions:

Clothing soaked with body fluids shall be washed separately from other items. Presoaking may be required for heavily soiled clothing. Otherwise, wash and dry as usual. If the material can be bleached, add one-half (1/2) cup of household bleach to the wash cycle. If the material is not colorfast, add one-half (1/2) cup of all-fabric bleach to the wash cycle.

LEGAL REF.:
A.R.S.
36-621 *et seq.*
A.A.C.
R9-6-101 *et seq.*

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ADVISORY 978

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~~STAFF PERSONAL SECURITY AND SAFETY~~

~~Threats~~

~~The Superintendent shall establish procedures that provide for the protection of any employee who is threatened with harm by an individual or a group while carrying out assigned duties.~~

~~Eye Protective Devices~~

~~The Superintendent shall establish procedures for every student, teacher, and visitor in public schools that shall require the wearing of appropriate eye protective ware while participating in or when observing vocational, technical, industrial arts, art, or laboratory science activities.~~

~~The Board shall equip the schools with eye protective ware.~~

~~Schools may receive and expend federal, state, and local monies to provide eye protective devices.~~

~~Adopted: _____~~

~~LEGAL REF.:~~
~~A.R.S.~~
~~13-1203~~
~~13-1204~~
~~13-2911~~
~~15-151~~
~~15-507~~

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~~REGULATION~~

~~STAFF PERSONAL SECURITY AND SAFETY~~

~~Threats~~

~~Any employee who is threatened with harm by an individual or a group while carrying out assigned duties shall immediately notify the school principal or supervisor. The principal or supervisor shall then immediately notify the Superintendent's office of the threat and together they shall take immediate steps in cooperation with the employee to provide every reasonable precaution for the employee's safety. Precautionary steps, including any advisable legal action, shall be reported to the Superintendent's office at the earliest possible time.~~

~~Eye Protective Devices~~

~~Every student, teacher, and visitor in public schools shall wear appropriate eye protective ware while participating in or when observing vocational, technical, industrial arts, art, or laboratory science activities involving exposure to:~~

~~A. Molten metals or other molten materials.~~

~~B. Cutting, shaping, and grinding of materials.~~

~~C. Heat treatment, tempering, or kiln firing of any metal or other materials.~~

~~D. Welding fabrication processes.~~

~~E. Explosive materials.~~

~~F. Caustic solutions.~~

~~G. Radiation materials.~~

~~The Board shall equip the schools with eye protective ware.~~

~~Schools may receive and expend federal, state, and local monies to provide eye protective devices.~~

~~For purposes of this procedure, *eye protective ware* means devices meeting the standards of the U.S.A. Standard Safety Code for head, eye, and respiratory protection, Z21-1959, and subsequent revisions thereof, approved by the United States of America Standards Institute, Inc.~~

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ADVISORY 979

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~~EMPLOYEE ASSISTANCE~~

~~Employees may be required by the Superintendent, for purposes of employment or retention, to submit to such tests or examinations as a licensed physician deems appropriate.~~

~~When, in the opinion of the immediate supervisor and/or the Superintendent, the employee's physical or emotional condition warrants, the District may require a complete examination, at District expense, by a licensed physician selected by the District.~~

~~The Superintendent shall have procedures for complying with the requirements of the Occupational Safety and Health Administration (OSHA), including an exposure-control plan, methods of compliance, work-practice controls, postexposure evaluation and follow-up, and administering vaccine to employees exposed to Hepatitis B virus.~~

~~All employees who as a result of their employment have had significant exposure to bloodborne pathogens (Hepatitis B/Human Immunodeficiency Virus) are required to report the details of the exposure in writing to the District and are required to follow postexposure evaluation and follow-up activities in accordance with Arizona and federal laws. An employee who chooses not to complete these reporting requirements will be at risk of losing any claim to rights.~~

~~Adopted: _____~~

~~LEGAL REF.:~~
~~A.R.S.~~
~~15-505~~
~~23-901~~
~~23-902~~
~~23-904~~
~~23-906~~
~~23-908~~
~~23-961~~
~~23-962~~

~~CROSS REF.:~~
~~EBBB - Accident Reports~~
~~GBGD - Workers' Compensation~~

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~~EXHIBIT~~

~~EMPLOYEE ASSISTANCE~~

~~BLOODBORNE PATHOGEN REQUIREMENTS~~

~~Exposure Control Plan~~

~~Employee(s) with occupational exposure to human blood, human blood components, products made from human blood, or pathogenic microorganisms, including but not limited to Hepatitis B virus or HIV, shall comply with this Exposure Control Plan designed to eliminate or minimize employee exposure.~~

~~This Exposure Control Plan contains the following elements:~~

~~A. The exposure determination outlined below.~~

~~B. The schedule and method of implementation.~~

~~C. The procedure for the evaluation of circumstances surrounding exposure.~~

~~A copy of this Exposure Control Plan shall be accessible to employees.~~

~~This Exposure Control Plan shall be reviewed and updated at least annually and whenever necessary to reflect new or modified tasks and procedures that affect occupational exposure, and to reflect new or revised employee positions with occupational exposure.~~

~~This Exposure Control Plan shall be made available to the Assistant Secretary of Labor and the Director of the Occupational Safety and Health Administration upon request for examination and copying.~~

~~Exposure Determination~~

~~The District has determined that employee positions may involve the following levels of exposure to bloodborne pathogens as a collateral function to the primary job description:~~

~~A. High risk - Coaches, physical education instructors, custodians, certain special education program personnel, playground duty personnel, health services personnel, and security personnel.~~

~~B. Moderate risk - Regular instructional program personnel, other special education program personnel, school level office personnel, maintenance personnel, food services personnel, and special assignment personnel (e.g., counselors, librarians).~~

~~C. Low risk - District level office personnel.~~

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~~**Methods of Compliance**~~

~~General. Universal precautions shall be observed by all District employees to prevent contact with blood or other potentially infectious materials. Under circumstances in which differentiation between body fluid types is difficult or impossible, all body fluids shall be considered potentially infectious materials.~~

~~Engineering and work practice controls:~~

~~A. Engineering and work practice controls shall be used to eliminate or minimize employee exposure. If occupational exposure remains after institution of these controls, personal protective equipment shall also be used.~~

~~B. Engineering controls shall be examined and maintained or replaced on a regular schedule to ensure their effectiveness.~~

~~C. The District shall provide hand-washing facilities that are readily accessible to employees.~~

~~D. When provision of hand-washing facilities is not feasible, the District shall provide either an appropriate antiseptic hand cleanser in conjunction with clean cloth/paper towels or antiseptic towelettes. When antiseptic hand cleansers or towelettes are used, hands shall be washed with soap and running water as soon as feasible.~~

~~E. The District requires that employees wash their hands immediately or as soon as feasible after removal of gloves or other personal protective equipment. Supervisory personnel shall ensure compliance.~~

~~F. The District requires that employees wash hands and any other skin with soap and water, or flush mucous membranes with water immediately or as soon as feasible following contact of such body areas with blood or other potentially infectious materials. Supervisory personnel shall ensure compliance.~~

~~G. Contaminated needles and other contaminated sharps shall not be bent, recapped, or removed except as noted below. Shearing or breaking of contaminated needles is prohibited.~~

~~1. Contaminated needles and other contaminated sharps shall not be recapped or removed unless no other alternative is feasible or such action is required by a specific medical procedure as determined by a competent medical professional qualified to make such determination.~~

~~2. Such recapping or needle removal must be accomplished through the use of a mechanical device or a one-handed technique.~~

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~~H. Immediately or as soon as possible after use, contaminated reusable sharps shall be placed in appropriate containers until properly reprocessed.~~

~~I. Eating, drinking, smoking, applying cosmetics or lip balm, and handling contact lenses are prohibited in work areas where there is a reasonable likelihood of occupational exposure.~~

~~J. Food and drink shall not be kept in refrigerators, freezers, shelves, or cabinets, or on countertops or benchtops where blood or other potentially infectious materials are present.~~

~~K. All procedures involving blood or other potentially infectious materials shall be performed in such a manner as to minimize splashing, spraying, spattering, and generation of droplets of these substances.~~

~~L. Mouth pipetting/suctioning of blood or other potentially infectious materials is prohibited.~~

~~M. Specimens of blood or other potentially infectious materials shall be placed in a container that prevents leakage during collection, handling, processing, storage, transport, or shipping.~~

> ~~1. The container for storage, transport, or shipping shall be labeled or color coded according to law and closed prior to being stored, transported, or shipped. When a facility utilizes "universal precautions" in the handling of all specimens, the labeling/color coding of specimens is not necessary, provided containers are recognizable as containing specimens. This exemption applies only while such specimens/containers remain with the facility. Labeling or color coding is required when such specimens/containers leave the facility.~~
>
> ~~2. If outside contamination of the primary container occurs, the primary container shall be placed within a second container that prevents leakage during handling, processing, storage, transport, or shipping and is labeled or color coded according to the requirements of this standard.~~
>
> ~~3. If the specimen could puncture the primary container, the primary container shall be placed within a secondary container that is puncture resistant in addition to the above characteristics.~~

~~N. Equipment that may become contaminated with blood or other potentially infectious materials shall be examined prior to servicing or shipping and shall be decontaminated as necessary, unless the decontamination of such equipment or portions of such equipment is not feasible as determined by a supervisory employee assigned to make such determination.~~

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~~1. A readily observable label in accordance with law shall be attached to the equipment stating which portions remain contaminated.~~

~~2. This information shall be conveyed to all affected employees, the servicing representative, and/or the manufacturer, as appropriate, prior to handling, servicing, or shipping so that appropriate precautions will be taken.~~

~~***Personal protective equipment:***~~

~~A. *Provision*. When occupational exposure occurs, the District shall provide, at no cost to the employee, appropriate personal protective equipment such as, but not limited to, gloves, gowns, laboratory coats, face shields or masks and eye protection, and mouthpieces, resuscitation bags, pocket masks, or other ventilation devices. Personal protective equipment will be considered "appropriate" only if it does not permit blood or other potentially infectious materials to pass through to or reach the employee's work clothes, street clothes, undergarments, skin, eyes, mouth, or other mucous membranes under normal conditions of use and for the duration of time that the protective equipment will be used.~~

~~B. *Use*. The District requires that all exposed employees use appropriate personal protective equipment unless the District documents that a specific employee temporarily and briefly declined to use personal protective equipment when, under rare and extraordinary circumstances, it was such employee's professional judgment that in the specific instance its use would have prevented the delivery of health care or public safety services or would have posed an increased hazard to the safety of the worker or co-worker. When the employee makes this judgment, the circumstances shall be reported by the employee and investigated and documented by the District in order to determine whether changes can be instituted to prevent such occurrences in the future.~~

~~C. *Accessibility*. Appropriate personal protective equipment in the appropriate sizes must be readily accessible at the work site or issued to employees. Hypoallergenic gloves, glove liners, powderless gloves, or other similar alternatives shall be readily accessible to employees who are allergic to the gloves normally provided.~~

~~D. *Cleaning, laundering, and disposal*. The District shall clean, launder, and dispose of personal protective equipment required in this standard, at no cost to the employee.~~

~~E. *Repair and replacement*. The District shall repair or replace personal protective equipment as needed to maintain its effectiveness, at no cost to the employee.~~

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~~F. Any garment(s) penetrated by blood or other potentially infectious materials shall be removed immediately or as soon as feasible.~~

~~G. All personal protective equipment shall be removed prior to leaving the work area.~~

~~H. When personal protective equipment is removed it shall be placed in an appropriately designated area or container for storage, washing, decontamination, or disposal.~~

~~I. *Gloves*. Gloves shall be worn when it can be reasonably anticipated that the employee may have hand contact with blood, other potentially infectious materials, mucous membranes, and nonintact skin; when performing vascular access procedures; and when handling or touching contaminated items or surfaces.~~

~~1. Disposable (single-use) gloves, such as surgical or examination gloves, shall be replaced as soon as practical when contaminated or as soon as feasible if they are torn, punctured, or their ability to function as a barrier is compromised.~~

~~2. Disposable (single-use) gloves shall not be washed or decontaminated for reuse.~~

~~3. Utility gloves may be decontaminated for reuse if the integrity of the gloves is not compromised. However, they must be discarded if they are cracked, peeling, torn, punctured, or exhibit other signs of deterioration or when their ability to function as a barrier is compromised.~~

~~***Housekeeping:***~~

~~A. *General*. The work site must be maintained in a clean and sanitary condition. The District shall establish, attach hereto, and implement an appropriate written schedule for cleaning and the method of decontamination based upon the location within the facility, type of surface to be cleaned, type of soil present, and tasks or procedures being performed in the area.~~

~~B. All school activity areas are cleaned daily.~~

~~C. In cleaning operations involving human blood, a cleaning solution consisting of ten to one (10:1) ratio of water and bleach will be used.~~

~~D. All equipment and environmental and working surfaces shall be cleaned and decontaminated after contact with blood or other potentially infectious materials.~~

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~~1. Contaminated work surfaces shall be decontaminated with an appropriate disinfectant after completion of procedures, immediately or as soon as feasible when surfaces are overtly contaminated or after any spill of blood or other potentially infectious materials, and at the end of the work shift if the surface may have become contaminated since the last cleaning.~~

~~2. Protective coverings - such as plastic wrap, aluminum foil, or imperviously backed absorbent paper used to cover equipment and environmental surfaces - shall be removed and replaced as soon as feasible when they become overtly contaminated or at the end of the work shift if they may have become contaminated during the shift.~~

~~3. All bins, pails, cans, and similar receptacles intended for reuse that have a reasonable likelihood of becoming contaminated with blood or other potentially infectious materials shall be inspected and decontaminated on a regularly scheduled basis and cleaned and decontaminated immediately or as soon as feasible upon visible contamination.~~

~~4. Broken glassware that may be contaminated shall not be picked up directly with the hands. It shall be cleaned up using mechanical means such as a brush and dust pan, tongs, or forceps.~~

~~5. Reusable sharps that are contaminated with blood or other potentially infectious materials shall not be stored or processed in a manner that requires employees to reach by hand into the containers where these sharps have been placed.~~

~~E. *Regulated waste*:~~

~~1. Contaminated sharps discarding and containment:~~

~~a. Contaminated sharps shall be discarded immediately or as soon as feasible in containers that are:~~

~~I. Closable.~~

~~II. Puncture resistant.~~

~~III. Leakproof on sides and bottom.~~

~~IV. Labeled or color coded.~~

~~b. During use, containers for contaminated sharps shall be:~~

~~I. Easily accessible to personnel and located as close as is feasible to the immediate area where sharps are used or can be reasonably anticipated to be found (e.g., laundries).~~

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~~II. Maintained upright throughout use.~~

~~III. Replaced routinely and not be allowed to overfill.~~

~~c. When moving containers of contaminated sharps from the area of use, the containers shall be:~~

~~I. Closed immediately prior to removal or replacement to prevent spillage or protrusion of contents during handling, storage, transport, or shipping.~~

~~II. Placed in a secondary container if leakage is possible. The second container shall be:~~

~~i. Closable.~~

~~ii. Constructed to contain all contents and prevent leakage during handling, storage, transport, or shipping.~~

~~iii. Labeled or color coded.~~

~~d. Reusable containers shall not be opened, emptied, or cleaned manually or in any other manner that would expose employees to the risk of percutaneous injury.~~

~~2. Other regulated waste containment:~~

~~a. Regulated waste shall be placed in containers that are:~~

~~I. Closable.~~

~~II. Constructed to contain all contents and prevent leakage of fluids during handling, storage, transport, or shipping.~~

~~III. Labeled or color coded.~~

~~IV. Closed prior to removal to prevent spillage or protrusion of contents during handling, storage, transport, or shipping.~~

~~b. If outside contamination of the regulated waste container occurs, it shall be placed in a second container. The second container shall be:~~

~~I. Closable.~~

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~~II. Constructed to contain all contents and prevent leakage of fluids during handling, storage, transport, or shipping.~~

~~III. Labeled or color coded.~~

~~IV. Closed prior to removal to prevent spillage or protrusion of contents during handling, storage, transport, or shipping.~~

~~3. Disposal of all regulated waste shall be in accordance with applicable regulations of the United States, states, territories, and political subdivisions of states and territories.~~

~~F. *Laundry*:~~

~~1. Contaminated laundry shall be handled as little as possible, with a minimum of agitation.~~

~~a. Contaminated laundry shall be bagged or containerized at the location where it was used and shall not be sorted or rinsed in the location of use.~~

~~b. Contaminated laundry shall be placed and transported in bags or containers labeled or color coded. When a facility utilizes universal precautions in the handling of all soiled laundry, alternative labeling or color coding is sufficient if it permits all employees to recognize the containers as requiring compliance with universal precautions.~~

~~c. Whenever contaminated laundry is wet and presents a reasonable likelihood of soak-through of or leakage from the bag or container, the laundry shall be placed and transported in bags or containers that prevent soaking-through and/or leakage of fluids to the exterior.~~

~~2. Employees who have contact with contaminated laundry must wear protective gloves and other appropriate personal protective equipment.~~

~~3. When a facility ships contaminated laundry off-site to a second facility, which does not utilize universal precautions in the handling of all laundry, the facility generating the contaminated laundry must place such laundry in bags or containers that are labeled or color-coded.~~

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~~Hepatitis B Vaccination and Postexposure Evaluation and Follow-up~~

~~General:~~

~~A. **The District shall make available the hepatitis B vaccine and vaccination series to all employees who have occupational exposure, and postexposure evaluation and follow-up to all employees who have had an exposure incident**.~~

~~B. The District requires that all medical evaluations and procedures, including the hepatitis B vaccine, and vaccination series and postexposure evaluation and follow-up, including prophylaxis, are:~~

~~1. Made available at no cost to the employee.~~

~~2. Made available to the employee at a reasonable time and place.~~

~~3. Performed by or under the supervision of a licensed physician or by or under the supervision of another licensed health care professional.~~

~~4. Provided according to recommendations of the U.S. Public Health Service current at the time these evaluations and procedures take place, except as specified in this section on hepatitis B vaccination and postexposure evaluation and follow-up.~~

~~C. The District requires that all laboratory tests be conducted by an accredited laboratory at no cost to the employee.~~

~~Hepatitis B vaccination:~~

~~A. Hepatitis B vaccination shall be made available after the employee has received the training required and within ten (10) working days of initial assignment to all employees who have occupational exposure unless the employee has previously received the complete hepatitis B vaccination series, antibody testing has revealed that the employee is immune, or the vaccine is contraindicated for medical reasons.~~

~~B. The District shall not make participation in a prescreening program a prerequisite for receiving hepatitis B vaccination.~~

~~C. If the employee initially declines hepatitis B vaccination but at a later date while still covered under the standard decides to accept the vaccination, the District shall make available hepatitis B vaccination at that time.~~

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~~D. The District requires all employees who decline to accept hepatitis B vaccination that is offered to sign the following statement:~~

~~I understand that due to my occupational exposure to blood or other potentially infectious materials I may be at risk of acquiring hepatitis B virus (HBV) infection. I have been given the opportunity to be vaccinated with hepatitis B vaccine, at no charge to myself. However, I decline hepatitis B vaccination at this time. I understand that by declining this vaccine, I continue to be at risk of acquiring hepatitis B, a serious disease. If in the future I continue to have occupational exposure to blood or other potentially infectious materials and I want to be vaccinated with hepatitis B vaccine, I can receive the vaccination series at no charge to me.~~

~~E. If a routine booster dose(s) of hepatitis B vaccine is recommended by the U.S. Public Health Service at a future date, such booster dose(s) shall be made available.~~

~~***Postexposure evaluation and follow-up.*** Following a report of an exposure incident, the District shall make immediately available to the exposed employee a confidential medical evaluation and follow-up, including at least the following elements:~~

~~A. Documentation of the route(s) of exposure, and the circumstances under which the exposure incident occurred.~~

~~B. Identification and documentation of the source individual, unless the District can establish that identification is infeasible or prohibited by state or local law.~~

~~1. The source individual's blood shall be tested as soon as feasible, and after consent is obtained, in order to determine HBV and HIV infectivity. If consent is not obtained, the District shall establish that legally required consent cannot be obtained. When the source individual's consent is not required by law, the source individual's blood, if available, shall be tested and the result documented.~~

~~2. When the source individual is already known to be infected with HBV or HIV, testing for the source individual's known HBV or HIV status need not be repeated.~~

~~3. Results of the source individual's testing shall be made available to the exposed employee, and the employee shall be informed of applicable laws and regulations concerning disclosure of the identity and infectious status of the source individual.~~

~~C. Collection and testing of blood for HBV and HIV serological status:~~

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~~1. The exposed employee's blood shall be collected as soon as feasible and tested after consent is obtained.~~

~~2. If the employee consents to base-line blood collection, but does not give consent at that time for HIV serologic testing, the sample shall be preserved for at least ninety (90) days. If within ninety (90) days of the exposure incident the employee elects to have the base-line sample tested, such testing shall be done as soon as feasible.~~

~~D. Postexposure prophylaxis, when medically indicated, as recommended by the U.S. Public Health Service.~~

~~E. Counseling.~~

~~F. Evaluation of reported illnesses.~~

~~***Information provided to the health care professional:***~~

~~A. The health care professional responsible for the employee's hepatitis B vaccination shall be provided a copy of this document.~~

~~B. The health care professional evaluating an employee after an exposure incident shall be provided the following information:~~

~~1. A copy of this document.~~

~~2. A description of the exposed employee's duties as they relate to the exposure incident.~~

~~3. Documentation of the route(s) of exposure and circumstances under which exposure occurred.~~

~~4. Results of the source individual's blood testing, if available.~~

~~5. All medical records relevant to the appropriate treatment of the employee, including vaccination status, that are the District's responsibility to maintain.~~

~~***Health care professional's written opinion.*** The District shall obtain and provide the employee with a copy of the evaluating health care professional's written opinion within fifteen (15) days of the completion of the evaluation.~~

~~A. The health care professional's written opinion for hepatitis B vaccination shall be limited to whether hepatitis B vaccination is indicated for an employee and whether the employee has received such vaccination.~~

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~~B. The health care professional's written opinion for postexposure evaluation and follow-up shall be limited to the following information:~~

~~1. That the employee has been informed of the results of the evaluation.~~

~~2. That the employee has been told about any medical conditions resulting from exposure to blood or other potentially infectious materials that require further evaluation or treatment.~~

~~C. All other findings or diagnoses shall remain confidential and shall not be included in the written report.~~

~~***Medical record keeping.*** Medical records required by this standard shall be maintained.~~

~~**Communication of Hazards to Employees**~~

~~***Labels:***~~

~~A. Warning labels shall be affixed to containers of regulated waste, refrigerators and freezers containing blood or other potentially infectious material, and other containers used to store, transport, or ship blood or other potentially infectious materials, except as provided in law.~~

~~B. These labels shall contain the "biohazard" label.~~

~~C. These labels shall be fluorescent orange or orange-red or predominantly so, with lettering or symbols in a contrasting color.~~

~~D. Labels are required to be affixed as close as feasible to the container by string, wire, adhesive, or other method that prevents their loss or unintentional removal.~~

~~E. Red bags or red containers may be substituted for labels.~~

~~F. Containers of blood, blood components, or blood products that are labeled as to their contents and have been released for transfusion or other clinical use are exempted from the labeling requirements of this section on communication of hazards to employees.~~

~~G. Individual containers of blood or other potentially infectious materials that are placed in a labeled container during storage, transport, shipment, or disposal are exempted from the labeling requirements.~~

~~H. Labels required for contaminated equipment shall be in accordance with this section and shall also state which portions of the equipment remain contaminated.~~

~~I. Regulated waste that has been decontaminated need not be labeled or color coded.~~

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~~***Information and training:***~~

~~A. All employees with occupational exposure shall participate in a training program, which must be provided at no cost to the employees and during working hours.~~

~~B. Training shall be provided as follows:~~

~~1. At the time of initial assignment to tasks where occupational exposure may take place.~~

~~2. Within ninety (90) days after the effective date of the standard.~~

~~3. At least annually thereafter.~~

~~C. For employees who have received training on bloodborne pathogens in the year preceding the effective date of the standard, only training with respect to the provisions of the standard that were not included need be provided.~~

~~D. Annual training for all employees shall be provided within one (1) year of their previous training.~~

~~E. The District shall provide additional training when changes such as modification of tasks or procedures or institution of new tasks or procedures affects the employee's occupational exposure. The additional training may be limited to addressing the new exposures created.~~

~~F. Material appropriate in content and vocabulary to educational level, literacy, and language of employees shall be used.~~

~~G. The training program shall contain at a minimum the following elements:~~

~~1. An accessible copy of the regulatory text of this standard and an explanation of its contents.~~

~~2. A general explanation of the epidemiology and symptoms of bloodborne diseases.~~

~~3. An explanation of the modes of transmission of bloodborne pathogens.~~

~~4. An explanation of the District's Exposure Control Plan and the means by which the employee can obtain a copy of the written plan.~~

~~5. An explanation of the appropriate methods for recognizing tasks and other activities that may involve exposure to blood and other potentially infectious materials.~~

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~~6. An explanation of the use and limitations of methods that will prevent or reduce exposure, including appropriate engineering controls, work practices, and personal protective equipment.~~

~~7. Information on the types, proper use, location, removal, handling, decontamination, and disposal of personal protective equipment.~~

~~8. An explanation of the basis for selection of personal protective equipment.~~

~~9. Information on the hepatitis B vaccine, including information on its efficacy, safety, method of administration, the benefits of being vaccinated, and that the vaccine and vaccination will be offered free of charge.~~

~~10. Information on the appropriate actions to take and persons to contact in an emergency involving blood or other potentially infectious materials.~~

~~11. An explanation of the procedure to follow if an exposure incident occurs, including the method of reporting the incident and the medical follow-up that will be made available.~~

~~12. Information on the postexposure evaluation and follow-up that the District is required to provide for the employee following an exposure incident.~~

~~13. An explanation of the labels and/or color coding required.~~

~~14. An opportunity for interactive questions and answers with the person conducting the training session.~~

~~H. The person conducting the training shall be knowledgeable in the subject matter covered by the elements contained in the training program as it relates to the workplace that the training will address.~~

~~Record Keeping~~

~~Medical records:~~

~~A. The District shall establish and maintain an accurate record for each employee with occupational exposure as defined herein.~~

~~B. This record shall include:~~

~~1. The name and Social Security number of the employee.~~

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~~2. A copy of the employee's hepatitis B vaccination status, including the dates of all hepatitis B vaccinations and any medical records relative to the employee's ability to receive vaccination.~~

~~3. A copy of all results of examinations, medical testing, and follow-up procedures.~~

~~4. The District's copy of the health care professional's written opinion.~~

~~5. A copy of the information provided to the health care professional.~~

~~C. *Confidentiality*. The District shall ensure that employee medical records required by law are:~~

~~1. Kept confidential.~~

~~2. Not disclosed or reported, without the employee's express written consent, to any person within or outside the workplace, except as required by law.~~

~~D. The District shall maintain the records required by law for at least the duration of employment plus thirty (30) years.~~

~~Training records:~~

~~A. Training records shall include the following information:~~

~~1. The dates of the training sessions.~~

~~2. The contents or a summary of the training sessions.~~

~~3. The names and qualifications of persons conducting the training.~~

~~4. The names and job titles of all persons attending the training sessions.~~

~~B. Training records shall be maintained for three (3) years from the date on which the training occurred.~~

~~Availability:~~

~~A. The District shall ensure that all records required to be maintained shall be made available, upon request, to the Assistant Secretary of Labor and the Director of the Occupational Safety and Health Administration for examination and copying.~~

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~~B. Employee training records required by law shall be provided upon request for examination and copying to employees, to employee representatives, to the Director of the Occupational Safety and Health Administration, and to the Assistant Secretary of Labor.~~

~~C. Employee medical records required by law shall be provided upon request, for examination and copying, to the subject employee, to anyone having written consent of the subject employee, to the Director of the Occupational Safety and Health Administration, and to the Assistant Secretary of Labor.~~

~~***Transfer of records:***~~

~~A. The District shall comply with the legal requirements involving transfer of records.~~

~~B. If the District ceases to do business and there is no successor district to receive and retain the records for the prescribed period, the District shall notify the Director of the Occupational Safety and Health Administration, at least three (3) months prior to their disposal, and transmit them to the Director of the Occupational Safety and Health Administration, if required by the Director of the Occupational Safety and Health Administration to do so, within that three (3) month period.~~

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ADVISORY 980

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~~Measles (Rubeola)~~

~~It shall be a condition of employment that, unless exempted, all employees, including substitutes, shall present proof of immunity to rubeola (measles) prior to reporting for work.~~

~~Evidence of immunity to measles shall consist of:~~

> ~~A. A record of immunization against measles with a live virus vaccine given on or after the first birthday; or~~
>
> ~~B. A statement, signed by a licensed physician or a state or local health officer, that affirms serologic evidence of having had measles.~~
>
> ~~C. Anyone born prior to January 1, 1957 shall be considered to be immune to measles. (Rubeola)~~

~~German Measles (Rubella)~~

~~Similarly, unless exempted, all employees, including substitutes, shall present proof of immunity to rubella (German measles) prior to reporting for work.~~

~~Evidence of immunity to rubella shall consist of:~~

> ~~A. A record of immunization against rubella given on or after the first birthday; or~~
>
> ~~B. A statement, signed by a licensed physician or a state or local health officer, that affirms serologic evidence of having had rubella.~~

~~General Information~~

~~Exempted employees include those with medical contraindications for receiving vaccines and those who refuse immunization for religious reasons.~~

~~Nonimmune employees, including those who utilize the exemption, shall, in the event of an outbreak of either disease, be put on leave without pay, or they may use accumulated sick leave during the period they are excluded from work due to the outbreak. If a staff member does not have any earned sick leave, a salary deduction of one (1) contract day will be made for each day of authorized leave used.~~

~~Adopted: _____~~

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~~LEGAL REF.:~~
~~A.R.S.~~
~~36-624~~
~~A.A.C.~~
~~R9-6-347~~
~~R9-6-360~~
~~R9-6-704~~
~~A.G.O.~~
~~I88-037~~

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~~REGULATION~~

~~WELLNESS PROGRAMS~~

~~Unless legally exempted, all staff members must show proof of immunity to measles and rubella [see GBGCA].~~

~~Measles (Rubeola)~~

~~Acceptable proof of immunity to measles shall consist of:~~

~~A. A record of immunization against measles with a live virus vaccine given on or after the first birthday; or~~

~~B. A statement, signed by a licensed physician or a state or local health officer, that affirms serologic evidence of having had measles.~~

~~C. Anyone born prior to January 1, 1957 shall be considered to be immune to measles. (Rubeola)~~

~~German Measles (Rubella)~~

~~Evidence of immunity to rubella shall consist of:~~

~~A. A record of immunization against rubella given on or after the first birthday; or~~

~~B. A statement, signed by a licensed physician or a state or local health officer, that affirms serologic evidence of having had rubella.~~

~~General Information~~

~~*In the event of an outbreak of either disease, memory of immunization date is not acceptable; medical documentation of immunity is required.*~~

~~Staff members who are not in compliance shall be put on leave without pay until they are in compliance.~~

~~In the event of an outbreak of measles or rubella, nonimmune staff members, including those who utilize the exemption, must be excluded from school.~~

~~Implementing Policy~~

~~The District shall generate a list of all employees to identify those who need proof of immunity to measles.~~

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~~The Superintendent shall distribute information about the District's policy on measles and rubella.~~

~~The Superintendent shall collect proof of immunity from staff members and compile a list denoting immunity or nonimmunity of staff members.~~

~~Nonimmune staff members shall be referred for vaccine to a physician or the County Health Department. Their records will be updated as they receive vaccine.~~

~~Maintaining Policy~~

~~Throughout each school year, new staff members shall be required to show proof of immunity before employment.~~

~~A list of nonimmune employees shall be maintained and updated throughout the year.~~

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~~GBGCB ©~~
~~STAFF HEALTH AND SAFETY~~

~~(Communicable Diseases)~~

~~It is the policy of the School District to take reasonable and lawful measures to protect students and staff members from the transmission of communicable diseases. The Superintendent is authorized to adopt such procedures as are necessary to implement this policy in a manner consistent with state and federal laws.~~

~~Prohibition on COVID-19 Vaccination and Mask or Face Coverings~~

~~The School District shall not:~~

> ~~A. Require a resident of this state to receive a vaccination for COVID-19 or any variant of COVID-19.~~
>
> ~~B. Impose any requirement to wear a mask or face covering anywhere on the School District's premises, except where long-standing workplace safety and infection control measures unrelated to COVID-19 may be required. See GBGB-R for a list of long-standing workplace safety control measures.~~

~~Exclusion from School~~

~~A staff member who has a communicable disease shall be excluded from school only if the staff member presents a direct threat to the health or safety of others in the school workplace. The outbreak control measures, and other directives of the Department of Health Services (DHS) and local health agencies shall be acted upon as the best medical knowledge and judgments with regard to the exclusion of a staff member who has a communicable disease that is addressed by DHS regulations. The communicable diseases specifically addressed by DHS regulations are listed at A.A.C. R9-6-203 *et seq*.~~

~~A staff member who has a chronic communicable disease, such as tuberculosis or HIV/AIDS, shall not be excluded unless a significant risk is presented, to the health and safety of others, which cannot be eliminated by reasonable accommodation. The Superintendent shall consult with legal counsel and health professionals, as necessary, to ensure that exclusion of a staff member with a chronic communicable disease will not violate the staff member's rights under the Americans with Disabilities Act or Section 504 of the Rehabilitation Act.~~

~~The school nurse or other person designated by the Superintendent must reassess a staff member who is excluded from school because of a communicable disease before the staff member returns to work. The District may require a physician's written medical release as a condition for the staff member's return to work.~~

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~~Reporting and Notification~~

~~The District shall report by telephone to its local health agency each diagnosed and suspected case of a communicable disease as set out in Regulation JLCB-R.~~

~~If an outbreak of a communicable disease occurs in a school setting, the Superintendent or the school nurse shall promptly inform staff members who are known to have special vulnerability to infection. The District does not assume any duty to notify an employee of health risks caused by the presence of a communicable disease in the school setting unless the at-risk employee has notified the District of the conditions when notification is needed.~~

~~Confidentiality~~

~~The District shall make reasonable efforts to maintain the confidentiality of staff members' medical conditions. All medical information relating to employees is confidential. The identity of a staff member who has a communicable disease and/or the nature of the communicable disease may be disclosed only to:~~

> ~~A. Staff members who must have such information to carry out their duties under this policy; or~~
>
> ~~B. Staff members or students (or their parents/guardians) who must have such information to protect themselves from direct threat to their health or safety.~~

~~Inquiries or concerns by staff members or others regarding communicable diseases or a staff member who is known or believed to have a communicable disease shall be directed to the Superintendent or the school nurse.~~

~~Universal Precautions~~

~~The District shall follow the "Universal Precautions Standard" set forth in the attached Exhibit GBGCB-E to protect employees who are at risk of being exposed to blood and body fluids in the course of their work.~~

~~Food Service Workers~~

~~The District shall follow the guidance of the U.S. Department of Health and Human Services concerning infectious and communicable diseases transmitted through the handling of food, and special precautions required for food services workers.~~

~~HIV/AIDS~~

~~Current medical information indicates that HIV can be transmitted by sexual intercourse with an infected partner, by injection of infected blood products, and by transmission from an infected mother to her child in utero or during the birth process. None of the identified cases of HIV infection in the United States are known to have been transmitted in a school setting or through any other casual person-to-person contact. There is no evidence that HIV is spread by sneezing, coughing,~~

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~~shaking hands, hugging, or sharing toilets, food, water, or utensils. According to best medical knowledge and judgments, the use of the "universal precautions" and other procedures that implement this policy are sufficient to protect staff members and students from transmission of HIV at school.~~

~~Adopted: _____~~

~~LEGAL REF.:~~
~~A.R.S.~~
~~36-621~~
~~36-624~~
~~36-681~~
~~36-685~~
~~A.A.C.~~
~~R9-6-203 *et seq.*~~
~~R9-6-355~~
~~29 U.S.C. 794 *et seq.*, Rehabilitation Act, (Section 504)~~
~~42 U.S.C. 12101 *et seq.* (Americans with Disabilities Act)~~
~~29 C.F.R. 1630.1 *et seq.* (ADA guidelines)~~
~~29 C.F.R. 1910.10 *et seq.* (OSHA Universal Precautions Standard)~~

~~CROSS REF.:~~
~~GBGC - Employee Assistance~~
~~GBGCA - Wellness Programs~~
~~JLCB-R - Immunizations of Students~~

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~~EXHIBIT~~

~~STAFF HEALTH AND SAFETY~~

~~COMMUNICABLE DISEASES~~

~~Handling Body Fluids in School~~

~~The following guidelines are meant to provide simple and effective precautions against transmission of disease for all people potentially exposed to the blood or body fluids of any person (student and/or school employee). No distinction is made between body fluids from persons with a known disease or those from persons without symptoms or with an undiagnosed disease.~~

~~The body fluids of all people should be considered to contain potentially infectious agents. The term *body fluids* includes blood, semen, drainage from scrapes and cuts, feces, urine, vomit, respiratory secretions (such as nasal discharge), and saliva.~~

~~A. Whenever possible, avoid direct skin contact with body fluids. Disposable gloves are recommended when direct hand contact with body fluids is anticipated. If extensive contact is made with body fluids, hands must be washed afterwards. Gloves used for this purpose should be put in a plastic bag, secured, and disposed of daily.~~

~~B. If direct skin contact does occur, hands and other affected skin areas of all exposed people shall be routinely washed with soap and water.~~

~~C. Proper handwashing requires the use of soap and water and vigorous washing under a stream of running water for approximately ten (10) seconds.~~

~~D. Clothing and other nondisposable items that are soaked through with body fluids should be rinsed and placed in plastic bags. If presoaking is required to remove stains, rinse or soak the item in cold water prior to bagging. Clothing should be sent home with the student for washing, with appropriate directions to parents and teachers (*see laundry instructions below*). Always wear gloves when handling items that have come in contact with body fluids.~~

~~E. Contaminated disposable items shall be handled with disposable gloves, put in a plastic bag, secured, and disposed of daily.~~

~~F. Body fluid spills on hard surfaces (i.e., floors, countertops, books, et cetera) shall be disinfected with bleach (diluted to ten [10] parts water and one [1] part bleach). Gloves shall always be worn during cleanup.~~

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~~G. Cleaning equipment:~~

~~1. Nondisposable cleaning equipment (such as dust pans, brooms, and buckets) shall be disinfected by thoroughly rinsing in diluted bleach (ten [10] parts water and one [1] part bleach). Mops shall be soaked in the disinfectant after use and then rinsed with hot water. The disinfectant solution shall be promptly disposed of down a drain pipe.~~

~~2. Disposable cleaning equipment (such as paper towels, the vacuum bag, or sweepings) shall be placed in plastic bags, secured, and disposed of daily. No special handling is required for vacuuming equipment. Gloves shall always be used during cleanup.~~

~~H. Laundry instructions:~~

~~Clothing soaked with body fluids shall be washed separately from other items. Presoaking may be required for heavily soiled clothing. Otherwise, wash and dry as usual. If the material can be bleached, add one-half (1/2) cup of household bleach to the wash cycle. If the material is not colorfast, add one-half (1/2) cup of all-fabric bleach to the wash cycle.~~

~~LEGAL REF.:~~
~~A.R.S.~~
~~36-621 *et seq.*~~
~~A.A.C.~~
~~R9-6-101 *et seq.*~~

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ADVISORY 982

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WORKERS' COMPENSATION

All employees shall be covered by workers' compensation insurance for any personal injury by accident while on assignment, including a~~n~~ personal injury by accident on school property or while on official business off school property. An employee must report any such accident to the supervisor's office immediately, since a report on the time of the accident, persons involved, and how it happened is required.

Adopted: _____

LEGAL REF.:
A.R.S.
15-505
23-901
23-902
23-904
23-906
23-908
23-961
23-962

CROSS REF.:
EBBB - Accident Reports
~~GBGC - Employee Assistance~~

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REGULATION

WORKERS' COMPENSATION

Process When Injured

Any employee who ~~has an~~ incurs a personal injury by accident, no matter how slight, while on duty shall notify the supervisor immediately. Failure to follow this procedure could result in the loss of workers' compensation benefits.

After being notified by an employee, the supervisor shall complete and submit the Report of Industrial Injury to the District office.

The Superintendent, upon receiving the supervisor's report, shall, within ten (10) days after notification, submit the Report of Industrial Injury to the insurance carrier and Industrial Commission of Arizona.

Compensation Claims

When a job-related personal injury~~/~~by accident requires medical attention and absence from the workplace, the following conditions shall apply:

A. The physician will be responsible for reporting the circumstances of the injury to the District, the Industrial Commission, and the District's insurance carrier.

B. During the first seven (7) days of absence due to a job-related injury~~/accident~~, the employee will be placed on sick leave, provided the employee has accumulated sufficient sick leave.

C. If a job-related injury~~/accident~~ results in more than seven (7) days absence, the insurance carrier will be responsible for handling the claim for lost pay. During such period the employee may be directed to:

1. Endorse over to the District the payments received from the insurance carrier, continue to receive a regular salary, and be charged sick leave. When the amount of the insurance payment is determined and received by the District, the employee's sick leave record will be adjusted for that fraction of the time paid by the insurance carrier (e.g., the insurance carrier pays one-half [1/2] of the normal salary of the employee, the sick leave will be adjusted on a pro rata basis); or

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2. Draw compensation from the insurance carrier, provide the District with a record of such payment, and receive payment for sick leave pay for the uncompensated portion of missed time, up to the limit of accumulated sick leave.

D. In no event will an employee receive a combined salary and worker's compensation in excess of the employee's regular salary.

E. An employee who has used all accumulated sick leave will be removed from the payroll and will receive only such amounts as are paid by the District's insurance carrier.

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EXHIBIT

WORKERS' COMPENSATION

EARLY RETURN TO WORK

Determining if a Job Offer can be Made for Early Return from an Illness or Injury

The District need only consider an early return when a job that can be performed by the early return employee is available. Creation of a position is not required.

When considering an early return assignment the District should:

A. Analyze the job and determine its purpose and essential functions.

B. Consult with the employee to determine the precise job limitations imposed by the attending physician.

C. Determine if the employee can perform the ~~duties~~ essential functions of the job with or without reasonable accommodation.

D. Analyze the risk of reinjury or deterioration of the employee's condition.

~~Adjustments in the job description for personal accommodations such as an amenity or convenience that is not job related shall not be the responsibility of the District. The District shall require that all aspects of the job description be performed adequately.~~ The District is not required to eliminate essential job functions. Reasonable accommodations will be provided where appropriate, consistent with the Americans with Disabilities Act and applicable workers' compensation law.

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ADVISORY 983

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~~STAFF~~ PARTICIPATION IN POLITICAL ACTIVITIES

The Board recognizes the right of its employees, as citizens, to engage in political activity. However, school time, personnel, equipment, supplies, materials, buildings, resources, or ~~other resources~~ any other thing of value of the District may not be used to influence the outcomes of elections.

An employee ~~staff member~~, a person acting on behalf of the District or a person who aids another person acting on behalf of the District shall be guided by the following:

A. No employee, while on duty, shall engage in political activities upon property under the jurisdiction of the Board.

B. The prohibition on the use of public resources to influence the outcome of bond, budget override and other tax-related elections includes the use of School District-focused promotional expenditures that occur after an election is called and through election day. This prohibition does not include routine School District communications which are messages or advertisements that are germane to the functions of the School District and that maintain frequency, scope and distribution consistent with past practices or are necessary for public safety.

C. Campaigning and other election activities must be done in off-duty hours, when not working in an official capacity or representing the District, and without the participation of District employees or students acting in the capacity of District or school representatives.

D. Invitations to participate in election activities on a given campus, except when extended by groups leasing or using school facilities, shall be permitted only when such invitations are to all candidates for the office. The rental use of District property by a private person or entity that may lawfully attempt to influence the outcome of an election is permitted if it does not occur at the same time and place as a related District-sponsored forum or debate.

E. Political circulars or petitions may not be posted or distributed in school.

F. The collection of campaign funds and/or the solicitation of campaign workers is prohibited on school property.

G. Students may not be given written materials to influence the outcome of an election or to advocate support for or opposition to pending or proposed legislation.

H. Students may not be involved in writing, addressing or distribution of material intended to influence the outcome of an election or to advocate support for or opposition to pending or proposed legislation.

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Employees of the District may not use the authority of their position to influence the vote or political activities of any subordinate employee.

District employees who hold elective or appointive office are not entitled to time off from their school duties for reasons incident to such offices, except as such time may qualify under the leave policies of the Board.

The discussion and study of politics and political issues, when such discussion and study are appropriate to classroom studies, are not precluded under the provisions of this policy.

District employees shall be permitted time as provided in statute, if required, to vote in the primary or general election.

The District may distribute informational reports on a proposed budget override election as provided in A.R.S. 15-481 and on a proposed bond election as provided in A.R.S. 15-491 if those informational reports present factual information in a neutral manner, except for those arguments allowed under A.R.S. 15-481.

Nothing in this policy shall preclude the District from producing and distributing impartial information on elections other than District budget override elections or reporting on official actions of the Governing Board.

The District shall not make expenditures for literature associated with a campaign conducted by or for a District official.

Adopted: _____

LEGAL REF.:
A.R.S.
15-481
15-491
15-511
15-903
16-402
A.G.O.
I15-002

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PERSONNEL RECORDS AND FILES

The District will maintain a complete and current official personnel file for each District employee.

Employee Responsibilities

~~Professional~~ Certificated employees are required to supply the District office with current and complete official transcripts of all college credits.

It is the duty and responsibility of each certificated employee to keep such certification current. ~~The District will maintain a complete and current official personnel file for each District employee.~~

Disciplinary/Derogatory Information

Records reasonably necessary or appropriate to maintain an accurate knowledge of disciplinary actions regarding employees and the employee responses will be maintained. Disciplinary action records shall be open to inspection and copying unless such inspection and disclosure of records or information in the records is contrary to law.

Employees will be advised of, and will be permitted to review and comment on, all information of a derogatory nature to be placed in their respective personnel files. The employee may prepare a written reply to such information, and such reply, if any, will be appended to the information in the file.

~~Records reasonably necessary or appropriate to maintain an accurate knowledge of disciplinary actions regarding staff members and the staff members' responses will be maintained. Disciplinary action records shall be open to inspection and copying unless such inspection and disclosure of records or information in the records is contrary to law.~~

Confidentiality

The District may create such subfiles within a personnel file as are appropriate to ensure confidentiality of those files made confidential by law and efficient use of the file. Access to personnel files will be limited to authorized District officials and employees authorized to handle personnel files. Individual Board members may only inspect confidential staff files when specifically authorized by the Board, as evidenced by action of a quorum of the Board in a legal meeting properly noticed.

Employees may review their own files by making written requests to the Superintendent. Materials obtained prior to an employee's employment, such as confidential recommendations or interview notes, will not be available for review by the employee.

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Documents within a personnel file may be reviewed by the public only to the extent that disclosure is compelled as a public record.

Per A.R.S. 15-537, copies of the evaluation report and performance classification of a certificated teacher retained by the governing board and the department of education are confidential, do not constitute a public record and shall not be released or shown to any person except: 1) the certificated teacher; 2) authorized district officers and employees; 3) to school districts and charter schools; 4) any relevant court action.

Personal Identifying Information

Unless otherwise specifically provided by law, a school district shall not:

A. Use an individual's social security number on forms of identification.

B. Transmit to another individual material that contains both the individual's social security number and the individual's financial institution account number. This does not preclude the transmission of documents of enrollment, amendment, termination, or contracting for financial services nor does it preclude transmitting documents confirming the accuracy of the numbers previously submitted.

The Superintendent shall prepare procedures to implement this policy and A.R.S. 44-1373 which restricts use of personal identifying information.

~~Documents within a personnel file may be reviewed by the public only to the extent that disclosure is compelled as a public record.~~

Adopted: _____

LEGAL REF.:
A.R.S.
15-302
15-502
15-537
23-926
23-1361
23-1362
38-233
39-121 *et seq*.
41-1482
44-1373

CROSS REF.:
DKA - Payroll Procedures/Schedules
KDB - Public's Right to Know/Freedom of Information

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~~EXHIBIT~~ REGULATION

PERSONNEL RECORDS AND FILES

A person or entity shall not, unless specifically provided by law:

A. Intentionally communicate or make an individual's social security number available to the general public.

B. Print an individual's social security number on any card required for the individual to receive services.

C. Require the transmission of an individual's social security number over the internet unless providing a secure connection or the social security number is encrypted.

D. Require the use of an individual's social security number to access a web site unless a password or unique personal identification number or other authentication device is also required to access the site.

E. Print a number that the person or entity knows to be an individual's social security number on any materials that are mailed to the individual unless required by law to place these numbers on the material.

1. This does not preclude the transmission of documents of enrollment, amendment, termination, or contracting for financial services nor does it preclude transmitting documents confirming the accuracy of the numbers previously submitted.

2. No requirement is made to check third party submitted numbers and unless the recipient of the number has actual knowledge that the number is or includes the individual's social security number, the person or entity may print the number on materials that are mailed to the individual.

3. No prohibition on mailing the individual any copy or reproduction of a document that includes a social security number is made if the social security number was included on the original document before January 1, 2005.

4. The exception is that if a social security number has been used inconsistent with the use described above after January 1, 2005, so long as the usage is continuous, the person or entity may continue to use the number subject to the conditions below:

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a. If the use stops for any reason then the social security number cannot be used and the use reverts to the conditions ~~bulleted~~ listed above.

b. Each year the entity must provide the individual with an annual written disclosure of the individual's right to stop the use of the social security number as prohibited above.

c. If an individual requests in writing, the person or entity must stop using the number in any manner conflicting with the law. No fee or charge is allowed, and the entity shall not deny services to the individual because of the request.

The law does not prohibit the collection, use or release of a social security number required by the laws of this state or the United States or for internal verification or administrative purposes.

Unless otherwise provided by law, after January 1, 2005, documents or records recorded and made available on the recording entity's web site shall not contain more than five (5) numbers reasonably identifiable as part of a social security number and shall not contain financial account numbers. A penalty of five hundred dollars ($500) for each act of recording is possible.

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ADVISORY 985

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~~STAFF~~ GRIEVANCES

~~Effective communication between District employees, the administrative staff, and the Board is essential for proper operation of the schools.~~ The Governing Board may~~,~~ ~~therefore,~~ authorize~~s~~ the Superintendent to establish a grievance procedure for employees as the prescribed means of resolving grievances at the earliest date and the lowest possible administrative level.

Such procedure shall provide for Board review of any grievance that cannot be resolved at the administrative level. In such instances, the affected individual may request that the Governing Board review the situation. Such request shall be in writing and shall contain the basis for the appeal, including the act or acts out of which the grievance arose, identification of the Board policies and/or administrative regulations involved, and the remedy sought.

Within five (5) ~~working~~ business days following notification of the Superintendent's decision, any written request for appeal shall be submitted to the Superintendent for transmittal to the Board. The Governing Board, at a time of its choosing, shall review the grievance and issue a response within fifteen (15) ~~working~~ business days following such review.

The decision of the Governing Board is final.

Adopted: _____

LEGAL REF.:
A.R.S.
15-341
~~38-532~~

CROSS REF.:
ACAA - Title IX Sex Discrimination
JII - Student Concerns, Complaints and Grievances

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REGULATION

~~STAFF~~ GRIEVANCES

Definitions

A *grievance* is a complaint by a District employee alleging a violation or misinterpretation, as to the employee, of any District policy or regulation that directly and specifically governs the employee's terms and conditions of employment. The term *grievance* shall not apply to any matter for which the method of review is prescribed by law, or the Governing Board is without authority to act. The suspension or dismissal of employees is covered by statute and, therefore, is not a grievable matter. Assignment, reassignment, or transfer of an employee to another position or duties is not grievable beyond the Superintendent unless there is a reduction in compensation or the Superintendent requests that it go to the Board.

A *grievant* shall be any employee of the District filing a grievance.

Terms and conditions of employment means the hours of employment, the compensation therefor, including fringe benefits, and the employer's personnel policies directly affecting the employee. In the case of ~~professional~~ certificated employees, the term does not include educational policies of the District.

A *day* is any day during which the District conducts business.

The *immediate supervisor* is the lowest-level administrator having line supervisory authority over the grievant.

Timeline

A grievant must initiate a grievance within fifteen (15) business days of the date of the violation that is the basis for the grievance.

Informal Level

Before filing a formal written grievance, the grievant must attempt to resolve the matter by one (1) or more informal conferences with the immediate supervisor. The first of these informal conferences must be conducted within ten (10) business days after the employee knew, or should have known, of the act or omission giving rise to the grievance. A second or any subsequent conference must occur within five (5) business days after the initial informal conference, or any subsequent conference.

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Formal Level

Level I. Within fifteen (15) business days after the employee knew, or should have known, of the act or omission giving rise to the grievance, the grievant must present the grievance in writing to the immediate supervisor.

The grievance shall be a clear, concise statement of the circumstances giving rise to the grievance, a citation of the specific article, section, and paragraph of the policy or regulation that directly and specifically governs the employee's terms and conditions of employment that are alleged to have been violated, the decision rendered at the informal conference, and the specific remedy sought.

The immediate supervisor shall communicate a decision to the employee in writing within five (5) business days after receiving the grievance.

Within the above time limits either party may request a personal conference to attempt to resolve the matter.

Level II. In the event the grievant is not satisfied with the decision at Level I, the decision may be appealed to the Superintendent within five (5) business days after receipt of the decision.

The appeal shall include a copy of the original grievance, the decision rendered, and a clear, concise statement of the reasons for the appeal. The Superintendent shall communicate a decision within five (5) business days after receiving the appeal. Either the grievant or the Superintendent may request a personal conference within the above time limits.

Level III. If the grievant is not satisfied with the decision at Level II, the grievant may, within five (5) business days, submit an appeal in writing to the Superintendent for consideration by the Governing Board.

The decision by the Governing Board is final.

General Provisions

Section 1. Failure at any step of this procedure to appeal a grievance to the next step within the specified time limits shall be deemed an acceptance of the decision rendered at that step, and there shall be no further right of appeal. Failure to file a grievance within fifteen (15) business days after the employee knew, or should have known, of the circumstances upon which the grievance is based shall constitute a waiver of that grievance.

Section 2. The filing or pendency of any grievance under the provisions of this policy shall in no way operate to impede, delay, or interfere with the jurisdiction of the Governing Board or the Superintendent.

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EXHIBIT

~~STAFF~~ GRIEVANCES

LEVEL I GRIEVANCE FORM A

FORMAL GRIEVANCE PRESENTATION

To be completed by grievant within five (5) business days after the last informal conference but no later than fifteen (15) business days after the employee knew or should have known of the act or omission giving rise to the grievance.

Grievant _____ Date of last informal presentation _____

School _____ Immediate supervisor _____

Assignment _____

Policy or regulation alleged to have been violated _____

Statement of grievance:

Action requested:

_____
Signature of grievant

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EXHIBIT

~~STAFF~~ GRIEVANCES

LEVEL I GRIEVANCE FORM B

DECISION OF IMMEDIATE SUPERVISOR

To be completed by immediate supervisor within five (5) business days after formal filing.

Grievant ____

Date of formal grievance presentation ______________________________

School ____

Immediate supervisor ______________________________________

Decision of immediate supervisor and reasons therefor:

Date of decision ________________ ______________________________
(Signature of immediate supervisor)

- -

Grievant's response [to be completed by the grievant within five (5) business days after the decision]:

☐ I accept the above decision of the immediate supervisor.

☐ I hereby refer the above decision to the Superintendent, with reasons detailing nonacceptance at Level I and any relief sought (Level II).

Date of response ________________ ______________________________
(Signature of grievant)

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EXHIBIT

~~STAFF~~ GRIEVANCES

LEVEL II GRIEVANCE FORM C

REFERRAL TO SUPERINTENDENT

To be completed by grievant within five (5) business days of immediate supervisor's response.

Grievant _____

Date of formal presentation _____

Detail reasons for nonacceptance of grievance decisions and any relief sought:

☐ The attached grievance is hereby referred to the Superintendent.

Date of referral _____ _____
(Signature of grievant)

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EXHIBIT

~~STAFF~~ GRIEVANCES

LEVEL II GRIEVANCE FORM D

DECISION OF SUPERINTENDENT

To be completed by the Superintendent within five (5) business days.

Grievant _____

Date of formal grievance presentation _____

Date appeal received by Superintendent _____

Date hearing held by Superintendent (optional) _____

Decision of Superintendent and reasons therefor:

Date of decision _____ _____
(Signature of Superintendent)

Grievant's response [to be completed by grievant within five (5) business days after the decision]:

- ☐ I accept the above decision of the Superintendent.
- ☐ I hereby appeal to the Governing Board for a review of this grievance (Level III).

Date of response _____ _____
(Signature of grievant)

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EXHIBIT

~~STAFF~~ GRIEVANCES

LEVEL III (Final Action) GRIEVANCE FORM E

REVIEW BY GOVERNING BOARD

Grievant _____

Date of formal grievance receipt _____

- ☐ The attached grievance is hereby appealed to the Governing Board for a review.

Detail reasons for nonacceptance of grievance decision at Level II and any relief sought:

Date appeal received by Governing Board _____

BOARD RESPONSE:

- ☐ The Board affirms the Superintendent's response.
- ☐ Board rejects the Superintendent's response.
- ☐ Board modifies the Superintendent's response as follows:

[TO BE COMPLETED WITHIN FIFTEEN (15) ~~WORKING~~ BUSINESS DAYS OF REVIEW]

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ADVISORY 986

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~~PROHIBITED PERSONNEL PRACTICES~~
REPRISALS

Disclosure Protected

It is a prohibited personnel practice for any District employee, who has control over personnel actions, to take reprisals against another employee for a disclosure of a matter of public concern, by that other employee, to a public body when the employee believes there has been:

A. A violation of law.

B. Mismanagement, a gross waste of monies, or an abuse of authority.

An employee, or former employee, who believes that an adverse personnel action taken is the result of such person's disclosure of information under A.R.S. 38-532 shall make a complaint to the Board. The Board shall make a determination pursuant to the rules under A.R.S. 41-783.

Reporting Protected

A governing board or school district employee who has control over personnel decisions shall not take unlawful reprisal against an employee for good-faith reports about certificated personnel engaged in conduct involving minors that is reportable under A.R.S. 13-3620 (Reporting Child Abuse).

Unlawful reprisal means an action taken by a governing board that results in:

A. Disciplinary action.

B. Transfer or reassignment.

C. Suspension, demotion, or dismissal.

D. An unfavorable performance evaluation.

E. Other significant changes in duties or responsibility that are inconsistent with the employee's salary or employment classification.

Adopted: _____

LEGAL REF.:
A.R.S.
13-3620
15-213
15-514
23-425
38-532
41-783

CROSS REF.:
DJ - Purchasing Ethics
DJE - Bidding/Purchasing Procedures

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ADVISORY 987

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~~PROFESSIONAL STAFF POSITIONS~~

~~Professional staff positions are created only with the approval of the Board. The District will attempt to activate a sufficient number of positions to accomplish the District's goals and objectives.~~

~~Before recommending the establishment of any new position, the Superintendent will present a job description for the position that specifies the qualifications, the performance responsibilities, and the method by which the performance of such responsibilities will be evaluated. The establishment of any new position will require Governing Board approval.~~

~~The Superintendent will maintain a comprehensive and up-to-date set of job descriptions of all positions in the school system.~~

~~Adopted: _____~~

~~LEGAL REF.:~~
~~A.R.S.~~
~~15-501~~
~~15-502~~
~~15-503~~

~~CROSS REF.:~~
~~CCB - Line and Staff Relations~~

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~~PROFESSIONAL STAFF~~
~~CONTRACTS AND~~ COMPENSATION

Definitions

Administrator: any school district administrator except a school principal who devotes at least fifty percent (50%) of the principal's time to classroom teaching.

Certificated Teacher: a person who holds a certificate from the state board of education to work in the schools of this state and who is employed under contract in a school district in a position that requires certification except a psychologist or an administrator who devotes at least fifty percent (50%) of the person's time to classroom teaching.

Noncertificated Personnel: employees of the District who are not required by state law or by a District policy, regulation, or job description to possess *teaching certificates* from the Arizona Department of Education for the purpose of performing their jobs.

Compensation

Compensation Statement

~~Salaries in the District will be differentiated in relationship to duties and responsibilities.~~

~~The Superintendent will provide recommendations on salaries and fringe benefits to the Board.~~

~~The Board at any time may establish, within the budgetary constraints of the District, the salaries and benefits for all employees necessary for the succeeding year.~~

Every fiscal year, each School District employee will be provided with a total compensation statement that is broken down by category of benefit or payment and that includes, for that employee, at least all of the following:

A. Base salary and any additional pay.

B. Medical benefits and the value of any employer-paid portions of insurance plan premiums.

C. Retirement benefit plans, including social security.

D. Legally required benefits.

E. Any paid leave.

F. Any other payment made to or on behalf of the employee.

G. Any other benefit provided to the employee.

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Salaries and Benefits

Salaries within the District will be set in accordance with assigned duties and responsibilities. The Superintendent will recommend salary and benefit levels to the Governing Board.

Within budgetary limits, the Board at any time may establish employee salaries and benefits for the upcoming year and will review benefit offerings annually during the budget process. Adjustments may be made as needed to serve the best interests of the District.

Eligibility standards for benefits will also be determined by the Board each year.

Employment Status

Certificated

Reduction/Elimination. Subject to the terms of employment contracts, the Governing Board at any time may reduce salaries or eliminate certificated teachers in the District in order to effectuate economies in the operation of the District or to improve the efficient conduct and administration of the District's schools. Notice of a general salary reduction shall be given to each certificated teacher affected. These provisions do not apply to salary reductions from classroom site fund money.

Noncertificated

All noncertificated personnel are either term employees or at-will employees of the District.

Term employee. A term employee is a noncertificated staff member who is employed by the District pursuant to a written contract that specifies the duration of the employment contract, which shall not exceed one (1) year. All noncertificated staff members who are not term employees are at-will employees.

At-will employee. An at-will employee is a noncertificated staff member who is employed by the District for no specific term and who has no right of continued employment. The employment of an at-will employee may be terminated by action of the Governing Board without advance notice. No employee or Governing Board member shall have the authority to make any agreement or contract to the contrary or any agreement with an at-will employee for any specified period of time. No District policy or regulation or item within the District's handbook is intended to - and shall not operate to - create any property or contract rights inconsistent with the at-will employment status of noncertificated staff members.

Adopted: _____

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LEGAL REF.:
A.R.S.
15-341
15-501
15-502
15-503
15-544
15-977

CROSS REF.:
GCF - Professional Staff Hiring
GCO – Evaluations and Contracts ~~of Professional Staff Members~~

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ADVISORY 989

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~~PROFESSIONAL STAFF~~
~~SALARY SCHEDULES~~
SALARIES

Certificated

Administrators

The Board will enter into an individual contract with each member of the administrative staff commensurate with the requirements of the position. This contract shall describe the general services to be rendered by the employee in return for financial and other considerations. Additionally, the employee's job description, detailing the more specific performance responsibilities of the contracted position ~~and the mode of evaluating performance~~, ~~shall~~ may be incorporated into the contract by reference. All terms and conditions of contracts with administrative staff members are to conform with the requirements of the Arizona Revised Statutes.

Other Certificated Personnel

Salary Schedule

The salary schedule pertains to personnel holding provisional, basic, or standard certificates at the elementary or secondary levels.

Initial Placement on Salary Schedule. New teachers entering the system with prior teaching service, who have met academic and ~~professional~~ certificated qualifications for Arizona State Department of Education certification, will be given a maximum credit of _____ years for substantiated experience, i.e., placed on the _____ step of the salary schedule.

Verified previous experience recognized for the purpose of placement on the salary schedule is defined as any previous full-time certificated teaching in any public school. For a teacher to receive credit for previous teaching experience, the teacher must furnish the ~~office of the~~ Superintendent full information concerning the previous teaching records. When the experience has been verified, credit will be given by the District.

Days intended for participation in professional association activities are not to be compensated under an employee's contract or other employment agreements. For the purpose of this policy, ~~*professional*~~ *certificated association activities* for which compensation is not available do not include in-service training in the certificated employee's assigned area of employment.

Substitutes ~~s~~ Teachers

Pay for substitute teaching will be established by the Board.

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Extra-Duty

The Superintendent will recommend to the Board an extra-duty pay schedule each year for its review and action.

Advancement on Salary Schedule

Vertical and horizontal advancement on the salary schedule will be in accordance with the salary schedule currently in effect. Vertical advancement is limited to one (1) step per year.

~~Reasons for denial of~~ V~~v~~ertical advancement on the salary schedule may be withheld for reasons includ~~e~~ing but ~~are~~ not limited to the following:

A. ~~Lack of adequate disciplinary control~~ Failure to demonstrate effective classroom management and student discipline, as documented in formal evaluations.

B. ~~Insufficient effort and time given to assigned duties or failure to engage in a reasonable amount of extracurricular activity~~ Failure to meet assigned duties and responsibilities, including instructional preparation, attendance, and participation in required District activities.

C. ~~Lack of cooperation with the administration in carrying out adopted policies of the school~~ Failure to comply with adopted District policies, procedures, and administrative directives.

D. ~~Unprofessional conduct~~ Failure to maintain professional standards of conduct, as defined by Arizona law and Governing Board policy.

Other ~~Contract~~ Provisions

Any person who does not work the full term as set up by salary schedule shall be paid on a prorated basis for the number of days to be worked for the remainder of the school year; this shall include school days taught plus the number of days required for orientation.

For newly hired, critical, and difficult-to-fill certificated personnel positions placed on the teachers' salary schedule, differentials above the stated schedule may be paid.

A teacher who is or has been employed by or teaching at a charter school, and was previously employed by the School District, shall receive the benefits, protections, and preferences granted under A.R.S. 15-187.

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Noncertificated

Wages

Initial Placement

Wages for all new noncertificated personnel and for all currently employed personnel selected for another position in the District will be recommended by the Superintendent and approved by the Board at the time of employment. The Superintendent's recommendation will be based on consideration of the candidate's qualifications, relevant job experience, and years of District employment, if applicable.

Advancement

Advancements for regular twelve (12)-month employees are granted only at the beginning of each fiscal year. Annual increases may be withheld if it is determined the employee does not perform at the expected level or does not meet standards for the job.

An employee must work one (1) day more than one-half (1/2) of the year to receive an advancement in wages.

Supplementary Pay/Overtime

The Superintendent will recommend extra-duty pay each year for the Board's review and action.

Whenever applicable, pay for extra duty must be coordinated with regular pay in accordance with the requirements of the Fair Labor Standards Act.

Adopted: _____

LEGAL REF.:
A.R.S.
15-502
15-504
15-941

CROSS REF.:
GCCA - Types of Leaves
~~GCCE - Professional/Support Staff Conferences/Visitations/Workshops~~
GCO-R- Evaluations and Contracts ~~of Professional Staff Members~~

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ADVISORY 990

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~~SUPPLEMENTARY PAY PLANS~~

~~(Extra Duty Pay)~~

~~The Superintendent will recommend to the Board an extra-duty pay schedule each year for its review and action.~~

~~Adopted: _____~~

~~LEGAL REF.:~~
~~A.R.S.~~
~~15-502~~

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ADVISORY 991

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~~FRINGE BENEFITS~~

~~The Governing Board will review professional staff fringe benefits each year during the budget process and may modify the benefits to meet the best interest of the District.~~

~~Minimum standards of eligibility for fringe benefits will be determined by the Board annually.~~

~~Adopted: _____~~

~~LEGAL REF.:~~
~~A.R.S.~~
~~15-187~~
~~15-502~~

~~CROSS REF.:~~
~~DKB - Salary Deductions~~
~~GCBA - Professional Staff Salary Schedules~~

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~~LEAVES AND ABSENCES~~

~~(Absent Without Leave)~~

~~An employee shall be deemed "absent without leave" when absent from work because of:~~

~~A. A reason that conforms to a policy currently in effect but the maximum days provided for in that policy will be exceeded; or~~

~~B. A reason that does not conform to any policy currently in effect; or~~

~~C. Failure to report to work without prior notification to the Superintendent.~~

~~In no case shall an employee be compensated for time lost due to being absent without leave.~~

~~An employee who is absent from work without prior approval is subject to disciplinary action, as is one who was unable to obtain prior approval due to unusual circumstances and such approval is denied upon the employee's return.~~

~~Adopted: _____~~

~~LEGAL REF.:~~
~~A.R.S.~~
~~15-341~~

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ADVISORY 993

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~~SICK LEAVE~~
TYPES OF LEAVES

~~Sick leave for District personnel is a designated amount of compensated leave that is to be granted to a staff member who, through personal or family illness, injury, or quarantine, is unable to perform the duties assigned.~~

~~Each staff member shall be credited with a sick leave allowance at the rate of _____ (__) days per month up to ten (10) or twelve (12) days, determined by the number of months employed:~~

~~Twelve (12) month employment — twelve (12) days~~
~~Ten (10) month employment — ten (10) days~~

~~The unused portion of such allowance shall accumulate to a maximum of _____ (__) days, at which time no more sick leave can be accumulated. As accumulated sick leave days are used and drop below _____ (__) days, an eligible employee may again accumulate sick leave up to the maximum limit.~~

~~When a staff member exhausts all days of accumulated sick leave, an unpaid leave of absence must be requested, pursuant to District policy.~~

~~Sick leave of any staff member who does not serve a full school year shall be prorated at the rate of one (1) day per month.~~

~~If an employee does not wish to return to her duties following childbirth, an extended leave of absence must be requested, consistent with existing District policy.~~

~~Upon request, the staff member shall inform the Superintendent of the following:~~

~~A. Purpose for which sick leave is being taken.~~

~~B. Expected date of return from sick leave.~~

~~C. Where the staff member may be contacted during the leave.~~

~~Use of Earned Paid Sick Time~~

~~Earned paid sick time shall be provided to an employee by an employer for:~~

~~A. An employee's mental or physical illness, injury or health condition; an employee's need for medical diagnosis, care, or treatment of a mental or physical illness, injury or health condition; an employee's need for preventive medical care;~~

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~~B. Care of a family member with a mental or physical illness, injury or health condition; care of a family member who needs medical diagnosis, care, or treatment of a mental or physical illness, injury or health condition; care of a family member who needs preventive medical care;~~

~~C. Reasons related to child care, domestic violence, sexual violence, abuse or stalking, and legal services as described in A.R.S. 23-373.~~

~~Earned paid sick time shall be provided upon the request of an employee. Such request may be made orally, in writing, by electronic means or by any other means acceptable to the employer. When possible, the request shall include the expected duration of the absence.~~

~~When the use of earned paid sick time is foreseeable, the employee shall make a good faith effort to provide notice of the need for such time to the employer in advance of the use of the earned paid sick time and shall make a reasonable effort to schedule the use of earned paid sick time in a manner that does not unduly disrupt the operations of the employer.~~

~~An employer that requires notice of the need to use earned paid sick time where the need is not foreseeable shall provide a written policy that contains procedures for the employee to provide notice. An employer that has not provided to the employee a copy of its written policy for providing such notice shall not deny earned paid sick time to the employee based on non-compliance with such a policy.~~

~~An employer may not require, as a condition of an employee's taking earned paid sick time, that the employee search for or find a replacement worker to cover the hours during which the employee is using earned paid sick time.~~

~~Earned paid sick time may be used in the smaller of hourly increments or the smallest increment that the employer's payroll system uses to account for absences or use of other time.~~

~~For earned paid sick time of three (3) or more consecutive work days, an employer may require reasonable documentation that the earned paid sick time has been used for a purpose covered by A, B, or C, above. Documentation signed by a health care professional indicating that earned paid sick time is necessary shall be considered reasonable documentation for purposes of this section.~~

~~As defined in statute **(A.R.S. 23-371)**, "family member" means:~~

~~A. Regardless of age, a biological, adopted or foster child, stepchild or legal ward, a child of a domestic partner, a child to whom the employee stands *in loco parentis*, or an individual to whom the employee stood *in loco parentis* when the individual was a minor;~~

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~~B. A biological, foster, stepparent or adoptive parent or legal guardian of an employee or an employee's spouse or domestic partner or a person who stood *in loco parentis* when the employee or employee's spouse or domestic partner was a minor child;~~

~~C. A person to whom the employee is legally married under the laws of any state, or a domestic partner of an employee as registered under the laws of any state or political subdivision;~~

~~D. A grandparent, grandchild or sibling (whether of a biological, foster, adoptive or step relationship) of the employee or the employee's spouse or domestic partner; or~~

~~E. Any other individual related by blood or affinity whose close association with the employee is the equivalent of a family relationship.~~

~~***Notice:***~~

~~A. Employers shall give employees written notice of the following at the commencement of employment or by July 1, 2017, whichever is later: employees are entitled to earned paid sick time and the amount of earned paid sick time, the terms of its use guaranteed in statute, that retaliation against employees who request or use earned paid sick time is prohibited, that each employee has the right to file a complaint if earned paid sick time as required by statute is denied by the employer or the employee is subjected to retaliation for requesting or taking earned paid sick time, and the contact information for the commission where questions about rights and responsibilities under can be answered.~~

~~B. The notice required shall be in English, Spanish, and any language that is deemed appropriate by the Industrial Commission of Arizona.~~

~~C. The amount of earned paid sick time available to the employee, the amount of earned paid sick time taken by the employee to date in the year and the amount of pay the employee has received as earned paid sick time shall be recorded in, or on an attachment to, the employee's regular paycheck.~~

~~D. The Industrial Commission of Arizona shall create and make available to employers, in English, Spanish, and any language deemed appropriate by the commission, model notices that contain the information for employers' use in complying with the statute.~~

~~E. Employer violation of the notice requirements shall be subject to a civil penalty as prescribed in A.R.S. 23-364.~~

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~~***Accrual:***~~

~~A. Employees of an employer with fifteen (15) or more employees shall accrue a minimum of one (1) hour of earned paid sick time for every thirty (30) hours worked, but employees shall not be entitled to accrue or use more than forty (40) hours of earned paid sick time per year, unless the employer selects a higher limit.~~

~~B. Employees of an employer with fewer than fifteen (15) employees shall accrue a minimum of one (1) hour of earned paid sick time for every thirty (30) hours worked, but employees shall not be entitled to accrue or use more than twenty-four (24) hours of earned paid sick time per year, unless the employer selects a higher limit.~~

~~C. Earned paid sick time shall begin to accrue at the commencement of employment or on July 1, 2017, whichever is later. An employer may provide all earned paid sick time that an employee is expected to accrue in a year at the beginning of the year.~~

~~D. An employee may use earned paid sick time as it is accrued, except that an employer may require an employee hired after July 1, 2017, to wait until the ninetieth (90th) calendar day after commencing employment before using accrued earned paid sick time, unless otherwise permitted by the employer.~~

~~E. Employees who are exempt from overtime requirements under the Fair Labor Standards Act of 1938 (29 United States Code section 213(A)(1)) will be assumed to work forty (40) hours in each work week for purposes of earned paid sick time accrual unless their normal work week is less than forty (40) hours, in which case earned paid sick time accrues based upon that normal work week.~~

~~F. Earned paid sick time shall be carried over to the following year, subject to the limitations on usage indicated above for employees of employers with fifteen (15) or more employees and employees of employers with fewer than fifteen (15) employees. Alternatively, in lieu of carryover of unused earned paid sick time from one (1) year to the next, an employer may pay an employee for unused earned paid sick time at the end of a year and provide the employee with an amount of earned paid sick time that meets or exceeds the requirements in statute that is available for the employee's immediate use at the beginning of the subsequent year.~~

~~G. If an employee is transferred, but remains employed by the same employer, the employee is entitled to all earned paid sick time accrued and is entitled to use all earned paid sick time as provided in this section.~~

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~~H. When there is a separation from employment and the employee is rehired within nine (9) months of separation by the same employer, previously accrued earned paid time that had not been used shall be reinstated. Further, the employee shall be entitled to use accrued earned paid sick time and accrue additional earned paid sick time at the re-commencement of employment.~~

~~I. When a different employer succeeds or takes the place of an existing employer, all employees of the original employer who remain employed by the successor employer are entitled to all earned paid sick time they accrued when employed by the original employer, and are entitled to use earned paid sick time previously accrued.~~

~~J. At its discretion, an employer may loan earned paid sick time to an employee in advance of accrual by such employee.~~

~~Any employer with a paid leave policy, such as a paid time off policy, who makes available an amount of paid leave sufficient to meet the accrual requirements of this section that may be used for the same purposes and under the same conditions as earned paid sick time under this article is not required to provide additional paid sick time.~~

~~Nothing in statute shall be construed as requiring financial or other reimbursement to an employee from an employer upon the employee's termination, resignation, retirement or other separation from employment for accrued earned paid sick time that has not been used.~~

~~Retaliation Prohibited~~

~~It shall be unlawful for an employer or any other person to interfere with, restrain, or deny the exercise of, or the attempt to exercise, any right protected in statute.~~

~~An employer shall not engage in retaliation or discriminate against an employee or former employee because the person has exercised protected rights. Such rights include but are not limited to the right to request or use earned paid sick time pursuant to the statute; the right to file a complaint with the commission or courts or inform any person about any employer's alleged violation; the right to participate in an investigation, hearing or proceeding or cooperate with or assist the commission in its investigations of alleged violations and the right to inform any person of his or her potential rights.~~

~~It shall be unlawful for an employer's absence control policy to count earned paid sick time taken as an absence that may lead to or result in discipline, discharge, demotion, suspension, or any other adverse action.~~

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~~Protections of this section shall apply to any person who mistakenly but in good faith alleges violations of this policy based on the supporting statutes.~~

Leaves may be granted to employees by the Board based on state or federal law, policy, employee agreements and/or employment contracts.

Such leaves may include but are not limited to the following classifications:

Sick Leave

Earned Paid Sick Leave

Per A.R.S. 23-372, each employee shall accrue one (1) hour of earned paid sick time (EPST) for every thirty (30) hours worked. This includes full-time, part-time, and temporary employees. Employees who are exempt from overtime under the Fair Labor Standards Act (FLSA) are assumed to work forty (40) hours per week for EPST purposes, unless their normal week is less than forty (40) hours.

In districts with fifteen (15) or more employees, an employee shall not be entitled to accrue or use more than forty (40) hours of EPST per year, unless the district selects a higher limit.

In districts with fewer than fifteen (15) employees, an employee shall not be entitled to accrue or use more than twenty-four (24) hours of EPST unless the district selects the higher limit.

EPST is carried over to the following year, subject to the forty (40)-hour/twenty-four (24)-hour limits provided above. An employee who separates from employment but is rehired within nine (9) months is entitled to reinstatement of their previously accrued EPST.

A district may provide each employee with an EPST balance for immediate use at the beginning of the year, at the district's sole discretion.

The use of accrued EPST is provided in A.R.S. 23-373.

EPST rights and obligations may be modified pursuant to a valid collective bargaining agreement.

Communicable Disease Exposure/
Outbreak Exclusion

When an employee is excluded from the workplace due to a communicable disease outbreak response, or because the health authorities having jurisdiction determine the employee's presence in the community may jeopardize the health of others due to exposure to a communicable disease, the employee may use available accrued sick leave, consistent with A.R.S. 23-373.

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If the employee does not have accrued paid leave available, or chooses not to use available paid leave, the absence shall be addressed under *Leave of Absence Without Pay* or applicable leave provision of this policy, consistent with employment agreements and law.

Family and Medical Leave

The District shall comply with all components of the Family and Medical Leave Act (FMLA). Eligible employees are entitled up to twelve (12) or twenty-six (26) weeks of leave as designated in the FMLA. Any employee seeking to understand rights under FMLA may inquire with the benefits department in Human Resources, review posted materials, and/or review GCCA-RB.

Banked Sick Leave

A district may provide a mechanism for the voluntary transfer of accrued sick leave among employees.

Personal Leave

A district may grant leave for an employee's personal business, bereavement, religious observances, and other approved situations.

Crime Victim Leave

A district with fifty (50) or more employees as determined by law shall allow an employee leave if the employee is the victim of a juvenile or adult crime and is exercising a right to be present at a proceeding as defined in A.R.S. 8-420 and/or 13-4439. While the district is not required to compensate the employee when the employee leaves work to attend such proceedings, the district is prohibited from dismissing the employee or discriminating against the employee in compensation or other terms, conditions, or privileges of employment because the employee exercised their victim leave rights under A.R.S. 8-420 or 13-4439. Leave for this purpose may be limited if the leave creates an undue hardship to the employer's business.

Regardless of the number of employees employed by the District, EPST may also be used for certain absences occasioned by the employee or their family member having been the victim of domestic violence, sexual violence, abuse, or stalking. [A.R.S. 23-373(A)(4), (G), (H), and (I)]

Jury Duty Leave

Jury duty leaves of absence must be provided per A.R.S. 21-236.

Voting Leave

An employee may take time from work to vote in a primary or general election per A.R.S. 16-402.

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Military Leave

An employee who is a member of the Military Reserve or National Guard shall be entitled to leave of absence without loss of pay, time, or efficiency rating when engaged in field training up to the statutory limit [A.R.S. 26-168 and 38-610].

An employee who is a member of the uniformed service may use any vacation leave or other accumulated paid time off during their service or may take unpaid leave of absence.

The District must reemploy uniformed service members, as provided in 38 U.S.C. 4301 *et seq*., after returning from a period of service.

Holiday Leave

Employees shall be entitled to holidays and breaks as established by the Governing Board and noted on each year's school calendar, consistent with Arizona Revised Statutes. Uncompensated days off will be established by the Board and noted on each year's school calendar. When July 4, Veterans' Day, December 25, or Thanksgiving Day, occurs within the school week, the schools shall be closed, and the compensation of the teachers shall not be diminished on that account. The Governing Board may declare a recess during the Christmas holiday season not to exceed two (2) school weeks, and teachers shall receive compensation during the recess. [A.R.S. 15-801]

Vacation Leave

A district may grant vacation leave as it deems appropriate.

Sabbatical Leave

Sabbatical leave may be granted to certificated teaching and administrative personnel for a maximum of one (1) year when conforming to A.R.S 15-510 and other applicable Arizona Revised Statutes.

Professional Development Leave

To attend meetings or conferences, employees must obtain approval from the administration at least twenty (20) days prior to the meeting or conference dates (whenever such prior request is possible).

Leave of Absence Without Pay

The District recognizes that on occasion extenuating circumstances arise that may necessitate absence from duty that is not covered by other specific leave provisions of the District. To address such situations, a leave of absence, without pay, may be granted to certificated or noncertificated personnel for not longer than one (1) year when deemed reasonable, for good cause, and not detrimental to education within the School District.

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Requests for Leave

Each request for a leave of absence without pay shall be in a written application stating the purpose of the leave of absence, the starting date and duration of the leave of absence, the facts as to its necessity or advisability, and any other information the applicant deems relevant to the request.

Approval

A leave of absence requested pursuant to this policy may be:

A. Approved by the Superintendent if the leave period does not exceed twelve (12) weeks; or

B. Recommended by the Superintendent and approved by the Governing Board if the leave period exceeds twelve (12) weeks.

The leave of absence shall be only for the purpose and duration approved and may not be extended without written approval by the District.

Preservation of Rights for Continuing Certificated Teachers

In accordance with A.R.S. 15-510, all rights of retirement, accrued leave with pay, salary increments and other benefits provided by law shall be preserved and available to the continuing certificated teacher after the termination of the leave of absence.

Absent Without Leave

An employee shall be deemed "absent without leave" when absent from work because of:

A. A reason that conforms to a policy currently in effect, but the maximum days provided for in that policy will be exceeded; or

B. A reason that does not conform to any policy currently in effect; or

C. Failure to report to work without prior notification to the Superintendent.

Employees shall not be compensated for time lost due to being absent without leave.

An employee who is absent from work without prior approval is subject to disciplinary action, up to and including dismissal, in accordance with applicable law, Governing Board policy, and established District procedures.

Adopted: _____

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LEGAL REF.:
A.R.S.
8-386
8-420
13-4405
13-4439
15-187
15-341
15-502
15-510
15-801
16-402
21-236
23-363
23-364
23-371
23-372
23-373
23-374
23-375
26-168
38-608
38-610
38-615
29 U.S.C. 2601 *et seq.*
38 U.S.C. 4301 *et seq.*
29 CFR 825.100 *et seq.*

CROSS REF.:
GCBA - ~~Professional Staff Salary Schedules~~ Salaries

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REGULATION

TYPES OF LEAVES

(Sick Leave/Earned Paid Sick Time)

Use of Earned Paid Sick Time

Earned paid sick time shall be provided to an employee by an employer for:

A. An employee's mental or physical illness, injury or health condition or care for a family member with these conditions; an employee's need for medical diagnosis, care, or treatment of a mental or physical illness, injury or health condition or care for a family member with these conditions; an employee's need for preventive medical care or care for a family member with these conditions;

B. Reasons as described in A.R.S. 23-373 including but not limited to: public health emergency/exposure circumstances (including workplace closure or a child's school/place of care closure), domestic violence, sexual violence, abuse or stalking, and legal services.

Employee Request

Earned paid sick time shall be provided upon the request of an employee made orally, in writing, by electronic means or by any other means acceptable to the employer. When possible, the request shall include the expected duration of the absence.

The employee shall try to provide notice as early as possible and try to schedule the sick time so it disrupts District operations as little as possible.

If an employer requires notice from an employee needing to use earned paid sick time, even when the need was not foreseeable, the employer must provide a written policy of the required procedures for providing such notice. If this is not done, the employer cannot deny earned paid sick time because the employee did not follow the correct procedures.

An employee is not responsible for finding a replacement worker for an absence when using earned paid sick time.

Earned paid sick time may be used in the smallest hourly increments used by the District to account for absences or use of other time.

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If an employee requests paid sick time for three (3) or more consecutive work days, the District may request reasonable documentation (documentation signed by a health care professional) indicating that earned paid sick time is necessary. Reasonable documentation in cases of domestic violence, sexual violence, abuse or stalking, is provided in A.R.S. 23-373(G). An employer may not require that document explain the nature of the health condition or the details of the domestic violence, sexual violence, abuse or stalking.

Accrual of Earned Paid Sick Time

Accrual of earned paid sick time shall be determined in accordance with A.R.S. 23-372(D).

Per A.R.S. 23-372, the following guidelines shall be used in determining accrual of earned paid sick time.

Number of Employees:

A. Employees of a district with fifteen (15) or more employees shall accrue a minimum of one (1) hour of earned paid sick time for every thirty (30) hours worked, but employees shall not be entitled to accrue or use more than forty (40) hours of earned paid sick time per year, unless the District selects a higher limit.

B. Employees of a district with fewer than fifteen (15) employees shall accrue a minimum of one (1) hour of earned paid sick time for every thirty (30) hours worked, but employees shall not be entitled to accrue or use more than twenty-four (24) hours of earned paid sick time per year, unless the District selects a higher limit.

Number of employees should be determined in accordance with A.R.S. 23-372(C).

District Paid Leave

A district with a paid leave policy, such as a paid time off policy, that makes available an amount of paid leave sufficient to meet the accrual requirements listed above that may be used for the same purposes and under the same conditions as earned paid sick time under statute is not required to provide additional paid sick time.

Unused Sick Time

Nothing in statute shall be construed as requiring financial or other reimbursement to an employee from a district upon the employee's termination, resignation, retirement or other separation from employment for accrued earned paid sick time that has not been used.

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Notice:

A. A district shall give employees written notice of the following at the commencement of employment: employees are entitled to earned paid sick time and the amount of earned paid sick time, the terms of its use guaranteed in statute, that retaliation against employees who request or use earned paid sick time is prohibited, that each employee has the right to file a complaint if earned paid sick time as required by statute is denied by the District or the employee is subjected to retaliation for requesting or taking earned paid sick time, and the contact information for the Industrial Commission of Arizona where questions about rights and responsibilities under can be answered.

B. The notice required shall be in English, Spanish, and any language that is deemed appropriate by the Industrial Commission of Arizona.

C. The amount of earned paid sick time available to the employee, the amount of earned paid sick time taken by the employee to date in the year and the amount of pay the employee has received as earned paid sick time shall be recorded in, or on an attachment to, the employee's regular paycheck.

D. A district's violation of the notice requirements shall be subject to a civil penalty as prescribed in A.R.S. 23-364.

Retaliation Prohibited

It is unlawful for a district or any other person to interfere with, restrain, or deny the exercise of, or the attempt to exercise, any right protected in statute.

A district shall not engage in retaliation or discriminate against an employee or former employee because the person has exercised protected rights. Such rights include but are not limited to the right to request or use earned paid sick time pursuant to the statute; the right to file a complaint with the commission or courts or inform any person about a district's alleged violation; the right to participate in an investigation, hearing or proceeding or cooperate with or assist the commission in its investigations of alleged violations and the right to inform any person of his or her potential rights.

It shall be unlawful for a district's absence control policy to count earned paid sick time taken as an absence that may lead to or result in discipline, discharge, demotion, suspension, or any other adverse action.

Protections of this section shall apply to any person who mistakenly but in good faith alleges violations of this policy based on the supporting statutes.

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Definitions

As defined in statute (A.R.S. 23-371), "family member" means:

A. Regardless of age, a biological, adopted or foster child, stepchild or legal ward, a child of a domestic partner, a child to whom the employee stands *in loco parentis*, or an individual to whom the employee stood *in loco parentis* when the individual was a minor;

B. A biological, foster, stepparent or adoptive parent or legal guardian of an employee or an employee's spouse or domestic partner or a person who stood *in loco parentis* when the employee or employee's spouse or domestic partner was a minor child;

C. A person to whom the employee is legally married under the laws of any state, or a domestic partner of an employee as registered under the laws of any state or political subdivision;

D. A grandparent, grandchild or sibling (whether of a biological, foster, adoptive or step relationship) of the employee or the employee's spouse or domestic partner; or

E. Any other individual related by blood or affinity whose close association with the employee is the equivalent of a family relationship.

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REGULATION

TYPES OF LEAVES

(Family and Medical Leave Act)

Family and Medical Leave Act (FMLA) Leave

Regulations, Process and Forms

The District shall fully comply with the Family and Medical Leave Act in accordance with the requirements of federal law and guidance issued by the U.S. Department of Labor. All procedures, forms, and timelines shall conform to these requirements.

Information and resources regarding FMLA rights and responsibilities, including required forms, are available from the U.S. Department of Labor at:

https://www.dol.gov/agencies/whd/fmla

https://www.dol.gov/agencies/whd/fmla/forms

Number of Employees

FMLA applies to any employer that employs fifty (50) or more employees in twenty (20) or more workweeks in the current or preceding calendar year.

The employee must work at a location where the employer employs at least fifty (50) employees within seventy-five (75) miles.

All districts must post required FMLA information regardless of number of employees. Posters are available at the FMLA link above.

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REGULATION

TYPES OF LEAVES

(Professional Development)

The following guides will be used in granting released time and/or travel expense:

A. Value of the meeting or conference.

B. Funds available in the appropriate budgets.

C. Availability of a substitute, if one is necessary.

With prior approval, expenses associated with authorized employee attendance at meetings and conferences may be eligible for compensation in accordance with District Policy DKC. Staff member travel and expense for participation in student field trips and excursions shall be in accordance with District Policy IJOA.

Employee absences for attendance at or participation in professional association activities are not eligible for compensation under the employee's contract or work agreement. The District may authorize an employee to take other eligible unused accumulated compensated leave for a personal, professional, or other lawful purpose.

For the purpose of this policy, *professional association activities* for which compensation is not available do not include in-service training in the certificated employee's assigned area of employment.

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EXHIBIT

TYPES OF LEAVES

MILITARY / LEGAL LEAVE

Part 200 - Regulations Under the Uniformed Services Employment and Reemployment Rights Act of 1994 (Appendix to Part 1002 - Your Rights Under USERRA)

The Uniformed Services Employment and Reemployment Rights Act

USERRA protects the job rights of individuals who voluntarily or involuntarily leave employment positions to undertake military service or certain types of service in the National Disaster Medical System. USERRA also prohibits employers from discriminating against past and present members of the uniformed services, and applicants to the uniformed services.

Reemployment Rights

You have the right to be reemployed in your civilian job if you leave that job to perform service in the uniformed service and;

A. you ensure that your employer receives advance written or verbal notice of your service;

B. you have five (5) years or less of cumulative service in the uniformed services while with that particular employer;

C. you return to work or apply for reemployment in a timely manner after conclusion of service; and

D. you have not been separated from service with a disqualifying discharge or under other than honorable conditions.

If you are eligible to be reemployed, you must be restored to the job and benefits you would have attained if you had not been absent due to military service or, in some cases, a comparable job.

Right to be Free from Discrimination and Retaliation

If you:

A. are a past or present member of the uniformed service;

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B. have applied for membership in the uniformed service; or

C. are obligated to serve in the uniformed service;

then an employer may not deny you:

A. initial employment;

B. reemployment;

C. retention in employment;

D. promotion; or

E. any benefit of employment

because of this status.

In addition, an employer may not retaliate against anyone assisting in the enforcement of USERRA rights, including testifying or making a statement in connection with a proceeding under USERRA, even if that person has no service connection.

Health Insurance Protection:

A. If you leave your job to perform military service, you have the right to elect to continue your existing employer-based health plan coverage for you and your dependents for up to twenty-four (24) months while in the military.

B. Even if you don't elect to continue coverage during your military service, you have the right to be reinstated in your employer's health plan when you are reemployed, generally without any waiting periods or exclusions (e.g., pre-existing condition exclusions) except for service-connected illnesses or injuries.

Enforcement:

A. The U.S. Department of Labor, Veterans Employment and Training Service (VETS) is authorized to investigate and resolve complaints of USERRA violations.

B. For assistance in filing a complaint, or for any other information on USERRA, contact VETS at 1-866-4-USA-DOL or visit its website at http://www.dol.gov/agencies/vets/programs/userra. An interactive online USERRA Advisor can be viewed at https://webapps.dol.gov/elaws/vets/userra/.

C. If you file a complaint with VETS and VETS is unable to resolve it, you may request that your case be referred to the Department of Justice for representation.

D. You may also bypass the VETS process and bring a civil action against an employer for violations of USERRA.

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The rights listed here may vary depending on the circumstances. This notice was prepared by VETS, and may be viewed on the Internet at this address: http://www.dol.gov/vets/programs/userra/poster.htm.

Federal law requires employers to notify employees of their rights under USERRA, and employers may meet this requirement by displaying this notice where they customarily place notices for employees.

U.S. Department of Labor, Veterans
Employment and Training Service
Washington, DC 20210
1-866-487-2365

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ADVISORY 994

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~~PROFESSIONAL / SUPPORT STAFF~~
~~PERSONAL / EMERGENCY /~~
~~RELIGIOUS LEAVE~~

~~Each staff member will be granted personal leave not to exceed two (2) days per year. No more than ten percent (10%) of the staff or other groupings of employees may take personal leave at any one time. Requests for personal leave must be received at least four (4) working days prior to the first day of leave, and must be approved by the principal.~~

~~Requests shall be acted upon in order of receipt, and the availability of substitutes, if necessary, may limit the number of requests granted at any one (1) time.~~

~~Personal leave will not be granted during the following periods:~~

~~A. On the day immediately preceding or following a holiday or vacation.~~

~~B. During the first two (2) weeks of school or the last two (2) weeks of school.~~

~~Adopted: _____~~

~~LEGAL REF.:~~
~~A.R.S.~~
~~15-510~~

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ADVISORY 995

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~~GCCC ©~~
~~PROFESSIONAL / SUPPORT STAFF~~
~~LEAVES OF ABSENCE WITHOUT PAY~~

~~The District recognizes that on occasion extenuating circumstances arise that may necessitate absence from duty that is not covered by other specific leave provisions of the District. To address such situations, a leave of absence, without pay, may be granted a member of the certificated or support staff for not longer than one (1) year.~~

~~Leave of absence may be requested for, but not limited to, the following purposes:~~

> ~~A. For additional education that relates to the employee's primary assignment. A plan of contemplated course work must be presented.~~
>
> ~~B. To provide for an unpaid leave in a situation where the employee will be absent from work because of 1) a reason that conforms to a policy currently in effect but the maximum number of days provided for in that policy will be exceeded, or 2) failure to report to work without prior notification to the Superintendent.~~
>
> ~~C. For a leave of absence that benefits or is in the best interest of the District, as determined by the Board upon review of the application.~~
>
> ~~D. For leave under the Family and Medical Leave Act.~~

~~A leave of absence requested pursuant to this policy may be:~~

> ~~A. Approved by the Superintendent if the leave period does not exceed twelve (12) weeks; or~~
>
> ~~B. Recommended by the Superintendent and approved by the Governing Board if the leave period exceeds twelve (12) weeks.~~

~~A request for leave of absence shall not be denied by the District if the employee is entitled to the leave under the Family and Medical Leave Act. All other applications for leave of absence may be granted or denied by the District, in its sole discretion.~~

~~Each request for such a leave of absence shall be in a written application stating the purpose, starting date, and duration of the leave of absence, the reasons for its necessity or desirability, and any other information the applicant deems relevant to the request.~~

~~The leave of absence shall be only for the purpose and duration approved and may not be extended without written approval by the District.~~

~~All rights of continuing status (certificated teachers only), retirement, salary increments, and other benefits shall be restored at the level earned when the leave was granted. All accrued sick, vacation, personal, and other paid leave shall be applied to the leave period unless otherwise agreed to by the District or prohibited by the Family and Medical Leave Act.~~

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~~Family and Medical Leave Act (FMLA)~~

~~The District shall fully comply with the Family and Medical Leave Act and all interim and final regulations interpreting the FMLA issued by the U.S. Department of Labor. Accordingly, all portions of this policy that pertain to the FMLA shall be interpreted in a manner consistent with the FMLA and its regulations. Subject to the conditions set forth herein, any eligible employee of the District may take up to twelve (12) weeks of leave (FMLA leave) measured backward for each employee from the first time such employee uses leave under FMLA without pay, for any one (1) or more of the following reasons:~~

> ~~A. Because of the birth of a child of the employee and in order to care for such child.~~
>
> ~~B. Because of the placement of a child with the employee for adoption or foster care.~~
>
> ~~C. In order to care for the spouse or a son, daughter, or parent of the employee, if such person has a serious health condition.~~
>
> ~~D. Because of a serious health condition that makes the employee unable to perform the functions of the position of such employee.~~
>
> ~~E. Because of any qualifying exigency (as the Secretary shall, by regulation, determine) arising out of the fact that the spouse, or a son, daughter, or parent of the employee is on active duty (or has been notified of an impending call or order to active duty) in the Armed Forces in support of a contingency operation.~~

~~*An eligible employee* is one who has been employed by the District at least twelve (12) months and who has completed at least one thousand two hundred fifty (1,250) hours of service immediately prior to the time the FMLA leave is to commence.~~

~~*Serious health condition* means an illness, injury, impairment, or physical condition that involves inpatient care in a hospital, hospice, or residential medical facility, or outpatient care with continuing medical treatment by a licensed physician. Any employee who has been employed by the District at least twelve (12) months and who has completed at least one thousand two hundred fifty (1,250) hours of service immediately prior to the time the leave is to commence shall be eligible for FMLA leave.~~

~~***Special conditions applicable to FMLA.*** Entitlement to leave for the birth of a child or the placement of a child for adoption or foster care ends at the expiration of a twelve (12)-month period, beginning on the date of the event. An eligible employee who is the spouse, son, daughter, parent, or next of kin of a covered servicemember shall be entitled to a total of twenty-six (26) workweeks of leave during a twelve (12)-month period to care for the servicemember. The leave described to care for a covered servicemember shall only be available during one (1) single twelve (12)-month period.~~

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~~A husband and wife working for the District may be limited to a total of twelve (12) weeks of leave during each applicable twelve (12)-month period for leave for the birth of a child or the placement of a child for adoption or foster care and to care for an employee's parent with a serious health condition. The aggregate number of workweeks of leave to which both the husband and wife may be entitled under covered servicemember family leave combined with leave as described in the previous sentence shall be limited to twenty-six (26) workweeks during one (1) single twelve (12)-month period.~~

~~The District shall not require an employee to substitute accrued sick leave for FMLA leave used by reason of a birth, adoption, or foster placement. An employee shall substitute accrued vacation or personal leave for FMLA leave used by reason of a birth, adoption, or foster placement, to the extent available by policy, unless otherwise agreed to by the District. In any other circumstance, an employee's accrued sick, vacation, personal, or other applicable leave shall be substituted for FMLA leave, to the extent available by policy, unless otherwise agreed to by the District.~~

~~***Notice.*** An employee must provide at least thirty (30) days notice before the FMLA leave is to begin if the need for the leave is foreseeable based on an expected birth, placement for adoption, or foster care, planned medical treatment for a serious health condition, or military service leave of the employee or family member. If thirty (30) days notice is not practicable, notice must be given as soon as practicable. The notice shall be in the form of a request for leave of absence as specified in this policy. The District may deny FMLA leave to any eligible employee until such time as the employee has provided the required notice.~~

~~***Certification.*** All FMLA leave shall be supported by medical certificate provided by the employee's health provider in the form of the exhibit accompanying this policy. In any instance where the FMLA leave must be preceded by thirty (30) days notice, the medical certificate should accompany the request for leave of absence. In any other instance, the medical certificate should be provided within fifteen (15) days after the FMLA leave commences.~~

~~Certification of active military duty or call to active duty in support of a contingency operation for purpose of receiving family leave shall be required under the same conditions as FMLA certification for leave indicated above.~~

~~The employee may be requested (at the District's expense) to provide recertification of medical conditions in support of leave if the District feels that the circumstances so warrant and notice is given. Recertification shall not be required for intervals shorter than thirty (30) days.~~

~~Whenever a medical certification or recertification is required of an employee, notice describing such requirement and providing the form of such certification shall be provided to the employee. An employee shall not be denied FMLA leave or other rights under the FMLA unless a notice required by FMLA in such situation has first been provided to the employee.~~

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~~In the case of continuation, recurrence, or onset of a serious health condition to the employee, covered family of the employee (including a servicemember being cared for by an employee) and the employee is unable to return to work, certification issued by the health care provider of the entity with the serious health condition shall be required to support the inability of the employee to return to work.~~

~~***Intermittent or reduced time (IRT) leave.*** FMLA leave may be taken intermittently or on a reduced leave schedule under the following circumstances:~~

~~A. If medically necessary to care for a family member or for the employee's own serious health condition;~~

~~B. Because of any qualifying exigency the spouse, or a son, daughter, or parent, of the employee is on active duty, or notified of an impending call or order to active duty in support of a contingency operation; or~~

~~C. If approved by the District.~~

~~The District may, for the term of the leave, transfer the employee to an alternative position with equivalent pay and benefits.~~

~~If the IRT leave is for an *instructional employee* (one whose principal function is to instruct students in a class, small group, or as individuals), the District can require the employee either to take leave for a period or periods of a particular duration not greater than the duration of the planned treatment or to transfer temporarily to an available alternative position with equivalent pay and benefits that provides better accommodation of recurring periods of leave, provided the leave is:~~

~~A. Requested to care for a qualifying family member or as a result of the employee's serious health condition preventing job performance;~~

~~B. Foreseeable, based upon planned medical treatment; and~~

~~C. For more than twenty percent (20%) of the working days in the leave period.~~

~~The employee may be granted leave under these circumstances, subject to reasonable efforts to schedule treatment so as not to unduly disrupt the educational program.~~

~~***Special end-of-semester circumstances for instructional employees.*** Under each of the following conditions, leave for an instructional employee may be required to continue to the end of the academic semester:~~

~~A. Leave begins more than five (5) weeks before the end of the semester, leave is for at least three (3) weeks, and return to employment would occur during the last three (3) weeks of the semester.~~

~~B. Leave other than for the employee's serious health condition begins within the last five (5) weeks of the semester, leave is for greater than two (2) weeks duration, and return to employment would occur during the last two (2) weeks of the semester.~~

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~~C. Leave other than for the employee's serious health condition begins within the last three (3) weeks of the semester and leave exceeds five (5) working days.~~

~~***Employee notification.*** With each request for FMLA leave, the employee shall be notified:~~

~~A. About FMLA by provision of the FMLA fact sheet (Exhibit EE).~~

~~B. As appropriate concerning the expectations, obligations, and consequences of taking FMLA leave per 29 C.F.R. 825.300(a) of FMLA.~~

~~C. That FMLA leave may be withheld until a requested notice is provided or the time frame is met.~~

~~D. That if leave is granted to an employee who is unable to perform the work required, restoration may be denied until the employee has complied with the request to provide medical certification of ability to return to work.~~

~~The District will post notices in conspicuous places on the District premises that provide a summary of FMLA and information on how to file a charge for an FMLA violation.~~

~~***Health care continuation.*** An employee taking FMLA leave shall be entitled to have the health care plan in which the employee is participating continue under the same terms and conditions applicable to actively working employees. The District shall require the repayment of any health care premiums paid by the District for continuing coverage during the period of the FMLA leave if the employee fails to return to work after the FMLA leave expires and the failure to return is not due to circumstances beyond the employee's control.~~

~~***Position restoration.*** Upon return from FMLA leave, an employee shall be restored to the same position held before the FMLA leave commenced or to an equivalent position with equivalent pay, benefits, and working conditions. The District requires an employee to provide a medical certificate from a health care provider that the employee is able to resume work before returning from FMLA leave for a serious personal health condition. The District may delay the return of an instructional employee from FMLA leave at the end of a semester, in accordance with Section 825.602 of FMLA rules. The District may deny restoration of position to any key employee (i.e., one who is among the highest paid ten percent [10%] of all employees of the District), in accordance with Section 825.218 of FMLA rules.~~

~~Adopted: _____~~

~~LEGAL REF.:~~
~~A.R.S.~~
~~15-510~~
~~Family and Medical Leave Act of 1993~~
~~29 C.F.R. Part 825~~

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~~EXHIBIT~~

~~PROFESSIONAL / SUPPORT STAFF~~
~~LEAVES OF ABSENCE WITHOUT PAY~~

~~CERTIFICATION OF HEALTH CARE PROVIDER~~
~~(Family and Medical Leave Act of 1993)~~
~~When completed, this form goes to the employee.~~

~~1. Employee's Name _____~~

~~2. Patient's Name (If different from employee) _____~~

~~3. A definition of **"serious health condition"** under the Family and Medical Leave Act is provided near the end of this form. Does the patient's condition[1] qualify under any of the categories described? If so, please check the applicable category.~~

~~(1) ___ (2) ___ (3) ___ (4) ___ (5) ___ (6) ___, or None of the above ___~~

~~4. Describe the **medical facts** which support the patient's certification, including a brief statement as to how the medical facts meet the criteria of the category checked above:~~

~~5. a. State the approximate **date** the condition commenced, and the probable duration of the condition (and also the probable duration of the patient's present ***incapacity***[2] if different):~~

~~b. Will it be necessary for the employee to take work only **intermittently or to work on a less than full schedule** as a result of the condition (including for treatment described in Item 6 below)?~~

~~If yes, give the probable duration:~~

~~c. If the condition is a **chronic condition** (condition 4) or **pregnancy**, state whether the patient is presently incapacitated[2] and the likely duration and frequency of **episodes of incapacity**[2]:~~

~~[1] Here and elsewhere on this form, the information sought relates only to the condition for which the employee is taking FMLA leave.~~

~~[2] "Incapacity," for purposes of FMLA, is defined to mean inability to work, attend school or perform other regular daily activities due to the serious health condition, treatment therefore, or recovery therefrom.~~

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6. a. If additional **treatments** will be required for the condition, provide an estimate of the probable number of such treatments.

If the patient will be absent from work or other daily activities because of **treatment** on an **intermittent** or **part-time** basis, also provide an estimate of the probable number of and interval between such treatments, actual or estimated dates of treatment if known, and period required for recovery if any:

B If any of these treatments will be provided by **another provider of health services** (e.g., physical therapist), please state the nature of the treatments:

C **If a regimen of continuing treatment** by the patient is required under your supervision, provide a general description of such regimen (e.g., prescription drugs, physical therapy requiring special equipment):

---

7. a. If medical leave is required for the employee's **absence from work** because of the **employee's own condition** (including absences due to pregnancy or a chronic condition), is the employee **unable to perform work** of any kind?

b. If able to perform some work, is the employee **unable to perform any one (1) or one (1) or more of the essential functions of the employee's job** (the employee or the employer should supply you with information about the essential job functions)? If yes, please list the essential functions the employee is unable to perform:

c. If neither a. nor b. above applies, is it necessary for the employee to be **absent from work for treatment**?

---

8. a. If leave is required to **care for a family member** of the employee with a serious health condition, **does the patient require assistance** for basic medical or personal needs or safety, or for transportation?

b. If no, would the employee's presence to provide **psychological comfort** be beneficial to the patient or assist in the patient's recovery?

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c. If the patient will need care only **intermittently** or on a part-time basis, please indicate the probable **duration** of this need:

_____

_____ _____

Signature of Health Care Provider Type of Practice

_____ _____

Address Telephone Number

_____ _____

Date

To be completed by the employee needing family leave to care for a family member:

State the care you will provide and an estimate of the period during which care will be provided, including a schedule if leave is to be taken intermittently or if it will be necessary for you to work less than a full schedule:

_____ _____

Employee Signature Date

Definitions

A **"Serious Health Condition"** means an illness, injury impairment, or physical or mental condition that involves one (1) of the following:

1. Hospital Care

Inpatient care (i.e., an overnight stay) in a hospital, hospice, or residential medical care facility, including any period of incapacity[2] or subsequent treatment in connection with or consequent to such inpatient care.

2. Absence Plus Treatment

(a) A period of incapacity[2] of **more than three (3) consecutive calendar days** (including any subsequent treatment or period of incapacity[2] relating to the same condition), that also involves:

(1) **Treatment**[3] **two (2) or more times** by a health care provider, by a nurse or physician's assistant under direct supervision of a health care provider, or by a provider of health care services (e.g., physical therapist) under orders of, or on referral by, a health care provider; or

(2) **Treatment** by a health care provider on **at least one (1) occasion** which results in a **regimen of continuing treatment**[4] under the supervision of the health care provider.

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~~3. Pregnancy~~

~~Any period of incapacity due to **pregnancy**, or for **prenatal care**.~~

~~4. Chronic Conditions Requiring Treatments~~

~~**A chronic condition** which:~~

~~(1) Requires **periodic visits** for treatment by a health care provider, or by a nurse or physician's assistant under direct supervision of a health care provider;~~

~~(2) Continues over an **extended period of time** (including recurring episodes of a single underlying condition); and~~

~~(3) May cause **episodic** rather than a continuing period of incapacity[2] (e.g., asthma, diabetes, epilepsy, etc.).~~

~~5. Permanent/Long-term Conditions Requiring Supervision~~

~~A period of **Incapacity**[2] which is **permanent or long-term** due to a condition for which treatment may not be effective. The employee or family member must be **under the continuing supervision of, but need not be receiving active treatment by, a health care provider**. Examples include Alzheimer's, a severe stroke, or the terminal stages of a disease.~~

~~6. Multiple Treatments (Non-Chronic Conditions)~~

~~Any period of absence to receive multiple treatments (including any period of recovery therefrom) by a health care provider or by a provider of health care services under orders of, or on referral by, a health care provider, either for restorative surgery after an accident or other injury, or for a condition that would likely result in a period of Incapacity2 of more than three (3) consecutive calendar days in the absence of medical intervention or treatment, such as cancer (chemotherapy, radiation, etc.), severe arthritis (physical therapy), and kidney disease (dialysis).~~

~~This optional form may be used by employees to satisfy a mandatory requirement to furnish a medical certification (when requested) from a health care provider, including second or third opinions and recertification (29 C.F.R. 825.306).~~

~~[3] Treatment includes examinations to determine if a serious health condition exists and evaluations of the condition. Treatment does not include routine physical examinations, eye examinations, or dental examinations.~~

~~[4] A regimen of continuing treatment includes, for example, a course of prescription medication (e.g., an antibiotic) or therapy requiring special equipment to resolve or alleviate the health condition. A regimen of treatment does not include the taking of over-the-counter medications such as aspirin, antihistamines, or salves; or bed-rest, drinking fluids, exercise, and other similar activities that can be initiated without a visit to a health care provider.~~

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~~EXHIBIT~~

~~PROFESSIONAL / SUPPORT STAFF~~
~~LEAVES OF ABSENCE WITHOUT PAY~~

~~EMPLOYER RESPONSE TO EMPLOYEE REQUEST~~
~~FOR FAMILY OR MEDICAL LEAVE~~
~~(Family and Medical Leave Act of 1993~~
~~Optional Use Form - See 29 C.F.R. § 825.300)~~

~~Date: _____~~

~~To: _____~~
~~_____ (Employee's Name)~~

~~From: _____~~
~~_____ (Name of Appropriate Employer Representative)~~

~~Subject: **REQUEST FOR FAMILY/MEDICAL LEAVE**~~

~~On _____, you notified us of your need to take family/~~
~~_____ (Date)~~
~~medical leave due to:~~

~~[ ] The birth of a child, or the placement of a child with you for adoption or foster care; or~~

~~[ ] A serious health condition that makes you unable to perform the essential functions for your job; or~~

~~[ ] A serious health condition affecting your [ ] spouse, [ ] child, [ ] parent, for which you are needed to provide care; or~~

~~[ ] A qualifying exigency (as the Secretary shall, by regulation, determine) arising out of the fact that the spouse, or a son, daughter, or parent of the employee is on active duty (or has been notified of an impending call or order to active duty) in the Armed Forces in support of a contingency operation.~~

~~You notified us that you need this leave beginning on _____.~~
~~_____ (Date)~~

~~and that you expect leave to continue until on or about _____.~~
~~_____ (Date)~~

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~~Except as explained below, you have a right under the FMLA for up to twelve (12) weeks of unpaid leave in a twelve (12) month period for the reasons listed above. Also, your health benefits must be maintained during any period of unpaid leave under the same conditions as if you continued to work, and you must be reinstated to the same or an equivalent job with the same pay, benefits, and terms and conditions of employment on your return from leave. If you do not return to work following FMLA leave for a reason other than: 1) the continuation, recurrence, or onset of a serious health condition which would entitle you to FMLA leave; or 2) other circumstances beyond your control, you may be required to reimburse us for our share of health insurance premiums paid on your behalf during your FMLA leave.~~

~~This is to inform you that: (*check appropriate boxes: explain where indicated*)~~

1. ~~You are [ ] eligible [ ] not eligible for leave under the FMLA.~~

2. ~~The requested leave [ ] will [ ] will not be counted against your annual FMLA leave entitlement.~~

3. ~~You [ ] will [ ] will not be required to furnish medical certification of a serious health condition. If required, you must furnish certification by _____ (insert date; must be at least fifteen [15] days after you are notified of this requirement), or we may delay the commencement of your leave until the certification is submitted.~~

4. ~~You may elect to substitute accrued paid leave for unpaid FMLA leave. We [ ] will [ ] will not require that you substitute accrued paid leave for unpaid FMLA leave. If paid leave will be used, the following conditions will apply: (Explain)~~

5. ~~(a) If you normally pay a portion of the premiums for your health insurance, these payments will continue during the period of FMLA leave. Arrangements for payment have been discussed with you, and it is agreed that you will make premium payments as follows: (Set forth dates, e.g., the tenth [10th] of each month, or pay periods, etc., that specifically cover the agreement with the employee.)~~

   ~~(b) You have a minimum thirty (30) day (or, indicate longer period, if applicable) grace period in which to make premium payments. If payment is not made timely, your group health insurance may be cancelled, provided we notify you in writing at least fifteen (15) days before the date that your health coverage will lapse, or, at our option, we may pay your share of the premiums during FMLA leave, and recover these payments from you upon your return to work. We [ ] will [ ] will not pay your share of health insurance premiums while you are on leave.~~

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~~(c) We o will o will not do the same with other benefits (e.g., life insurance, life insurance, disability insurance, etc.) while you are on FMLA leave. If we do pay your premiums for other benefits, when you return from leave you [ ] will [ ] will not be expected to reimburse us for the payments made on your behalf.~~

~~6. You [ ] will [ ] will not be required to present a fitness-for-duty certificate prior to being restored to employment. If such certification is required but not received, your return to work may be delayed until certification is provided.~~

~~7. (a) You [ ] are [ ] are not a "key employee" as described in § 825.217 of the FMLA regulations. If you are a "key employee:" restoration to employment may be denied following FMLA leave on the grounds that such restoration will cause substantial and grievous economic injury to the District as discussed in § 825.218.~~

~~(b) We [ ] have [ ] have not determined that restoring you to employment at the conclusion of FMLA leave will cause substantial and grievous economic harm to us §825.219 of the FMLA regulations.)~~

~~8. While on leave, you [ ] will [ ] will not be required to furnish us with periodic reports every _____ (indicate interval of periodic reports, as appropriate for the particular leave situation) of your status and intent to return to work (see § 825.309 of the FMLA regulations). If the circumstances of your leave change and you are able to return to work earlier than the date indicated on the reverse side of this form, you [ ] will [ ] will not be required to notify us at least two (2) work days prior to the date you intend to report to work.~~

~~9. You [ ] will [ ] will not be required to furnish recertification relating to a serious health condition. (Explain below, if necessary, including the interval between certifications as prescribed in §825.308 of the FMLA regulations.)~~

~~This optional use form may be used to satisfy mandatory employer requirements to provide employees taking FMLA leave with written notice detailing specific expectations and obligations of the employee and explaining any consequences of a failure to meet these obligations. (29 C.F.R. 825.300(b).)~~

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~~EXHIBIT~~

~~PROFESSIONAL / SUPPORT STAFF LEAVES OF ABSENCE WITHOUT PAY~~

~~YOUR RIGHTS UNDER THE FAMILY AND MEDICAL LEAVE ACT OF 1993~~

~~The Family and Medical Leave Act of 1993 (FMLA) requires covered employers to provide up to twelve (12) weeks of unpaid, job-protected leave to "eligible" employees for certain family and medical reasons. Employees are eligible if they have worked for their employer for at least one (1) year, and for one thousand two hundred fifty (1,250) hours over the previous twelve (12) months, and if there are at least fifty (50) employees within seventy-five (75) miles. The FMLA permits employees to take leave on an intermittent basis or to work a reduced schedule under certain circumstances.~~

~~Reasons for Taking Leave~~

~~Unpaid leave must be granted for any of the following reasons:~~

> ~~A. To care for the employee's child after birth, or placement for adoption or foster care;~~
>
> ~~B. To care for the employee's spouse, son or daughter, or parent who has a serious health condition; or~~
>
> ~~C. For a serious health condition that makes the employee unable to perform the employee's job.~~

~~At the employee's or employer's option, certain kinds of paid leave may be substituted for unpaid leave.~~

~~Advance Notice and Medical Certification~~

~~The employee may be required to provide advance leave notice and medical certification. Taking of leave may be denied if requirements are not met.~~

> ~~A. The employee ordinarily must provide thirty (30) days advance notice when the leave is "foreseeable."~~
>
> ~~B. An employer may require medical certification to support a request for leave because of a serious health condition, and may require second or third opinions (at the employer's expense) and a fitness for duty report to return to work.~~

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~~Job Benefits and Protection:~~

~~A. For the duration of FMLA leave, the employer must maintain the employee's health coverage under any "group health plan."~~

~~B. Upon return from FMLA leave, most employees must be restored to their original or equivalent positions with equivalent pay, benefits, and other employment terms.~~

~~C. The use of FMLA leave cannot result in the loss of any employment benefit that accrued prior to the start of an employee's leave.~~

~~Unlawful Acts by Employers~~

~~FMLA makes it unlawful for any employer to:~~

~~A. interfere with, restrain, or deny the exercise of any right provided under FMLA.~~

~~B. discharge or discriminate against any person for opposing any practice made unlawful by FMLA or for involvement in any proceeding under or relating to FMLA.~~

~~Enforcement:~~

~~A. The U.S. Department of Labor is authorized to investigate and resolve complaints of violations.~~

~~B. An eligible employee may bring a civil action against an employer for violations.~~

~~FMLA does not affect any federal or state law prohibiting discrimination, or supersede any state or local law or collective bargaining agreement which provides greater family or medical leave rights.~~

~~For Additional Information~~

~~If you have access to the Internet visit the FMLA website: http://www.dol.gov/esa/whd/fmla. To locate your nearest Wage-Hour Office, telephone the Wage-Hour toll-free information and help line at 1-866-4USWAGE (1-866-487-9243); a customer service representative is available to assist you with referral information from 8am to 5pm in your time zone; or log onto the following at http://www.wagehour.dol.gov.~~

~~A Spanish translation of this form may be downloaded at http://www.dol.gov/whd/fmla/index.htm~~

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~~EXHIBIT~~

~~PROFESSIONAL / SUPPORT STAFF LEAVES OF ABSENCE WITHOUT PAY~~

~~MILITARY FAMILY LEAVE~~

~~*The National Defense Authorization Act for FY 2008 (NDAA), Public Law 110-181, Section 585(a), amended the Family and Medical Leave Act of 1993 (FMLA) to provide eligible employees working for covered employers two (2) important new leave rights related to military service*:~~

~~**(1) New Qualifying Reason for Leave.** Eligible employees are entitled to up to twelve (12) weeks of leave because of "any qualifying exigency" arising out of the fact that the spouse, son, daughter, or parent of the employee is on active duty, or has been notified of an impending call to active duty status, in support of a contingency operation. By the terms of the statute, this provision requires the Secretary of Labor to issue regulations defining "any qualifying exigency." In the interim, employers are encouraged to provide this type of leave to qualifying employees.~~

~~**(2) New Leave Entitlement.** An eligible employee who is the spouse, son, daughter, parent, or next of kin of a covered servicemember who is recovering from a serious illness or injury sustained in the line of duty on active duty is entitled to up to twenty-six (26) weeks of leave in a single twelve (12) month period to care for the servicemember. This provision became effective immediately upon enactment. This military caregiver leave is available during "a single twelve (12) month period" during which an eligible employee is entitled to a combined total of twenty-six (26) weeks of all types of FMLA leave.~~

~~Additional information on the amendments and a version of Title I of the FMLA with the new statutory language incorporated are available on the FMLA amendments Web site at http://www.dol.gov/agencies/whd/fmla/law.~~

~~A Spanish translation of this form may be downloaded at http://www.dol.gov/whd/fmla/index.htm~~

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~~EXHIBIT~~

~~PROFESSIONAL / SUPPORT STAFF LEAVES OF ABSENCE WITHOUT PAY~~

~~FACT SHEET NO. 28: THE FAMILY AND MEDICAL LEAVE ACT OF 1993~~

~~The U.S. Department of Labor's Employment Standards Administration, Wage and Hour Division, administers and enforces the Family and Medical Leave Act (FMLA) for all private, state and local government employees, and some federal employees. Most federal and certain congressional employees are also covered by the law and are subject to the jurisdiction of the U.S. Office of Personnel Management or the Congress.~~

~~The FMLA became effective on August 5, 1993 for most employers and entitles eligible employees to take up to twelve (12) weeks of unpaid, job-protected leave in a twelve (12) month period for specified family and medical reasons. Amendments to the FMLA by the National Defense Authorization Act for FY 2008 (NDAA). Public Law 110-181, expanded the FMLA to allow eligible employees to take up to twelve (12) weeks of job-protected leave in the applicable twelve (12) month period for any "qualifying exigency" arising out of the fact that a covered military member is on active duty, or has been notified of an impending call or order to active duty, in support of a contingency operation. The NDAA also amended the FMLA to allow eligible employees to take up to twenty-six (26) weeks of job-protected leave in a "single twelve (12) month period" to care for a covered servicemember with a serious injury or illness.~~

~~Employer Coverage~~

~~FMLA applies to all public agencies, including state, local and federal employers, local education agencies (schools), and private-sector employers who employed fifty (50) or more employees in twenty (20) or more workweeks in the current or preceding calendar year, including joint employers and successors of covered employers.~~

~~Employee Eligibility~~

~~To be eligible for FMLA benefits, an employee must:~~

~~A. work for a covered employer;~~

~~B. have worked for the employer for a total of twelve (12) months;~~

~~C. have worked at least one thousand two hundred fifty (1,250) hours over the previous twelve (12) months; and~~

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~~D. work at a location in the United States or in any territory or possession of the United States where at least fifty (50) employees are employed by the employer within seventy-five (75) miles.~~

~~While the twelve (12) months of employment need not be consecutive, employment periods prior to a break in service of seven (7) years or more need not be counted unless the break is occasioned by the employee's fulfillment of his or her National Guard or Reserve military obligation (as protected under the Uniformed Services Employment and Reemployment Rights Act (USERRA), or a written agreement, including a collective bargaining agreement, exists concerning the employer's intention to rehire the employee after the break in service. See, special rules for returning reservists under USERRA.~~

~~Leave Entitlement~~

~~A covered employer must grant an eligible employee up to a total of twelve (12) workweeks of unpaid leave during any twelve (12)-month period for one (1) or more of the following reasons:~~

~~A. For the birth and care of a newborn child of the employee;~~

~~B. For placement with the employee of a son or daughter for adoption or foster care;~~

~~C. To care for a spouse, son, daughter, or parent with a serious health condition;~~

~~D. To take medical leave when the employee is unable to work because of a serious health condition; or~~

~~E. For qualifying exigencies arising out of the fact that the employee's spouse, son, daughter, or parent is on active duty or call to active duty status as a member of the National Guard or Reserves in support of a contingency operation.~~

~~A covered employer also must grant an eligible employee who is a spouse, son, daughter, parent, or next of kin of a current member of the Armed Forces, including a member of the National Guard or Reserves, with a serious injury or illness up to a total of twenty-six (26) workweeks of unpaid leave during a "single twelve (12)-month period" to care for the servicemember.~~

~~Spouses employed by the same employer are limited in the amount of family leave they may take for the birth and care of a newborn child, placement of a child for adoption or foster care, or to care for a parent who has a serious health condition to a combined total of twelve (12) weeks (or twenty-six [26] weeks if leave to care for a covered servicemember with a serious injury or illness is also used). Leave for birth and care, or placement for adoption or foster care, must conclude within twelve (12) months of the birth or placement.~~

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~~Under some circumstances, employees may take FMLA leave intermittently - taking leave in separate blocks of time for a single qualifying reason - or on a reduced leave schedule - reducing the employee's usual weekly or daily work schedule. When leave is needed for planned medical treatment, the employee must make a reasonable effort to schedule treatment so as not to unduly disrupt the employer's operation. If FMLA leave is for birth and care, or placement for adoption or foster care, use of intermittent leave is subject to the employer's approval.~~

~~Under certain conditions, employees or employers may choose to "substitute" (run concurrently) accrued paid leave (such as sick or vacation leave) to cover some or all of the FMLA leave. An employee's ability to substitute accrued paid leave is determined by the terms and conditions of the employer's normal leave policy.~~

~~"*Serious health condition*" means an illness, injury, impairment, or physical or mental condition that involves either:~~

~~A. Inpatient care (i.e., an overnight stay) in a hospital, hospice, or residential medical care facility, including any period of incapacity (i.e., inability to work, attend school, or perform other regular daily activities) or subsequent treatment in connection with such inpatient care; or~~

~~B. Continuing treatment by a health care provider, which includes:~~

~~1. A period of incapacity lasting more than three (3) consecutive, full calendar days, and any subsequent treatment or period of incapacity relating to the same condition, that also includes:~~

~~a. treatment two (2) or more times by or under the supervision of a health care provider (i.e., in-person visits, the first within seven [7] days and both within thirty [30] days of the first day of incapacity); or~~

~~b. one (1) treatment by a health care provider (i.e., an in-person visit within seven [7] days of the first day of incapacity) with a continuing regimen of treatment (e.g., prescription medication, physical therapy); or~~

~~2. Any period of incapacity related to pregnancy or for prenatal care. A visit to the health care provider is not necessary for each absence; or~~

~~3. Any period of incapacity or treatment for a chronic serious health condition which continues over an extended period of time, requires periodic visits (at least twice a year) to a health care provider, and may involve occasional episodes of incapacity. A visit to a health care provider is not necessary for each absence; or~~

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~~4. A period of incapacity that is permanent or long-term due to a condition for which treatment may not be effective. Only supervision by a health care provider is required, rather than active treatment; or~~

~~5. Any absences to receive multiple treatments for restorative surgery or for a condition that would likely result in a period of incapacity of more than three (3) days if not treated.~~

~~Maintenance of Health Benefits~~

~~A covered employer is required to maintain group health insurance coverage for an employee on FMLA leave whenever such insurance was provided before the leave was taken and on the same terms as if the employee had continued to work. If applicable, arrangements will need to be made for employees to pay their share of health insurance premiums while on leave. In some instances, the employer may recover premiums it paid to maintain health coverage for an employee who fails to return to work from FMLA leave.~~

~~Job Restoration~~

~~Upon return from FMLA leave, an employee must be restored to the employee's original job, or to an equivalent job with equivalent pay, benefits, and other terms and conditions of employment. An employee's use of FMLA leave cannot result in the loss of any employment benefit that the employee earned or was entitled to before using FMLA leave, nor be counted against the employee under a "no fault" attendance policy. If a bonus or other payment, however, is based on the achievement of a specified goal such as hours worked, products sold, or perfect attendance, and the employee has not met the goal due to FMLA leave, payment may be denied unless it is paid to an employee on equivalent leave status for a reason that does not qualify as FMLA leave.~~

~~An employee has no greater right to restoration or to other benefits and conditions of employment than if the employee had been continuously employed.~~

~~Notice and Certification~~

~~Employee Notice~~

~~Employees seeking to use FMLA leave are required to provide thirty (30)-day advance notice of the need to take FMLA leave when the need is foreseeable and such notice is practicable. If leave is foreseeable less than thirty (30) days in advance, the employee must provide notice as soon as practicable - generally, either the same or next business day. When the need for leave is not foreseeable, the employee must provide notice to the employer as soon as practicable under the facts and circumstances of the particular case. Absent unusual circumstances, employees must comply with the employer's usual and customary notice and procedural requirements for requesting leave.~~

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~~Employees must provide sufficient information for an employer reasonably to determine whether the FMLA may apply to the leave request. Depending on the situation, such information may include that the employee is incapacitated due to pregnancy, has been hospitalized overnight, is unable to perform the functions of the job, and/or that the employee or employee's qualifying family member is under the continuing care of a health care provider.~~

~~When an employee seeks leave for a FMLA-qualifying reason for the first time, the employee need not expressly assert FMLA rights or even mention the FMLA. When an employee seeks leave, however, due to a FMLA-qualifying reason for which the employer has previously provided the employee FMLA-protected leave, the employee must specifically reference either the qualifying reason for leave or the need for FMLA leave.~~

~~Employer Notice~~

~~Covered employers must post a notice approved by the Secretary of Labor explaining rights and responsibilities under FMLA. An employer that willfully violates this posting requirement may be subject to a fine of up to one hundred ten dollars ($110) for each separate offense. Additionally, employers must either include this general notice in employee handbooks or other written guidance to employees concerning benefits, or must distribute a copy of the notice to each new employee upon hiring.~~

~~When an employee requests FMLA leave or the employer acquires knowledge that leave may be for a FMLA purpose, the employer must notify the employee of his or her eligibility to take leave, and inform the employee of his/her rights and responsibilities under FMLA. When the employer has enough information to determine that leave is being taken for a FMLA-qualifying reason, the employer must notify the employee that the leave is designated and will be counted as FMLA leave.~~

~~Certification~~

~~Employers may require that an employee's request for leave due to a serious health condition affecting the employee or a covered family member be supported by a certification from a health care provider. An employer may require second or third medical opinions (at the employer's expense) and periodic recertification of a serious health condition. An employer may use a health care provider, a human resource professional, a leave administrator, or a management official - but not the employee's direct supervisor - to authenticate or clarify a medical certification of a serious health condition. An employer may have a uniformly-applied policy requiring employees returning from leave for their own serious health condition to submit a certification that they are able to resume work. If reasonable safety concerns exist, an employer may, under certain circumstances, require such a certification for employees returning from intermittent FMLA leave.~~

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~~Unlawful Acts~~

~~It is unlawful for any employer to interfere with, restrain, or deny the exercise of any right provided by FMLA. It is also unlawful for an employer to discharge or discriminate against any individual for opposing any practice, or because of involvement in any proceeding, related to FMLA.~~

~~Enforcement~~

~~The Wage and Hour Division investigates complaints. If violations cannot be satisfactorily resolved, the U.S. Department of Labor may bring action in court to compel compliance. Individuals may also be able to bring a private civil action against an employer for violations.~~

~~Other Provisions~~

~~Special rules apply to employees of local education agencies. Generally, these rules apply to intermittent leave or when leave is required near the end of a school term.~~

~~Salaried executive, administrative, and professional employees of covered employers who meet the Fair Labor Standards Act (FLSA) criteria for exemption from minimum wage and overtime under Regulations, 29 C.F.R. Part 541, do not lose their FLSA-exempt status by using any unpaid FMLA leave. This special exception to the "salary basis" requirements for FLSA's exemption extends only to an "eligible" employee's use of leave required by FMLA.~~

~~For additional information, visit the Wage and Hour Division Website: http://www.wagehour.dol.gov and/or call the toll-free information and helpline, available 8 a.m. to 5 p.m. in your time zone, 1-866-4USWAGE (1-866-487-9243).~~

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~~LEAVES OF ABSENCE WITHOUT PAY~~

~~[FMLA POLICY WHEN FEWER THAN 50 EMPLOYEES]~~

~~The District recognizes that on occasion extenuating circumstances arise that may necessitate absence from duty that is not covered by other specific leave provisions of the District. To address such situations, a leave of absence, without pay, may be granted a member of the certificated or support staff for not longer than one (1) year.~~

~~Leave of absence may be requested for, but not limited to, the following purposes:~~

> ~~A. For additional education that relates to the employee's primary assignment. A plan of contemplated course work must be presented.~~
>
> ~~B. To provide for an unpaid leave in a situation where the employee will be absent from work because of 1) a reason that conforms to a policy currently in effect but the maximum number of days provided for in that policy will be exceeded, or 2) failure to report to work without prior notification to the Superintendent.~~
>
> ~~C. For a leave of absence that benefits or is in the best interest of the District, as determined by the Board upon review of the application.~~

~~A leave of absence requested pursuant to this policy may be:~~

> ~~A. Approved by the Superintendent if the leave period does not exceed twelve (12) weeks; or~~
>
> ~~B. Recommended by the Superintendent and approved by the Governing Board if the leave period exceeds twelve (12) weeks.~~

~~All applications for leave of absence may be granted or denied by the District, in its sole discretion.~~

~~Each request for such a leave of absence shall be in a written application stating the purpose, starting date, and duration of the leave of absence, the reasons for its necessity or desirability, and any other information the applicant deems relevant to the request.~~

~~The leave of absence shall be only for the purpose and duration approved and may not be extended without written approval by the District.~~

~~All rights of continuing status (certificated teachers only), retirement, salary increments, and other benefits shall be restored at the level earned when the leave was granted. All accrued sick, vacation, personal, and other paid leave shall be applied to the leave period unless otherwise agreed to by the District.~~

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~~**Family and Medical Leave Act (FMLA)**~~

~~As the District has fewer than fifty (50) employees within a seventy-five (75) mile radius, District personnel are not eligible for provisions of the Family and Medical Leave Act (FMLA).~~

~~Adopted: _____~~

~~LEGAL REF.:~~
~~A.R.S.~~
~~15-510~~
~~29 C.F.R. Part 825~~
~~Family and Medical Leave Act of 1993~~

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~~MILITARY / LEGAL LEAVE~~

~~The Board recognizes the fact that its employees have citizenship responsibilities, and, in order to make it possible for said employees to carry out their responsibilities to the city, county, state, or nation, the Board will grant leaves, in addition to jury duty, when an employee is called to attend field training services for the Military Reserve or National Guard and when an employee is a victim of a juvenile or adult crime exercising a right to be present at a proceeding as defined in statute.~~

~~When an employee receives notice that requires leave as delineated above, it is the responsibility of the employee to notify the Superintendent or principal.~~

~~Jury Duty~~

~~It is recognized by the Board that no employee is exempt from jury duty and that leaves of absence for such duty must be granted.~~

~~Only the regular salary may be received by an employee on jury duty.~~

~~1. It is the responsibility of the employee to reimburse the District for jury duty pay when such payment is made directly to the employee. Failure to reimburse the District at the completion of the jury duty service will result in a full deduction equal to the number of contract days missed.~~

~~2. An employee excused from jury duty after being summoned shall report for regular duty as soon as possible. Failure to report for duty will result in a deduction equal to that portion of a contract day missed [A.R.S. 21-236].~~

~~Victim Leave~~

~~Statute provides that an employer who has fifty (50) or more employees shall permit an employee leave if the employee is the victim of juvenile or adult crime and is exercising a right to be present at a proceeding as defined in A.R.S. 8-420 or 13-4439. Compensation may be provided if the employee has available vacation or to the extent other leave may be available by policy.~~

~~A. An employee's accrued vacation, personal, sick or other applicable leave shall be used to the extent available by policy.~~

~~B. If paid leave is unavailable, the employee must request an unpaid leave of absence in accord with policy.~~

~~C. Before an employee may leave work for this purpose, the employee shall provide the employer with a copy of the form provided by law enforcement and if applicable a copy of the information the law enforcement agency provides the employee pursuant to either A.R.S. 8-386 or 13-4405.~~

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~~D. Leave for this purpose may be limited if the leave creates an undue hardship to the employer's business.~~

~~Military Leave:~~

~~A. An employee who is a member of the Military Reserve or National Guard shall be entitled to leave of absence without loss of pay, time, or efficiency rating when engaged in field training [A.R.S. 26-168 and 38-610].~~

~~B. An employee who is a member of the uniformed service may use any vacation leave or other accumulated paid time off during their service, or may take unpaid leave of absence.~~

~~C. The District must reemploy uniformed service members, as defined in 38 U.S.C. 4303, returning from a period of service, if the service member:~~

~~1. Was employed by the District.~~

~~2. Gave the District notice that he or she was leaving the job for service in the uniformed services, unless giving notice was precluded by military necessity or otherwise impossible or unreasonable.~~

~~3. Has a cumulative period of service in the uniformed services not exceeding five (5) years.~~

~~4. Was not released from service under dishonorable or other punitive conditions.~~

~~5. Has reported back to the District in a timely manner or has submitted a timely application for reemployment in accordance with the Uniformed Services Employment and Reemployment Rights Act.~~

~~Adopted: _____~~

~~LEGAL REF.:~~
~~A.R.S.~~
~~8-386~~
~~8-420~~
~~13-4405~~
~~15-502~~
~~16-402~~
~~21-236~~
~~26-168~~
~~38-610~~
~~A.G.O.~~
~~I80-177~~
~~38 U.S.C. 4301 *et seq.*, Uniformed Services Employment and Reemployment Rights Act~~

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~~EXHIBIT~~

~~PROFESSIONAL / SUPPORT STAFF MILITARY / LEGAL LEAVE~~

~~Part 200 - Regulations Under the Uniformed Services Employment and Reemployment Rights Act of 1994 (Appendix to Part 1002 - Your Rights Under USERRA)~~

~~The Uniformed Services Employment and Reemployment Rights Act~~

~~USERRA protects the job rights of individuals who voluntarily or involuntarily leave employment positions to undertake military service or certain types of service in the National Disaster Medical System. USERRA also prohibits employers from discriminating against past and present members of the uniformed services, and applicants to the uniformed services.~~

~~Reemployment Rights~~

~~You have the right to be reemployed in your civilian job if you leave that job to perform service in the uniformed service and;~~

~~A. you ensure that your employer receives advance written or verbal notice of your service;~~

~~B. you have five years or less of cumulative service in the uniformed services while with that particular employer;~~

~~C. you return to work or apply for reemployment in a timely manner after conclusion of service; and~~

~~D. you have not been separated from service with a disqualifying discharge or under other than honorable conditions.~~

~~If you are eligible to be reemployed, you must be restored to the job and benefits you would have attained if you had not been absent due to military service or, in some cases, a comparable job.~~

~~Right to be Free from Discrimination and Retaliation~~

~~If you:~~

~~A. are a past or present member of the uniformed service;~~

~~B. have applied for membership in the uniformed service; or~~

~~C. are obligated to serve in the uniformed service;~~

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~~then an employer may not deny you:~~

~~A. initial employment;~~

~~B. reemployment;~~

~~C. retention in employment;~~

~~D. promotion; or~~

~~E. any benefit of employment;~~

~~because of this status.~~

~~In addition, an employer may not retaliate against anyone assisting in the enforcement of USERRA rights, including testifying or making a statement in connection with a proceeding under USERRA, even if that person has no service connection.~~

~~Health Insurance Protection:~~

~~A. If you leave your job to perform military service, you have the right to elect to continue your existing employer-based health plan coverage for you and your dependents for up to twenty-four (24) months while in the military.~~

~~B. Even if you don't elect to continue coverage during your military service, you have the right to be reinstated in your employer's health plan when you are reemployed, generally without any waiting periods or exclusions (e.g., pre-existing condition exclusions) except for service-connected illnesses or injuries.~~

~~Enforcement:~~

~~A. The U.S. Department of Labor, Veterans Employment and Training Service (VETS) is authorized to investigate and resolve complaints of USERRA violations.~~

~~B. For assistance in filing a complaint, or for any other information on USERRA, contact VETS at **1-866-4-USA-DOL** or visit its website at **http://www.dol.gov/agencies/vets/programs/userra**. An interactive online USERRA Advisor can be viewed at **https://webapps.dol.gov/elaws/vets/userra/**.~~

~~C. If you file a complaint with VETS and VETS is unable to resolve it, you may request that your case be referred to the Department of Justice for representation.~~

~~D. You may also bypass the VETS process and bring a civil action against an employer for violations of USERRA.~~

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~~The rights listed here may vary depending on the circumstances. This notice was prepared by VETS, and may be viewed on the Internet at this address: http://www.dol.gov/vets/programs/userra/poster.htm.~~

~~Federal law requires employers to notify employees of their rights under USERRA, and employers may meet this requirement by displaying this notice where they customarily place notices for employees.~~

~~U.S. Department of Labor, Veterans~~
~~Employment and Training Service~~
~~Washington, DC 20210~~
~~1-866-487-2365~~

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~~PROFESSIONAL / SUPPORT STAFF~~
~~CONFERENCES / VISITATIONS / WORKSHOPS~~

~~To attend meetings or conferences, employees must obtain approval from the administration at least twenty (20) days prior to the meeting or conference dates (whenever such prior request is possible).~~

~~The following guides will be used in granting released time and/or travel expense:~~

~~A. Value of the meeting or conference.~~

~~B. Funds available in the appropriate budgets.~~

~~C. Availability of a substitute, if one is necessary.~~

~~With prior approval, expenses associated with authorized employee attendance at meetings and conferences may be eligible for compensation in accordance with District Policy DKC. Staff member travel and expense for participation in student field trips and excursions shall be in accordance with District Policy IJOA.~~

~~Employee absences for attendance at or participation in professional association activities are not eligible for compensation under the employee's contract or work agreement. The District may authorize an employee to take other eligible unused accumulated compensated leave for a personal, professional, or other lawful purpose.~~

~~For the purpose of this policy, professional association activities for which compensation is not available do not include in-service training in the certificated employee's assigned area of employment.~~

~~Adopted: _____~~

~~LEGAL REF.:~~
~~A.R.S.~~
~~15-504~~
~~38-621~~

~~CROSS REF.:~~
~~GCB - Professional Staff Contracts and Compensation~~
~~GCC - Professional/Support Staff Leaves of Absence~~
~~GDB - Support Staff Contracts and Compensation~~
~~IJOA - Field Trips~~

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ADVISORY 999

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~~SABBATICAL LEAVE~~

~~Sabbatical leave may be granted to certificated teaching and administrative personnel for a maximum of one (1) year when conforming to Arizona Revised Statute, 15-510.~~

~~Application for sabbatical leave must be received by March 15. It will be considered within the framework of all applicable law, on the basis of improvement of professional preparation and/or the educational program of the District, current assignment of the individual, value of the leave to the District, and funds that are available.~~

~~An employee's sabbatical leave will be governed by applicable Arizona Revised Statutes.~~

~~Adopted: _____~~

~~LEGAL REF.:~~
~~A.R.S.~~
~~15-510~~
~~A.G.O.~~
~~I81-053~~

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ADVISORY 1000

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~~PROFESSIONAL STAFF VOLUNTARY TRANSFER OF ACCRUED SICK LEAVE~~

~~The District recognizes the existence of circumstances under which non-job-related, seriously incapacitating, and extended illnesses and injury may exhaust accrued leave of certificated employees. To provide some measure of relief in such situations, a limited mechanism, based upon voluntary transfer of accrued leave, is established. The mechanism will be termed *banked sick leave*, or a *sick leave bank*. It is considered of benefit to the District to establish this mechanism because it will reduce the annual accrued sick leave and promote efficiency by ensuring constant service.~~

~~Limits:~~

~~A. The value of banked sick leave will be limited to the equivalent of the number of contract days multiplied by the daily base salary of a teacher with a baccalaureate degree and no experience, or less, depending on contributions.~~

~~B. No employee shall be entitled to receive banked sick leave by reason of contribution or employment.~~

~~C. Each approved applicant is limited to the one (1) time use of no more than one hundred (100) consecutive days of the available limited sick leave from the sick leave bank in any school year.~~

~~D. Additional leave will not be earned/accrued during use of banked sick leave.~~

~~E. All unused banked sick leave will expire at the end of each contract year.~~

~~Voluntary contributions:~~

~~A. Certificated staff members may voluntarily contribute a maximum of _____ days of *earned/accrued* sick leave to the sick leave bank annually. Such contribution must be from the current year's sick leave earned/accrued, the value of which will be determined by the number of days multiplied by the daily base teacher salary.~~

~~B. Each certificated staff member contributing leave to the sick leave bank must acknowledge an uncoerced, voluntary release of the leave, the value it represents, and that it will not be returned but will expire at the end of the contract year in which it is contributed.~~

~~C. In case of contributions exceeding the value of the sick leave bank limit, each contribution will be accepted on a first-come, first-served basis by date of signature.~~

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~~***Eligibility (for use of sick leave bank).*** The approved applicant shall:~~

~~A. Be a full-time teaching employee.~~

~~B. Have a non-job-related, seriously incapacitating, and extended illness or injury.~~

~~C. Have exhausted all earned/accrued leave of any nature or kind.~~

~~D. Be presently on unpaid leave status with the District.~~

~~E. Not be eligible for disability benefits, including but not limited to Social Security, provided at District expense.~~

~~F. Be one whose return to duty is projected to occur within a period no longer than six (6) months.~~

~~***Determining eligibility:***~~

~~The Superintendent shall receive the applications and shall screen for and determine eligibility.~~

~~No continuing rights are established by this policy. In compliance with established procedure, the Governing Board reserves the right to modify or rescind any policy in accord with its own guidelines.~~

~~Adopted: _____~~

~~LEGAL REF.:~~
~~A.G.O.~~
~~I91-027~~

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~~REGULATION~~

~~PROFESSIONAL STAFF VOLUNTARY TRANSFER OF ACCRUED SICK LEAVE~~

~~(Application)~~

~~The application must be in writing.~~

~~The application must be supported by documentation from a health care professional confirming the need for receipt of sick-leave bank assistance related to health needs. In cases of domestic violence, sexual violence, abuse or stalking, documentation from the employee, as defined in A.R.S. 23-373, shall be considered reasonable documentation.~~

~~Data in the application shall include an expected date for return to duty.~~

~~The application shall be received by the District office within ten (10) days following the applicant beginning unpaid leave status.~~

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~~REGULATION~~

~~PROFESSIONAL STAFF VOLUNTARY TRANSFER OF ACCRUED SICK LEAVE~~

~~(Application Screening Committee)~~

~~A committee consisting of one (1) staff member from each building and one (1) from the central staff selected by the staff and an administrator appointed by the Superintendent shall review each application and submit a recommendation to the Superintendent. The applications are to be reviewed in accord with the guidelines found in policy and as presented below:~~

~~A. The application must be in writing.~~

~~B. The application must be supported by the appropriate documentation as defined in A.R.S. 23-373.~~

~~C. Data in the application shall include the expected date for return to duty.~~

~~D. The application shall be received by the District office within ten (10) days following the beginning of the applicant's unpaid-leave status.~~

~~For approval, the applicant shall:~~

~~A. Be a full-time employee.~~

~~B. Have a non-job-related need, as defined in A.R.S. 23-373, for sick leave.~~

~~C. Be presently on unpaid-leave status with the District.~~

~~D. Not be eligible for disability benefits, including but not limited to Social Security, provided at District expense.~~

~~E. Be one whose return to duty is projected to occur within a period no longer than six (6) months.~~

~~F. Submit an application, which shall be received by the District office within ten (10) days following the beginning of the applicant's unpaid-leave status.~~

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ADVISORY 1001

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~~PROFESSIONAL / SUPPORT STAFF~~
~~BEREAVEMENT LEAVE~~

~~An employee may be granted, upon request to the Superintendent, up to five (5) days of leave per year, with pay, to be used in the event of death of an employee's family member as defined in Policy GCCA.~~

~~Extensions of bereavement leave may be granted upon personal request to the Superintendent. If approved, all such extensions of bereavement leave shall be deducted from the employee's accrued sick leave.~~

~~In the absence of any accumulated sick leave, and upon request, the Superintendent may approve an unpaid leave of absence for each day of extended bereavement leave used.~~

~~Adopted: _____~~

~~LEGAL REF.:~~
~~A.R.S.~~
~~15-502~~

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ADVISORY 1002

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~~GCD ©~~
~~PROFESSIONAL STAFF~~
~~VACATIONS AND HOLIDAYS~~

~~Vacations~~

~~Twelve (12) month administrators earn four (4) weeks of vacation, which shall be taken when school is not in session. Vacation may accumulate to a maximum of _____ days, at which time no more vacation can be earned. As accumulated vacation days are used and drop below _____ days, an eligible employee may again accumulate vacation up to the maximum limit. If workloads disallow vacations as established, the Superintendent may approve vacation days during the school year.~~

~~Holidays~~

~~When July 4, Veterans Day, December 25, or Thanksgiving Day occurs within the school week, the schools shall be closed and the compensation of the teachers shall not be diminished on that account. The Governing Board may declare a recess during the Christmas holiday season not to exceed two (2) school weeks, and teachers shall receive compensation during the recess.~~

~~Other holidays will be established by the Board and noted on each year's school calendar.~~

~~Adopted: _____~~

~~LEGAL REF.:~~
~~A.R.S.~~
~~15-502~~
~~15-801~~
~~38-608~~

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ADVISORY 1003

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~~PROFESSIONAL STAFF~~ HIRING

~~It shall be the policy of t~~The District will strive to employ and retain the ~~best~~ most qualified personnel.~~.~~ ~~This will be accomplished by considering qualifications and by providing competitive salary schedules within the financial capability of the District, adequate facilities, and good~~ ensure competitive compensation, provide safe facilities and favorable working conditions.

~~Before employing a certificated or noncertificated person, school districts and charter schools shall conduct a search of the prospective employee on the educator information system that is maintained by the Department of Education.~~

Requirements

Per A.R.S. 15-505, ~~A~~a school district or charter school may not employ either of the following in a position that requires a valid fingerprint clearance card:

A. A certificated person whose certificate has been suspended, surrendered or revoked, unless the State Board of Education has subsequently reinstated the person's certificate.

B. A noncertificated person who has been prohibited from employment at a school district or charter school by the State Board of Education pursuant to A.R.S. 15-505.

Candidates shall disclose whether they have pled guilty, pled no contest, been convicted of or are awaiting trial pursuant to A.R.S. 15-509.

Each school district and charter school shall annually submit to the Department of Education a list of certificated and noncertificated persons who are employed at the school district or charter school. The department shall issue guidance to school districts and charter schools regarding this requirement.

Selection Process

The Board ~~has the legal responsibility of~~ approves~~ing~~ the employment of all employees~~. While this responsibility cannot be waived, the Board~~ but may assign~~s~~ to the Superintendent the process of recruiting and selecting staff members. In carrying out this responsibility, the Superintendent may involve other staff members as needed. All personnel selected for employment must be recommended by the Superintendent and approved by the Board.

Criteria

The Board adopts the following general criteria, which shall be utilized in the selection process for initial employment:

A. There will be no discrimination ~~in the hiring process~~ due to race, color, religion, sex, age, national origin, ~~or~~ disability or any other basis prohibited by law in the hiring process of an otherwise qualified individual.

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B. Candidates for all ~~professional~~ positions shall be mentally and physically qualified for and have the education and/or training necessary to perform the instructional duties or functions for which they have applied.

C. Each candidate for a certificated position shall provide evidence of meeting state requirements for certification.

D. Each candidate shall be requested to complete a consent-and-release form regarding conduct of a background investigation.

E. A "background investigation" - consisting of communication with the applicant's (or employee's) former employer that concerns education, training, experience, qualifications, and job performance for the purpose of evaluation for employment - shall be conducted on each individual to be considered for a recommendation of employment. Forms developed for this purpose are to be used.

Information obtained about an employee or applicant for employment by the District in the performance of a background investigation, including any records indicating that a current or former employee of a school or school district was disciplined for violating policies of the School District Governing Board pursuant to A.R.S. 15-153, may be retained by that district and may be provided to any school district or other public school that is performing a background investigation.

Any employee's misstatement of fact that is material to qualifications for employment or the determination of salary shall be considered by the Board to constitute grounds for dismissal.

Employment

Before ~~employment, schools or~~ employing a certificated or noncertificated person, school districts and charter schools shall ~~verify the certification and fingerprint status of applicants who apply for school or school district positions that require certification~~ conduct a search of the prospective employee on the educator information system that is maintained by the Department of Education.

Additionally, for positions that require certification, schools or school districts shall verify the applicant's certification and fingerprint status.

~~Should the need arise to employ a teacher who meets the requirements for a conditional certificate before an applicant has obtained the appropriate valid fingerprint clearance card, the District may assist in obtaining the conditional certificate, and employ the teacher, by meeting all of the following conditions:~~ Subject to the conditions below, a district may hire and place an employee into services before receiving the results of the mandatory fingerprint check or before a fingerprint clearance card is issued or denied. However, until fingerprint clearance has been received, an applicant who is required or allowed to have unsupervised contact with

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students shall not be placed into service unless the applicable requirements below are met.

A. *Certificated*: The District verifies in writing on a form provided by the Arizona Department of Education (ADE) the necessity for hiring and placing the applicant into service before a fingerprint~~ing~~ check is completed.

Noncertificated: The District documents in the applicant's file the necessity for hiring and placing the applicant into service before a fingerprint check could be completed or a fingerprint clearance card could be issued.

B. The District ensures that ~~obtains from~~ the Department of Public Safety completes a state-wide criminal records check on the applicant. Subsequent statewide criminal records ~~checks~~ must be completed every one hundred twenty (120) days until ~~a permanent certificate is received~~ the date the fingerprint check is completed or the fingerprint clearance card is issued or denied, as applicable.

C. *Certificated*: The District ~~searches the~~ completes a search of criminal records ~~of~~ in all local jurisdictions outside Arizona where the applicant has lived in the previous five (5) years.

D. The District obtains references from the applicant's current employer and two (2) most recent previous employers, except that for applicants who have been employed for at least five (5) years by the most recent employer, only references from that employer are required.

E. The District provides general supervision of the applicant until permanent certification is issued by ADE or until the date the fingerprint check is completed or the fingerprint clearance card is issued or denied, as applicable.

F. Before an applicant is employed for a certificated position, the District shall verify the certification and fingerprint status of an applicant.

E-Verify

Upon recommendation for employment the District shall confirm employment authorization and employment eligibility verification required by A.R.S. 23-214 ~~participating in the E-Verify program of the Department of Homeland Security's (DHS) U.S. Citizenship and Immigration Services Bureau (USCIS) and the Social Security Administration (SSA). The District will then complete the Form I-9 as required and maintain the form with copies of the necessary documents and documentation of the authorization and verification pending any inquiry~~.

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~~The Superintendent of Public Instruction may also impose any additional conditions or restrictions deemed necessary.~~

Fingerprints and Criminal History

Noncertificated Applicants

The District must report to the Superintendent of Public Instruction on June 30 and December 31 of each year the number of applicants hired prior to the completion of a fingerprint check or the issuance of a fingerprint clearance card and the number of applicants for whom fingerprint checks or fingerprint clearance cards have not been received after one hundred twenty (120) days and after one hundred seventy-five (175) days of hire.

The District may provide information received as a result of a fingerprint check required by A.R.S. 15-512 to any other school district if requested to do so by the person who was the subject of the fingerprint check or communicate to any school district if requested to do so by the person who applied for a fingerprint clearance card whether the person has been issued or denied a fingerprint clearance card. A copy of any written communication regarding employment must be sent by the employer providing the information to the person's last known address.

The Superintendent of Public Instruction may also impose any additional conditions or restrictions deemed necessary.

Criminal History

Any person who permits unauthorized access to criminal history record information, releases criminal history record information, or procures the release or uses criminal history record information other than in accord with A.R.S. 41-1750 is guilty of a Class 6 felony.

Acceptance of Contract

Certificated Applicant

A ~~professional~~ certificated candidate's acceptance of a contract offer must be indicated within _____ (_____) business days from the date of the written contract or the offer is revoked. Written notice of the deadline date for acceptance shall be included in the contract offer or an attachment to the contract offer. The candidate accepts the contract by signing the contract and returning it to the Governing Board or by making a written instrument which accepts the terms of the contract and delivering it to the Governing Board. If the written instrument includes terms in addition to the terms of the contract offered by the Board, the candidate fails to accept the contract.

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Oath of Office

Every school employee shall take and subscribe to the oath prescribed for public officers pursuant to A.R.S. 38-231. The person taking the oath shall file a copy of the acknowledged oath in the District office. The District office shall keep such copy on file as long as the employee remains employed by the District and for a period of five (5) years after termination of employment with the District.

Adopted: _____

LEGAL REF.:
A.R.S.
13-3716
15-153
15-502
15-503
15-505
15-509
15-512
15-534
15-536
15-538.01
15-539
15-550
23-211
23-212
23-214
23-1361
38-201
38-231
38-232
38-481
38-766.01
41-1750
41-1756

CROSS REF.:
GCB - ~~Professional Staff Contracts and~~ Compensation
GCFC - ~~Professional Staff Certification and Credentialing Requirements (f~~Fingerprinting R~~r~~equirements~~)~~
GCO – Evaluations and Contracts ~~of Professional Staff Members~~

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REGULATION

~~PROFESSIONAL STAFF~~ HIRING

Definition

A *background investigation* is defined as any communication with an applicant's (or employee's) former employer that concerns the education, training, experience, qualifications, and job performance of the individual and that is used for the purpose of evaluation for employment. Background investigation does not include the results of any state or federal criminal history records check.

Background Investigation Requirements

Only persons designated by the Superintendent shall perform background investigations. Prior to contacting former employers or other persons, the background investigator shall:

A. Ascertain that the standard employment application for the type of position has been completed in full.

B. Obtain from the individual a consent to background investigation and release as determined by the District.

C. Make certain that the individual has identified at least two (2) persons from each past employer who can verify basic job information and discuss the individual's work performance and reason for leaving.

D. Examine the application for a complete work history, accounting for any gaps in employment.

Two (2) persons should be contacted at each past employer if possible (any exceptions should be documented). Upon making contact, the contacts or the former employer or employer's agent should be provided the following information:

A. The name and identifying information of the District.

B. The name of the District representative making the inquiry and how the representative can be contacted.

C. The name of the former employee and period of employment as indicated by the individual whose background is being investigated.

D. The position for which the individual has applied, with descriptive information as to the duties, if requested or necessary to understanding of the inquiry.

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The background investigator shall:

A. Ask the questions, and complete the background check form(s) as provided by the District.

B. Make impression notes as necessary based upon the questions and responses, and determine if there may be cause to contact others or make further inquiries based upon the responses.

C. Provide the information to the Superintendent.

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EXHIBIT

~~PROFESSIONAL STAFF~~ HIRING

CONSENT TO CONDUCT BACKGROUND INVESTIGATION AND RELEASE

I, _____ [applicant's name], have applied for employment with the _____ School District ~~to work as a~~ for the position of _____ [job title]. I understand that in order for the School District to determine my eligibility, qualifications, and suitability for employment, the School District will conduct a background investigation to determine if I am to be considered for an offer of employment. This investigation may include ~~asking~~ contacting my current employer, any former employer, and any educational institution I have attended ~~about~~ regarding my education, training, experience, qualifications, job performance, professional conduct, and evaluations, as well as confirming my dates of employment or enrollment, position(s) held, reason(s) for leaving employment, whether I ~~could be~~ am eligible for rehire~~d~~, reasons for not rehiring me (if applicable), and similar information.

I hereby give my consent for any employer or educational institution to release any information requested in connection with this background investigation.

~~According~~ Pursuant to the Family Educational Rights and Privacy Act, I understand that I have ~~a~~ the right to ~~see~~ inspect most education records ~~that are~~ maintained by any educational institution.

In light of the preceding paragraph, I waive _____/do not waive _____ (initial only one [1]) my right to ~~see~~ inspect any written reference or other information provided to the School District by any educational institution.

~~According~~ Pursuant to ~~Arizona Revised Statutes Section~~ A.R.S. 23-1361, I understand that any employer that provides a written communication to the School District regarding my current or past employment must send me a copy at my last known address. I acknowledge that some employers are unwilling to provide factual written references concerning a current or past employee unless they may do so confidentially, without revealing the references to the employee, and that the School District ~~will~~ may ~~not further consider~~ discontinue consideration of my application if it ~~cannot~~ is unable to complete its background investigation.

In light of the preceding paragraph, I waive _____/do not waive _____ (initial only one [1]) my right to receive a copy of any written communication furnished to the School District by any employer.

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Whether or not I have waived my right to ~~see~~ inspect or ~~to~~ receive copies of written references furnished to the School District by employers or educational institutions, I release, hold harmless, and agree not to sue or file any claim of any kind against any current or former employer or educational institution, and any officer or employee ~~of either~~ thereof, that in good faith furnishes written or oral references requested by this School District to complete its background investigation.

A ~~photocopy or facsimile ("fax")~~ copy of this form that shows my signature shall be as valid as an original.

DATED this _____ day of _____, 20_____.

_____ _____

Witness Applicant

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EXHIBIT

~~PROFESSIONAL STAFF~~ HIRING

BACKGROUND CHECK FORM

Applicant _____ Date _____

Person contacted _____ Telephone _____

Address _____

E-mail address _____

Relationship to applicant:

☐ Former employer - position _____

District, business, or other entity _____

☐ Personal reference

Method of contact: ☐ Telephone ☐ Letter ☐ Other _____

QUESTIONS FOR EMPLOYERS

Dates of employment _____

Position held _____

Final rate of pay _____

Was the person reliable? _____ If no, explain _____

Was the person's job performance satisfactory? _____ If no, explain _____

_____

Was there a~~A~~ny concern about the person ~~being late to work without authorization~~ related to punctuality, unauthorized tardiness, or other work schedule matters? _____

If yes, explain _____

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Was there a~~A~~ny concern ~~with~~ regarding abuse of leave policies (such as sick leave or personal leave)? _____

If yes, explain _____

Did the person have a~~A~~ny difficulty establishing ~~communication and~~ rapport and communicating with children? _____

If yes, explain _____

Did the person have a~~A~~ny difficulty~~ies in~~ establishing ~~communication and~~ rapport and communicating with supervisors, parents, or community members? _____

If yes, explain _____

Did the person ever receive a written counseling statement, letter of direction, or reprimand? _____

If yes, describe _____

Did the ~~District~~ employer ever consider taking action or take action to suspend, decline to renew, or dismiss the employee? _____

If yes, describe _____

Was there ever an allegation or complaint ~~about~~ involving any of the following:

Abusive language? _____

Insulting or derogatory comments? _____

Inappropriate contact with a child? _____

Verbal or physical contact of a sexual nature? _____

Dishonesty? _____

Substance abuse? _____

Failure to provide adequate supervision? _____

Failure to follow reasonable directions or instructions? _____

If yes ~~on~~ to any of the above, ~~get explanation~~ explain _____

_____

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Was the person ever involved in an incident
that resulted in injury to an adult or child? _____

If yes, explain _____

Would you rehire this person? _____

_____

Can you identify anyone else who could provide relevant information regarding the applicant's fitness for employment? _____

_____

Is there any other information I have not asked about that
would help us determine this person's eligibility, qualifications, and suitability for employment with our District? _____

_____

QUESTIONS FOR PERSONAL REFERENCE

How long have you known the applicant? _____

What is the nature of your relationship? _____

Why do you think the applicant would be a good choice for this position?

_____

Do you know of any reasons that ~~could prevent~~ would affect
the applicant's ~~from fulfilling the functions of~~ suitability for
the position? _____

_____

Background check form completed by _____

Date completed _____

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EXHIBIT

~~PROFESSIONAL STAFF~~ HIRING

~~AFFIRMATION~~ ACKNOWLEDGEMENT OF A RETIRED EMPLOYEE UPON RETURN TO EMPLOYMENT

To satisfy the requirements of A.R.S. 38-766.01~~, and to retain my eligibility to receive retirement benefits from the Arizona State Retirement System (ASRS)~~ following my return to employment ~~following~~ after a qualified retirement, ~~by my signature below~~ I affirm ~~my awareness and acceptance of the following provisions~~ by my signature below that I understand and accept the following:

A. I have attained ~~a~~ normal retirement age as defined by the Arizona State Retirement System (ASRS).

B. I ~~am returning to greater than half (1/2) time employment not sooner than twelve (12) months following my termination of full-time employment for the purpose of retirement~~ terminated direct employment with an employer at least three hundred sixty-five (365) consecutive days before returning to work.

C. If I return to work as a certificated teacher, my employment is not subject to the requirements prescribed in A.R.S. 15-536, 15-538, 15-538.01, and 15-539 through 15-543.

D. I understand that:

1. pursuant to A.R.S. 38-766.01 my election to return to work is irrevocable for the remainder of the employment for which I ~~have made~~ make this election~~,~~; and

2. I must make this acknowledgement in writing and file it with my employer within thirty (30) days ~~of~~ after returning to work~~.~~ ; and

3. during this period of employment, no ASRS contributions will be made on my behalf, and I will not accrue credited service, additional retirement benefits, or long-term disability benefits.

_____ _____

Signature Date

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EXHIBIT

~~PROFESSIONAL STAFF~~ HIRING

PROCEDURES AND PRACTICES FOR EMPLOYMENT AUTHORIZATION AND EMPLOYMENT ELIGIBILITY VERIFICATION

Anti-Discrimination Notice. It is ~~illegal~~ unlawful to discriminate ~~against any individual (other than an alien not authorized to work in the U.S.)~~ in hiring, discharging, or recruiting or referring for a fee because of ~~that~~ an individual's national origin or citizenship status,~~. It is illegal to discriminate against work eligible individuals~~ except with respect to an individual who is not authorized to work in the United States (8 U.S.C. 1324a and 1324b). Employers cannot specify which document(s) ~~they will accept from~~ an employee must present for Form I-9 completion. The refusal to hire an individual because of a future document expiration date may also constitute illegal discrimination.

Employment Authorization
~~Procedure~~ Verification

~~Arizona schools must use the federal government's Basic Pilot Program to verify the employment authorization of all newly hired employees.~~

~~The Department of Homeland Security's (DHS) U.S. Citizenship and Immigration Services Bureau (USCIS) and the Social Security Administration (SSA) are jointly conducting E-Verify, formerly known as the Basic Pilot. E-Verify involves verification checks of the SSA and DHS databases, using an automated system to verify the employment authorization~~ Pursuant to the Immigration Reform and Control Act (IRCA) and A.R.S. 23-214, the District shall verify the employment eligibility of all newly hired employees. This verification process includes:

~~There are four (4) types of access to E-Verify: As an employer, as a designated agent for employers, as a multi-location corporate administrator, or through a web service.~~

~~Users can access the web-based access methods using any Internet-capable Windows based personal computer and a web browser of Internet Explorer 5.5 or Netscape 4.7 or higher (with the exception of Netscape 7.0).~~

~~To participate, an employer must register online and accept the electronic Memorandum of Understanding (MOU) that sets forth the responsibilities of the SSA, USCIS and the employer.~~

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~~The following e-mail address will allow navigation to both instructions and forms for the I-9 for verifying the identity and employment authorization of individuals hired for employment in the United States:~~

~~https://www.uscis.gov/i-9~~

~~Form I-9 may be completed as soon as the employer has offered the individual a job and the individual has accepted the offer. Each newly hired employee must complete and sign Section 1 of Form I-9 no later than his or her first day of employment.~~

~~If you need assistance in completing the registration process or need additional information relating to E-Verify, please call the Office of Verification toll free at 1-888-464-4218.~~

~~I-9 Form Completion~~

~~The Immigration Reform and Control Act of 1986 (IRCA) requires that all new employees, both regular and casual, establish their eligibility for employment in the United States. This federal law applies to U.S. citizens as well as to foreign nationals.~~

~~The Employment Eligibility Verification (Form I-9) must be completed as follows:~~

~~Section 1. Employee Information and Attestation~~

~~Employees must complete and sign Section 1 of Form I-9 no later than the first day of employment, but not before accepting a job offer.)~~

~~Section 2. Employer or Authorized Representative Review and Verification~~

~~Employers or their authorized representative must complete and sign Section 2 within three (3) business days of the employee's first day of employment.~~

A. Form I-9 Completion:

1. Each newly hired employee must complete and sign Section 1 of Form I-9 no later than the first day of employment and only after accepting a job offer.

2. The District, as the employer, must complete and sign Section 2 of Form I-9 within three (3) business days of the employee's first day of employment (8 C.F.R. 274a.2).

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B. E-Verify Participation. The District shall comply with A.R.S. sections 23-214 and 41-4401 as applicable to District employees and District contractors and subcontractors.

Resources

Information and instructions regarding Form I-9 are available at: https://www.uscis.gov/i-9.

E-Verify program resources are available at: https://www.e-verify.gov.

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EXHIBIT

HIRING

OATH OF OFFICE

In addition to any other form of oath or affirmation specifically provided by law for an officer or employee, before entering upon the duties of office or employment, any officer or employee shall take and subscribe to the following oath or affirmation:

State of Arizona, County of _____,
I, _____ [type or print name], do solemnly swear (or affirm) that I will support the Constitution of the United States and the Constitution and laws of the State of Arizona; that I will bear true faith and allegiance to the same, and defend them against all enemies, foreign and domestic, and that I will faithfully and impartially discharge the duties of the office of _____ [name of office] according to the best of my ability, so help me God (or so I do affirm).

_____
(Signature of officer or employee)

LEGAL REF.:
A.R.S.
38-231

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GCF-EF ©

EXHIBIT

HIRING

NONCERTIFICATED NOTICE OF EMPLOYMENT AND WAGE TERMS

☐ New Hire ☐ Wage/Status Change

Employee: _____ Position: _____

Supervisor: _____

Effective Date: _____/_____/_____

Rate: $_____

(*If change*) Prior Rate: $_____ → New Rate: $_____

Work Schedule (attach if needed): _____

Governing Board action on ____/____/ _____

Acknowledgments (check all that apply):

☐ I received the position description and understand the duties and requirements.

☐ I acknowledge this notice does not alter my employment status (at-will employees have no expectation of continued employment).

☐ I will comply with Governing Board policies and administrative regulations.

☐ I received information on hourly rate of pay, pay periods, timekeeping, and overtime rules (if non-exempt).

Employee Signature _____ Date _____

Superintendent Signature _____ Date _____

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ADVISORY 1004

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~~PROFESSIONAL STAFF CERTIFICATION AND CREDENTIALING~~ FINGERPRINTING REQUIREMENTS

~~(Fingerprinting Requirements)~~

New Hires

Certificated Employees

All certificated personnel ~~to be~~ hired by the District shall be fingerprinted as a condition of employment, except ~~for personnel~~ those who, as a condition of certification are required to ~~have~~ hold a valid fingerprint clearance card.

~~The candidate's f~~Fingerprints shall be submitted, along with the form ~~presented as an exhibit to this policy~~ GCFC-E, immediately upon ~~being~~ notifi~~ed~~cation of possible employment. The form shall be ~~considered a~~ part of the application for employment.

An expired fingerprint clearance card may be used ~~to satisfy the fingerprint requirements of section 15-183, 15-503, 15-512, 15-534, 15-782.02, 15-1330 or 15-1881~~ if the person signs an affidavit ~~stating both of the following~~ affirming that:

A. ~~The person submitted a~~ A completed application for renewal was submitted to the ~~Finger Printing Division of the~~ Department of Public Safety (DPS) ~~for a new fingerprint clearance card~~ within ninety (90) days before ~~the~~ expiration ~~date on the person's current fingerprint clearance card.~~, and

B. The person is not awaiting trial on, and has not been convicted of, a disqualifying criminal offense ~~that would make the person ineligible for a fingerprint clearance card~~.

This does not apply to a fingerprint clearance card that has been denied, suspended or revoked or to a person who has requested a good cause exception hearing.

Noncertificated Employees

All newly hired noncertificated personnel, and unpaid personnel who are not the parent or guardian of a student but who provide direct services to students without the supervision of a certificated employee, shall be fingerprinted as a condition of employment under A.R.S. 15-512, except:

A. Personnel fingerprinted as a condition of licensing, if the license is required for employment.

B. Personnel previously employed by the District and reemployed within one (1) year of termination.

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Additional provisions:

A. The District may require noncertificated or unpaid personnel to obtain a fingerprint clearance card as a condition of employment.

B. For the purposes of this policy, *supervision* means under the direction of and, except for brief periods, within sight of a certificated employee while providing direct services to students.

C. If a fingerprint clearance card is not required, such personnel may still apply for one, and the District may share results or status with other school districts for employment purposes.

D. Fingerprints and the form GCFC-E must be submitted within twenty (20) days of beginning work. Employment may be terminated if information on the affidavit is inconsistent with the fingerprint check or fingerprint clearance card results.

E. The District may fingerprint or require a fingerprint clearance card for any other employee or applicant not otherwise required by law.

All Employees:

A. The District shall assume the cost of fingerprint checks and clearance card applications but may assess paid employees for actual costs. Unpaid personnel will not be charged.

B. ~~Candidates shall certify on the prescribed notarized forms~~ Individuals shall complete the form GCFC-E, certifying whether they are awaiting trial on or have ever been convicted of or admitted ~~in open court or pursuant to a plea agreement committing~~ to, any of the following criminal offenses in Arizona or similar offenses in any other jurisdictions, including ~~a~~ charges or convictions that ~~has~~ have been vacated, set aside or expunged:

1. ~~A.~~ Sexual abuse of a minor.

2. ~~B.~~ Incest.

3. ~~C.~~ First- or second-degree murder.

4. ~~D.~~ Kidnapping.

5. ~~E.~~ Arson.

6. ~~F.~~ Sexual assault.

7. ~~G.~~ Sexual exploitation of a minor.

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8. ~~H.~~ Felony offenses involving contributing to the delinquency of a minor.

9. ~~I.~~ Commercial sexual exploitation of a minor.

10. ~~J.~~ Felony offenses involving the sale, distribution, or transportation of~~, offer to sell, transport, or distribute, or conspiracy to sell, transport, or distribute~~ marijuana, ~~or~~ dangerous drugs, or narcotic drugs.

11. ~~K.~~ Felony offenses involving ~~the~~ possession or use of marijuana, dangerous drugs, or narcotic drugs.

12. ~~L.~~ Misdemeanor offenses involving ~~the~~ possession or use of marijuana or dangerous drugs.

13. ~~M.~~ Burglary in the first degree.

14. ~~N.~~ Burglary in the second or third degree.

15. ~~O.~~ Aggravated or armed robbery.

16. ~~P.~~ Robbery.

17. ~~Q.~~ A dangerous crime against children as defined in A.R.S. 13-705.

18. ~~R.~~ Child abuse.

19. ~~S.~~ Sexual conduct with a minor.

20. ~~T.~~ Molestation of a child.

21. ~~U.~~ Manslaughter.

22. ~~V.~~ Aggravated assault.

23. ~~W.~~ Assault.

24. ~~X.~~ Exploitation of minors involving drug offenses.

25. ~~Y.~~ Sexual abuse under A.R.S. 13-1404 or sexual assault under 13-1406 in which the victim was a minor.

26. ~~Z.~~ An act committed in another ~~state or territory~~ jurisdiction that if committed in this state would ~~have been subject to disclosure under Q and Y above~~ fall under the above Arizona provisions.

27. ~~AA.~~ Any crime ~~that~~ requires~~ing~~ ~~the person to register as a~~ sex offender registration pursuant to (A.R.S. 13-3821).

28. ~~AB.~~ ~~A p~~Preparatory offenses ~~as prescribed in~~ (A.R.S. 13-1001) of any ~~offense that is subject to disclosure under Q, S, Y, Z, or AA~~ crime listed above.

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False statements on the form GCFC-E are ~~A person who makes a false statement, representation, or certification in any application for employment with the School District is guilty of~~ a Class 3 misdemeanor. The District may refuse to hire or may review or terminate personnel ~~who have been~~ convicted of or who have admitted ~~committing any of the criminal offenses above or a similar offense in another jurisdiction. In conducting a review~~ to such offenses, consistent with A.R.S. 15-512. In making determinations, the Governing Board shall ~~utilize the guidelines, including the list of offenses that are not subject to review, as prescribed by the State Board of Education pursuant to A.R.S. 15-534. In considering whether to hire or terminate the employment of a person, the Governing Board shall take into account the factors listed in A.R.S. 15-512~~ consider the statutory factors. Before termination under A.R.S. 15-512, a hearing shall be held.

~~When considering termination of an employee pursuant to A.R.S. 15-512, a hearing shall be held to determine whether a person already employed shall be terminated.~~

Identity Verified Prints (IVP) Fingerprint Clearance Card Requirements

The following individuals must obtain an IVP Fingerprint Clearance Card pursuant to A.R.S. 15-106:

A. Applicants for a new teaching certificate to teach in a school district.

B. Participants in field experience or student teaching in Arizona.

C. Applicants for renewal of a teaching certificate in order to continue teaching in a school district.

D. Applicants required for the first time to be fingerprinted to teach in a charter school and applicants required to renew fingerprints to continue teaching in a charter school under A.R.S. 15-183.

E. Applicants required to be fingerprinted under A.R.S. 15-512.

F. Individuals contracted by this state, a school district, or a charter school to provide tutoring services.

Exceptions:

A. A person who participates in a teacher preparation program that is approved by the State Board of Education and who does not participate in field experience or student teaching in Arizona shall not be required to obtain a fingerprint clearance card pursuant to A.R.S. 15-106.

B. A person who has a set of identity verified fingerprints on file with the Department of Public Safety pursuant to A.R.S. 15-106 shall not be required to submit a new set of fingerprints to the DPS to renew the person's fingerprint clearance card.

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Required Employment Process

The Superintendent shall develop and implement procedures ~~that include the following in the employment process~~ to ensure compliance with this policy and A.R.S. 15-106, 15-512, and 41-1750, including:

A. Providing~~e~~ for fingerprinting of ~~employees~~ covered employees ~~under this policy and A.R.S. 15-512~~.

B. Submitting ~~Provide for~~ fingerprint checks pursuant to A.R.S. 41-1750.

C. Collecting and depositing fingerprinting fees with the county treasurer as required by A.R.S. 15-512.

Adopted: _____

LEGAL REF.:
A.R.S.
13-705
15-183
15-503
15-509
15-512
15-534
15-782.02
15-1330
15-1881
23-1361
41-1750
41-1758.07

CROSS REF.:
GCF - ~~Professional Staff~~ Hiring
GCG - Part-Time and Substitute ~~Professional Staff~~ Employment
IJOC - School Volunteers

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EXHIBIT

~~PROFESSIONAL STAFF CERTIFICATION AND CREDENTIALING~~ FINGERPRINTING REQUIREMENTS

AFFIDAVIT OF CRIMINAL HISTORY

_____ _____
Name (typed or printed) Position

I, _____, being duly sworn, do hereby certify that I have never been convicted of or admitted in open court or pursuant to a plea agreement committing, and am not now awaiting trial for committing, any of the following criminal offenses in the state of Arizona or similar offenses in any other jurisdiction, including a charge or conviction that has been vacated, set aside or expunged:

1 ~~A.~~ Sexual abuse of a minor.

2 ~~B.~~ Incest.

3 ~~C.~~ First- or second-degree murder.

4 ~~D~~. Kidnapping.

5 ~~E~~. Arson.

6 ~~F~~. Sexual assault.

7 ~~G~~. Sexual exploitation of a minor.

8 ~~H~~. Felony offenses involving contributing to the delinquency of a minor.

9 ~~I~~. Commercial sexual exploitation of a minor.

10 ~~J~~. Felony offenses involving the sale, distribution, or transportation of~~, offer to sell, transport, or distribute, or conspiracy to sell, transport, or distribute~~ marijuana, ~~or~~ dangerous drugs, or narcotic drugs.

11 ~~K~~. Felony offenses involving the possession or use of marijuana, dangerous drugs, or narcotic drugs.

12 ~~L~~. Misdemeanor offenses involving the possession or use of marijuana or dangerous drugs.

13 ~~M~~. Burglary in the first degree.

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14 ~~N~~. Burglary in the second or third degree.

15 ~~O~~. Aggravated or armed robbery.

16 ~~P~~. Robbery.

17 ~~Q~~. A dangerous crime against children as defined in A.R.S. 13-705.

18 ~~R~~. Child abuse.

19 ~~S~~. Sexual conduct with a minor.

20 ~~T~~. Molestation of a child.

21 ~~U~~. Manslaughter.

22 ~~V~~. Aggravated assault.

23 ~~W~~. Assault.

24 ~~X~~. Exploitation of minors involving drug offenses.

25 ~~Y~~. Sexual abuse under A.R.S. 13-1404 or sexual assault under 13-1406 in which the victim was a minor.

26 ~~Z~~. An act committed in another jurisdiction ~~state or territory~~ that if committed in this state would fall ~~have been subject to disclosure~~ under the ~~Q and Y~~ above Arizona provisions.

27 ~~AA~~. Any crime ~~that~~ requiring~~es~~ ~~the person to register as a~~ sex offender registration pursuant to A.R.S. 13-3821.

28 ~~AB~~. ~~A~~ P~~p~~reparatory offenses ~~as prescribed in~~ (A.R.S. 13-1001) of any crime listed ~~offense that is subject to disclosure under Q, S, Y, Z, or AA~~ above.

_____ _____

Employee signature Date signed

Subscribed, sworn to, and acknowledged before me by _____

_____, this _____ day of _____, 20_____,

in _____ County, Arizona.

My Commission Expires

_____ _____

Notary Public

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~~PROFESSIONAL / SUPPORT STAFF~~
~~HIRING - OATH OF OFFICE~~

~~Every school employee shall take and subscribe to the oath prescribed for public officers pursuant to A.R.S. 38-231. The person taking the oath shall file a copy of the acknowledged oath in the District office. The District office shall keep such copy on file as long as the employee remains employed by the District and for a period of five (5) years after termination of employment with the District.~~

~~Adopted: _____~~

~~LEGAL REF.:~~
~~A.R.S.~~
~~38-231~~

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~~GCFE-E ©~~

~~EXHIBIT~~

~~PROFESSIONAL / SUPPORT STAFF HIRING - OATH OF OFFICE~~

~~In addition to any other form of oath or affirmation specifically provided by law for an officer or employee, before entering upon the duties of office or employment, any officer or employee shall take and subscribe to the following oath or affirmation:~~

~~State of Arizona, County of _____, I, _____ [type or print name], do solemnly swear (or affirm) that I will support the Constitution of the United States and the Constitution and laws of the State of Arizona; that I will bear true faith and allegiance to the same, and defend them against all enemies, foreign and domestic, and that I will faithfully and impartially discharge the duties of the office of _____ [name of office] according to the best of my ability, so help me God (or so I do affirm).~~

_____

~~(Signature of officer or employee)~~

~~LEGAL REF.:~~
~~A.R.S.~~
~~38-231~~

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PART - TIME AND SUBSTITUTE ~~PROFESSIONAL STAFF~~ EMPLOYMENT

Substitute Teachers

The Board will establish the daily pay rate for substitute teachers.

The Superintendent will screen all applicants for substitute positions and recommend substitute teachers to the Board for approval. The Superintendent will establish regulations to ensure that all substitutes used in the schools are on the Board-approved substitute list.

~~**Substitute Professional Staff Members**~~

Part-Time Employees

The Superintendent may employ, when conditions warrant, temporary or part-time personnel on a per diem or time card basis. This authority is subject to the following conditions:

A. Continued employment of any such person shall be subject to confirmation and approval by the Board at its next official meeting.

B. The employee shall be hired on a per diem basis and shall be compensated in accordance with the requirements and limitations of existing contracts that cover similar positions or employees.

C. In addition to the conditions set forth above, the temporary assignment of a person to a supervisory or administrative position shall be preceded by notification to the Board. The Superintendent will detail the circumstances that created the need for the part-time employment.

==========

Optional language: **The following outlined item (to the next double line) is available for inclusion in whole or in part at the discretion of school districts having only one (1) school or fewer than 600 students as determined by the local Governing Board.**

Small School Districts;
Substitute Teachers

A *small school district*, as defined in A.R.S. 15-901, is allowed to employ a substitute teacher who is related to a member of the Governing Board as the member's spouse or immediate family and who has had the same household of residence within the preceding four (4) years. If a small school district employs a substitute teacher in these circumstances, the member of the Governing Board who is related to the substitute teacher must recuse themselves from voting on any matter relating to substitute teachers.

==========

Adopted: _____

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LEGAL REF.:
A.R.S.
15-341
15-421
15-502
15-503
15-901
A.A.C.
R7-2-603
R7-2-614

CROSS REF.:
GCF – Hiring

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~~ARRANGEMENTS FOR SUBSTITUTE STAFF MEMBERS~~

~~The Superintendent will establish procedures for reporting the need for and arranging for professional staff substitutes.~~

~~Adopted: _____~~

~~LEGAL REF.:~~
~~A.A.C.~~
~~R7-2-614~~

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~~REGULATION~~

~~ARRANGEMENTS FOR SUBSTITUTE STAFF MEMBERS~~

~~When utilizing the leave policies of the District, it shall be the responsibility of the teacher to notify the supervising principal, as soon as possible, of the need for a substitute teacher. In the event the principal is not available, the _____ may be notified.~~

~~If the teacher knows in advance that a return to duty will be assured on a certain day, the principal should be so notified in order that the substitute may be informed.~~

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~~PROFESSIONAL / SUPPORT STAFF~~
ORIENTATION AND TRAINING

The Superintendent will establish a program to provide orientation for all new District employees. At a minimum, this program will cover the following items:

A. Goals, objectives, and programs of the District.

B. Personnel policies.

C. Sexual harassment.

D. Terms of employment.

E. General disciplinary rules and procedures.

F. Salary and ~~fringe~~ benefit plans.

G. Professional development ~~Self-improvement~~ opportunities.

H. The evaluation program and name(s) of evaluator(s).

I. Handling of body fluids.

J. Child abuse reporting responsibilities.

School districts and charter schools may not require an employee to engage in and shall not use public monies for training, orientation or therapy that presents any form of blame or judgment on the basis of race, ethnicity, or sex. This does not preclude any training on sexual harassment or lessons on recognizing and reporting abuse.

"Blame or judgment on the basis of race, ethnicity or sex" is defined in A.R.S. 41-1494 by seven (7) concepts.

Adopted: _____

LEGAL REF.:
A.R.S.
13-3620
15-153
15-341
41-1494
29 CFR 1910.1030

CROSS REF.:
IHAMD - Instruction and Training in Suicide Prevention

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~~PROFESSIONAL STAFF DEVELOPMENT~~

~~The Board recognizes its particular responsibility to provide opportunity for the continual professional growth of its certificated staff. Such opportunities include, within budgetary limitation, special in-service training courses, workshops, school or District visitations, conferences, professional library, and assistance from supervisors and consultants.~~

~~In line with such opportunities, the Board encourages educational research by staff members when the conduct of the project does not conflict with the major functions of the schools.~~

~~In-Service Training Courses~~

~~The Superintendent may establish local in-service training courses for teachers and other certificated employees in the schools, credit for which may be granted beyond the bachelor's degree in the manner that graduate courses in institutions of higher learning are taken into account.~~

~~This credit may be granted in cases where the scope, level, quality, and content of the local course is equal to college graduate work and the instructor is qualified to teach on the college level. The Superintendent may establish reasonable rules by which to select such courses and designate them for credit. The maximum number of credits earned in such courses that may be counted toward the salary differentials is one-half (1/2) the credits required for each column of the salary schedule. The number of credits to be granted for each course shall be determined by the Superintendent.~~

~~The attendance of teachers in these courses shall be recorded, and no credit shall be allowed unless the teacher has completed the assigned work of the course.~~

~~If the District compensates the staff member for attending in-service training courses, no credit shall be allowed for advancement on the salary schedule.~~

~~Adopted: _____~~

~~LEGAL REF.:~~
~~A.R.S.~~
~~15-342~~

~~CROSS REF.:~~
~~IHAMD - Instruction and Training in Suicide Prevention~~

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~~PROFESSIONAL STAFF PROBATIONARY AND CONTINUING STATUS~~

~~*Probationary teacher* means a certificated teacher who is not a continuing teacher.~~

~~*Continuing teacher* means:~~

> ~~A. a certificated teacher who has been and is currently employed by the District for the major portion of three (3) consecutive school years, and;~~
>
> ~~B. who has not been designated in the lowest performance classification for the previous school year or who has not regained continuing status after being designated as a probationary teacher.~~

~~A continuing teacher becomes a probationary teacher in the school year following having been designated in the lowest performance classification and shall remain a probationary teacher until that teacher's performance classification is designated in either of the two (2) highest performance classifications.~~

~~Administrators are not covered under the terms of the teacher appointment and evaluation statutes and do not gain credit toward continuing status.~~

~~Adopted: _____~~

~~LEGAL REF.:~~
~~A.R.S.~~
~~15-501~~
~~15-502~~
~~15-536~~
~~15-538.01~~
~~15-539~~
~~15-544~~
~~15-546~~
~~15-547~~
~~A.G.O.~~
~~I78-150~~
~~I78-286~~
~~I80-113~~
~~I83-131~~
~~I84-048~~

~~CROSS REF.:~~
~~GCO - Evaluation of Professional Staff Members~~

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~~PROFESSIONAL STAFF~~ ASSIGNMENTS AND TRANSFERS

~~The Superintendent shall have the responsibility for the assignment of all personnel throughout the District.~~ The procedure for assignment and transfer of ~~professional~~ staff members, as well as the resolution of any conflicts regarding transfers, will be based on employee qualifications, the needs of the instructional program, the needs of the students, and the overall needs of the District as defined by the Superintendent.

Assignments

The Superintendent shall have the responsibility for the assignment of all personnel throughout the District.

~~In addition, n~~No right to school, grade, or subject assignment shall be inferred from ~~the~~ a teacher's contract.

Transfers

Certificated Employees

The transfer of teachers from one school to another school within the District shall take into consideration the needs of the students in the District and the current distribution of teachers across all of the four (4) performance classifications as adopted by the State Board of Education.

A teacher who has been employed by the District for the major portion of three (3) or more consecutive school years and who is currently designated in the lowest performance classification for two (2) consecutive school years shall not be transferred as a teacher to another school in the District unless 1) the District has issued a preliminary notice of inadequacy of classroom performance, ~~and approved a performance improvement plan for the teacher and~~ 2) the performance plan has been approved, and 3) the Governing Board has approved the new placement as in the best interests of the ~~pupils~~ students in the school.

Following a transfer under this provision, a teacher who continues to be designated in one (1) of the two (2) lowest performance classifications shall not be permitted to transfer to another school. A teacher shall not be transferred more than once under the provisions of this paragraph.

Noncertificated Employees

The transfer/reassignment of noncertificated employees will be determined by the ~~of teachers from one school to another school within the District shall take into consideration the~~ needs of the ~~pupils in the~~ District and ~~the current distribution of teachers across all of the four (4) performance classifications as adopted by the State Board of Education~~ employee qualifications.

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Transfer Across Pay Grades

The above applies to transfers/reassignments within the same job classification and pay grade. Transfer/reassignment of an employee to a position of greater or lesser pay requires Board approval.

Voluntary Transfers

~~Professional~~ All staff members may apply for transfer or reassignment, whether or not a vacancy exists. Transfers will not be approved during the school year unless the needs of the District dictate such approval.

~~In the case of vacancies in new or existing positions, first consideration will be given to qualified applicants among current employees.~~

~~The resolution of any conflicts over the need for a transfer shall be based on what is best for the instructional program, the needs of the students, and the overall needs of the District as defined by the Superintendent.~~

Prohibited Transfer/Re-assignment Basis

An employer cannot transfer or reassign an employee due to the employee's good faith report required under A.R.S. 13-3620 or A.R.S. 15-514.

Adopted: _____

LEGAL REF.:
A.R.S.
13-3620
15-341
15-502
15-503
15-514
15-537 - 15-541

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~~PROFESSIONAL STAFF~~
~~SCHEDULES AND CALENDARS~~

~~All professional staff members shall report to their duty stations on time each workday and shall, as scheduled, be available there until the designated time(s) they are scheduled to leave. The Superintendent may alter or extend the school day for meetings, special events, and activities.~~

~~Professional staff members are expected to be in their respective rooms or work areas as the schedule prescribes so that they may see students, parents, and/or attend to other duties as assigned. Family members are not allowed in teacher work areas during scheduled duty hours.~~

~~In order to ensure the safety of students and the security of school campuses, teachers may be assigned supervisory duty during the teaching day. These duty assignments shall be considered a regular part of a teacher's duties and shall be fulfilled accordingly.~~

~~Teachers will perform duties other than classroom teaching. Extra duty assignments will be made by the Superintendent.~~

~~Adopted: _____~~

~~LEGAL REF.:~~
~~A.R.S.~~
~~15-341~~

~~CROSS REF.:~~
~~GCMF - Professional Staff Duties and Responsibilities~~
~~JLIA - Supervision of Students~~

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~~PROFESSIONAL STAFF MEETINGS~~

~~The Superintendent will arrange for and hold staff meetings as the need may arise. This authority may be delegated to the school principals, who may hold such building meetings on a regularly scheduled basis or as they may arise.~~

~~All teachers are required to attend any such meetings unless officially excused by the principal or the Superintendent prior to the meeting.~~

~~The Board and the administration recognize the value of and encourage grade-level staff meetings or departmental staff meetings. A minimum number of such meetings will be allowed during the regular school day, as long as the minimum number of classroom minutes for the grade level has been met. Arrangements for such meetings shall be made with the Superintendent through the school principals.~~

~~Adopted: _____~~

~~LEGAL REF.:~~
~~A.R.S.~~
~~15-341~~

~~CROSS REF.:~~
~~IKACA - Parent Conferences~~

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~~PROFESSIONAL STAFF~~ DUTIES AND RESPONSIBILITIES

(Duties of Teachers; Failure to Comply is Unprofessional Conduct; Penalty)

Certificated Employees

~~***Every teacher shall:***~~

~~A. Make student learning the primary focus of the teacher's professional time.~~

~~B. Hold students to strict account for disorderly conduct.~~

~~C. Exercise supervision over students on the playgrounds and during recess if assigned to such duty.~~

~~D. Take and maintain daily classroom attendance.~~

~~E. Make the decision to promote or retain a student in grade in a common school or to pass or fail a student in a course in high school. Such decisions may be overturned only as provided in A.R.S. 15-342.~~

~~F. Comply with all rules, regulations, and policies of the Governing Board that relate to the duties as prescribed.~~

~~A teacher shall not use sectarian or denominational books or teach any sectarian doctrines or conduct religious exercises.~~

~~A teacher who instructs a course offered under Policy IHAL, Teaching About Religion, in its appropriate historical context and in good faith shall be immune from civil liability and disciplinary action pursuant to section A.R.S. 15-535.~~

~~A teacher who fails to comply with the above is guilty of unprofessional conduct and may be subject to disciplinary action by the Governing Board and by the State Board of Education.~~

~~A teacher who is arrested for or charged with any nonappealable offense listed in section 41-1758.03, subsection B and who does not immediately report the arrest or charge to the teacher's supervisor is guilty of unprofessional conduct and shall be immediately dismissed from employment with the School District.~~

Schedules

Certificated employees are expected to be in their respective rooms or work areas as the schedule prescribes so that they may see students, parents, and/or attend to other duties as assigned. Family members are not allowed in teacher work areas during scheduled duty hours.

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In order to ensure the safety of students and the security of school campuses, teachers may be assigned supervisory duty during the teaching day. These duty assignments shall be considered a regular part of a teacher's duties and shall be fulfilled accordingly.

Teachers will perform duties other than classroom teaching. The Superintendent may alter or extend the school day for meetings, special events, and activities; extra duty assignments may be made by the Superintendent.

Arrangements for Substitute Teachers

The Superintendent will establish procedures for reporting the need for and arranging for substitutes.

Noncertificated Employees

Schedules

All noncertificated employees shall report to their duty stations on time each workday and shall, as scheduled, be available there until the designated time(s) they are scheduled to leave.

The normal workweek for noncertificated employees will not exceed forty (40) hours per week. Usually, the week will be based on eight (8) hours per day, five (5) days per week; however, the Superintendent may designate other workweek structures to meet varying conditions and needs of the District. Employees will be notified at least one (1) week in advance of any modification to the workweek plan.

Individual employee work schedules will be based on the position held by the respective employees and on District needs as identified during the employment process.

For the purpose of calculating regular and overtime hours in accordance with wage and hour requirements, the District's designated workweek shall begin at 12:01 a.m. Sunday and conclude at 12:00 midnight the following Saturday.

Overtime

A noncertificated employee may work overtime, provided that advance authorization is obtained from the supervisor in charge or, in the case of an emergency, authorization is obtained immediately upon completion of the work or as soon thereafter as practicable.

All Employees

Meetings

The Superintendent will arrange for and hold staff meetings as the need may arise. This authority may be delegated to the school principals or supervisors, who may hold such meetings on a regularly scheduled basis or as they may arise.

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All appropriate employees are required to attend any such meetings unless officially excused by the principal, supervisor or the Superintendent prior to the meeting.

Grade-level staff meetings or departmental staff meetings are allowed during the regular school day, as long as the minimum number of classroom minutes for the grade level has been met. Arrangements for such meetings shall be made with the Superintendent through the school principals.

Adopted: _____

LEGAL REF.:
A.R.S.
15-153
15-203
15-341
15-342
15-502
15-535
15-539
15-550
15-717.01
15-901
23-391
41-1758.03
A.A.C.
R7-2-614
Arizona Constitution, Article 18, Section 1
29 U.S.C. 207, Fair Labor Standards Act
29 C.F.R. 516 *et seq*., Fair Labor Standards Act

CROSS REF.:
GBEA - Ethics and Code of Conduct
~~GBEB - Staff Conduct~~
GCO - Evaluations ~~of Professional Staff Members~~ and Contracts
IKACA - Parent Conferences
JLIA - Supervision of Students

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REGULATION

DUTIES AND RESPONSIBILITIES

(Noncertificated Employee Workload)

Fair Labor Standards Act: Overtime Compensation

Per 29 U.S.C. 207(o), nonexempt employees who work more than forty (40) hours per week shall be awarded "compensatory time" at the rate of one and one-half (1 1/2) hours for each hour of overtime work, in lieu of overtime compensation, as stated in the employee's agreement or contract. Compensatory time ("comp time") accrual, use, and payout shall occur pursuant to 29 U.S.C. 207(o).

In cases of emergency, when the employee cannot be immediately released for comp time, the Superintendent will either pay the employee overtime compensation at the rate of time and one-half or have the employee use the comp time at a future date, consistent with law.

The hours must be approved by the immediate supervisor before an employee works overtime or, in the case of an emergency, immediately upon completion of the work or as soon thereafter as possible.

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REGULATION

DUTIES AND RESPONSIBILITIES

(Arrangements for Substitute Staff Members)

When utilizing the leave policies of the District, it shall be the responsibility of the teacher to notify the principal, as soon as possible, of the need for a substitute teacher. In the event the principal is not available, the principal's designee will be notified.

If the teacher knows in advance that a return to duty will be assured on a certain day, the principal should be so notified in order that the substitute may be informed.

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ADVISORY 1015

Note: This material is written for informational purposes only, and not as legal advice. You may wish to consult an attorney for further explanation.

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EVALUATIONS ~~OF PROFESSIONAL STAFF MEMBERS~~ AND CONTRACTS

~~The process and purpose of evaluation for certificated professional staff members is to result in improvement of the quality of instruction and the strengthening of the abilities of the professional staff.~~

Definitions ~~of Terms~~

In this policy:

A. ***Certificated teacher*** means a person who holds a certificate from the State Board of Education to work in the schools of this state and who is employed under contract in a position that requires certification, except a psychologist or an administrator devoting at least fifty percent (50%) of the person's time to classroom teaching.

B. ***Continuing teacher*** means a certificated teacher who has been and is currently employed by the School District for the major portion of three (3) consecutive school years and who has not been designated in the lowest performance classification for the previous school year or who has not regained continuing status after being designated as a probationary teacher.

C. ***Probationary teacher*** means a certificated teacher who is not a continuing teacher.

D. ~~B.~~ ***Inadequacy of classroom performance*** means the definition of inadequacy of classroom performance adopted by the Governing Board.

E. ~~C.~~ ***Performance classifications*** means the four (4) performance classifications for teachers and the principal~~s~~ performance evaluation system as adopted by the Governing Board.

F. ~~D.~~ ***Qualified evaluator*** means a school principal or other person who is trained to evaluate teachers and who is designated by the Governing Board to evaluate certificated teachers.

~~Evaluation of Classroom Teachers and Other Certificated Non-administrative Staff Members~~

A continuing teacher becomes a probationary teacher in the school year following having been designated in the lowest performance classification and shall remain a probationary teacher until that teacher's performance classification is designated in either of the two (2) highest performance classifications.

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Evaluations

The Governing Board shall adopt teacher evaluation policies pursuant to A.R.S. 15-537.

In developing the District's evaluation systems, the Governing Board may review and consider the Arizona Department of Education's teacher and principal evaluation system best practices.

Information regarding the evaluation process can be found in GCO-R.

Certificated Employees

The District teacher performance evaluation system shall do the following:

A. Be designed to improve teacher performance and improve student achievement;

B. Include quantitative data on the academic progress for all students, which shall account for between twenty percent (20%) and thirty-three percent (33%) of the evaluation outcomes;

C. Include four (4) performance classifications, designated as highly effective, effective, developing, and ineffective.

~~Performance classifications for teachers shall be the same four (4) performance classifications adopted by the State Board of Education. The performance classifications are to be applied to the evaluation instruments in a manner designed to improve principal and teacher performance. At least annually, the Governing Board will discuss at a public meeting its aggregate performance classifications of principals and teachers.~~

The District will involve its certificated teachers in the development and periodic evaluation of the teacher performance evaluation system. The ~~following elements will be a part of the~~ Governing Board shall ensure that its teacher evaluation system and policies describe teacher incentives, protections, performance improvement plans, and dismissal and nonrenewal procedures as required by A.R.S. 15-537, including:

A. *Incentives* for teachers in the highest performance classification, which may include multiyear contracts not to exceed three (3) years. The offer and acceptance of a multiyear contract does not exclude that teacher from the application of A.R.S. 15-538.01, 15-540, 15-541, or 15-549, and the teacher may accept a multiyear contract offer or decline and accept a one (1) year contract.

B. *Incentives* for teachers in the two (2) highest performance classifications to work at schools that are assigned a letter grade of D or F pursuant to A.R.S. 15-241.

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C. *Protections* for teachers who are transferred to schools that are assigned a letter grade of *D* or *F* pursuant to A.R.S. 15-241.

D. *Protections* for teachers if the principal of the school is designated in the lowest performance classification.

E. *Performance improvement plans* for teachers designated in the lowest performance classification.

F. *Dismissal or nonrenewal procedures* pursuant to A.R.S. 15-536 or 15-539 for teachers who continue to be designated in the lowest performance classification. The procedures shall require that the School District issue the preliminary notice of inadequacy of classroom performance no later than the second consecutive year that the teacher is designated in one (1) of the two (2) lowest performance classifications unless the teacher is in the first or second year of employment with the School District or has been reassigned to teach a new subject or grade level for the preceding or current school year.

The Governing Board shall also ensure that its teacher evaluation system includes procedures as prescribed by 15-537(F), (G), (H), (I) & (J).

~~A. It will meet the requirements prescribed in statute and provide at least one (1) evaluation of each certificated teacher by a qualified evaluator each school year or as provided in Section I.~~

~~B. A copy of the evaluation system shall be given to each teacher in the District.~~

~~C. Specific training requirements for qualified evaluators, approved by the Board, will be included which may involve local or national educator training resources recommended by the Superintendent.~~

~~D. The Superintendent will recommend qualified evaluators to the Board prior to naming evaluators.~~

~~E. The Board will designate qualified evaluators.~~

~~F. Best practices for professional development and evaluator training adopted by the State Board of Education will be considered.~~

~~G. The system will include incentives for teachers in the highest performance classification.~~

~~H. The system will include a plan for the appropriate use of quantitative data of student academic progress in evaluations of all certificated teachers. The plan may make distinctions between certificated teachers who provide direct instruction to students and certificated teachers who do not provide direct instruction to students. The plan may include data for multiple school years and may limit the use of data for certificated teachers who have taught for less than two (2) complete school years.~~

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~~I. The District may use an alternative performance evaluation cycle subject to the following:~~

~~1. The Governing Board shall adopt policies for an expedited performance review during the years in which a teacher is not undergoing a formal performance evaluation. The expedited performance review policies may classify teacher performance in categories that include teamwork and support for lower-performing teachers.~~

~~2. The Governing Board shall allow only teachers who have been evaluated and designated in the highest performance classification for at least three (3) consecutive years by the same school to participate in the alternative performance evaluation cycle.~~

~~3. If an expedited performance review under this subsection determines that the teacher is not in the highest performance classification, the teacher shall be removed from the alternative performance evaluation cycle and be reviewed on the established evaluation system.~~

~~The Governing Board may waive the requirement of a second classroom observation for a continuing teacher whose teaching performance based on the first classroom observation places the teacher in one (1) of the two (2) highest performance classifications for the current school year, unless the teacher requests a second observation.~~

~~Either the qualified evaluator or another Board designee shall confer with the teacher to make specific recommendations as to the areas of improvement in the teacher's performance and to provide professional development opportunities for the certificated teacher to improve performance and follow up with the teacher after a reasonable period of time for the purpose of ascertaining that the teacher is demonstrating adequate performance.~~

==========

The District teacher evaluation will address the following ~~items~~ (*to be inserted in this location BEFORE adoption by the Board*):

~~**Item 1**~~

<u>In this policy the Board shall describe:</u>

<u>1)</u> ~~The Board shall *describe*~~ *performance improvement plans.* ~~for teachers designated in the lowest performance classification *and*~~

<u>2)</u> *dismissal or nonrenewal procedures* pursuant to ~~section~~ <u>A.R.S.</u> 15-536 or 15-539 for teachers who continue to be designated in the lowest performance classification.

<u>3)</u> *Inadequacy of Classroom Performance.*

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~~**Item 2**~~

~~**The Board's dismissal or nonrenewal procedures shall require that the District issue the preliminary notice of inadequacy of classroom performance no later than the second consecutive year that the teacher is designated in one (1) of the two (2) lowest performance classifications unless the teacher is in the first or second year of employment with the District or has been reassigned to teach a new subject or grade level for the preceding or current school year.**~~

~~A teacher's classroom performance is inadequate if:~~

~~***INSERT DISTRICT LANGUAGE HERE.***~~

~~==========~~

~~The Superintendent is authorized to issue preliminary notices of inadequacy of classroom performance prior to Governing Board approval. The Superintendent, in consultation with the principal or supervisor of the classroom teacher, will consider any mitigating circumstances before issuing such notices to a classroom teacher who is new to the profession or who was recently reassigned to a new grade level or content area. The Board will be notified within ten (10) school days of such issuance.~~

~~A teacher whose evaluation is used as a criterion for establishing compensation and who disagrees with the evaluation may make a written appeal. The teacher shall have the burden of proof in the appeal. The appeal shall go to the Superintendent.~~

~~**Evaluation of** ***Principals,***~~
other Administrators
and Psychologists

The Board authorizes the Superintendent to establish a system for the evaluation of principals, other administrators, and certificated school psychologists. Advice will be sought from those to be evaluated in the development of the performance evaluation system for each of these employee classifications.

~~**Evaluation of** ***Principals***~~

The Governing Board shall adopt policies that:

A. are designed to improve principal performance and improve student achievement.

B. include the use of quantitative data on the academic progress for all students, which shall account for between twenty percent (20%) and thirty-three percent (33%) of the evaluation outcomes.

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C. include four (4) performance classifications, designated as highly effective, effective, developing and ineffective.

D. describe both of the following:

1. the methods used to evaluate the performance of principals, including the data used to measure student performance and job effectiveness.

2. the formula used to determine evaluation outcomes.

The evaluation system for the evaluation of the performance of principals may include the overall instructional program, student progress, personnel, curriculum, and facilities. Principals will be given a review of evaluation procedures prior to beginning the process.

Subject to statutory limitations, the Board shall make available the evaluation and performance classification pursuant to A.R.S. 15-50~~37~~ of each principal in the District to school districts and charter schools that are inquiring about the performance of the principal for hiring purposes.

~~Evaluation of~~ *Other Administrators*

The format for the evaluation system for other administrators (other than the Superintendent) will be developed under the leadership of the Superintendent, focusing on the responsibilities and outcomes which support the overall instructional program and needs of the District. Evaluation procedures, timelines, and methods to be used for the communication of evaluation results will be reviewed with each employee prior to beginning the process.

~~Evaluation of~~ *Certificated School Psychologists*

The evaluation system for certificated school psychologists shall include the following:

A. Recommendations as to areas of improvement in the performance of the certificated school psychologist if the performance warrants improvement.

B. After transmittal of an assessment, a Board designee shall confer with the certificated school psychologist to make specific recommendations as to areas of improvement in performance.

C. The Board designee shall provide assistance and opportunities for the certificated school psychologist to improve his/her performance and shall follow up after a reasonable period of time for the purpose of ascertaining that adequate performance is being demonstrated.

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D. Appeal procedures for certificated school psychologists who disagree with the evaluation of their performance, if the evaluation is for use as criteria for establishing compensation or dismissal.

~~Contracts of~~ Noncertificated Employees

A. All noncertificated personnel shall be evaluated by the designated supervisor or administrator.

B. A written evaluation of each employee's effectiveness shall be completed during the first year of employment, no later than ninety (90) days after the employee's start date.

C. A second evaluation shall be conducted within the first year, on or before the employee's anniversary date.

D. Each noncertificated employee shall be evaluated at least once annually thereafter.

E. Evaluations shall be used to support the improvement of job performance and to inform decisions regarding continued employment.

Contracts

Certificated Employees

The Governing Board may transmit and receive contracts of certificated employees in an electronic format and may accept electronic signatures on those contracts. The Superintendent will develop procedures for the implementation of this discretionary process.

The Governing Board may adopt requirements that require electronic signatures to be followed by original signatures within a specified time period.

Adopted: _____

LEGAL REF.:
A.R.S.
15-153
15-189.06
15-203
15-241
15-341
15-501
15-502
15-503
15-512
15-536

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15-537
15-537.01
15-538
15-538.01
15-539 *et seq*.
15-544
15-549
15-918.02
15-977
15-1326
A.A.C.
R7-2-605

CROSS REF.:
GBEA - Ethics and Code of Conduct
~~GBEB - Staff Conduct~~
GCB - ~~Professional Staff Contracts and~~ Compensation
GCF - ~~Professional Staff~~ Hiring
~~GCJ - Professional Staff Noncontinuing and Continuing Status~~
GCK - ~~Professional Staff~~ Assignments and Transfers
GCMF - ~~Professional Staff~~ Duties and Responsibilities
GCQF - Discipline, Suspension, and Dismissal ~~of Professional Staff Members~~
~~GDO - Evaluation of Support Staff Members~~

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REGULATION

EVALUATIONS ~~OF PROFESSIONAL STAFF MEMBERS~~ AND CONTRACTS

~~**(Certificated Employees)**~~

~~**Evaluators**~~

~~The Superintendent will compile an updated listing of those who have successfully completed the District required evaluator training and submit this list of newly trained evaluators prior to the first scheduled staff observation by an evaluator to the Governing Board for designation as qualified evaluators. The evaluator shall be responsible for the final written and official statement of evaluation, which shall be in writing, and a copy shall be transmitted to the certificated teacher within five (5) days after completion of the evaluation. [A.R.S. 15-537]~~

Performance Classifications

Teachers shall be evaluated using the four (4) performance classifications: Highly Effective, Effective, Developing, and Ineffective. The teacher performance evaluation system shall be designed to improve teacher performance and improve student achievement. The instrument shall include the use of quantitative data on the academic progress for all students, and that data shall account for between twenty (20) percent and thirty-three (33) percent of the evaluation outcomes. The objectives of the evaluation system are to improve instruction and maintain instructional strengths.

~~The Superintendent shall implement the specific training requirements for qualified evaluators prescribed by the Governing Board.~~

~~Best practices for professional development and evaluator training adopted by the State Board of Education should be referenced by the Superintendent periodically as the State Board has the authority to periodically make adjustments to align with the model framework for teacher and principal evaluations with assessment data changes at the state level.~~

~~***Classroom Observations by Evaluator:***~~

> ~~A. The teacher performance evaluation system shall include at least two (2) actual classroom observations of the certificated teacher demonstrating teaching skills in a complete and uninterrupted lesson by the qualified evaluator. However, the Governing Board may waive the requirement of a second classroom observation for a continuing teacher whose teaching performance based on the first classroom observation places the teacher in one (1) of the two (2) highest performance classifications for the current school year, unless the teacher requests a second observation.~~

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~~B. There shall be at least sixty (60) calendar days between the first and last observations.~~

~~C. Preliminary notice of inadequacy may follow the first observation.~~

~~D. The last observation may follow the issuance of a preliminary notice of inadequacy of classroom performance, the completion of any performance improvement plan and be used to determine whether the teacher has corrected inadequacies and has demonstrated adequate classroom performance.~~

~~E. An observation shall not be conducted within two (2) instructional days of any scheduled period in which school is not in session for one (1) week or more.~~

~~F. Informal or additional formal observations may be made at the discretion of the administrator. Observations that do not constitute a complete and uninterrupted lesson shall not be considered in determining performance ratings and may only be used to provide feedback to improve instructional performance.~~

~~Procedural Steps in the Process of Evaluation:~~

~~A. The evaluation procedures shall be reviewed at each school. At the beginning of the school year, the principal shall meet with the school's faculty for the purpose of orienting the teachers to the total evaluation plan. Any teacher that is hired after the school year begins must also be given a review of evaluation procedures prior to the teacher's evaluation.~~

~~B. Within ten (10) business days after each observation, the qualified evaluator observing the teacher shall provide written feedback to the teacher and a copy shall be retained for the principal's file. A third copy shall be placed in the teacher's personnel file and made available to authorized District officers and employees and as otherwise provided by law.~~

~~C. The results of an annual evaluation shall be in writing, or provided in electronic format to the certificated teacher and a copy shall be transmitted or provided in an electronic format to the certificated teacher within five (5) business days after completion of the evaluation.~~

~~D. Either the qualified evaluator or another Board designee shall confer with the teacher to make specific recommendations as to the areas of improvement in the teacher's performance and to provide professional development opportunities for the certificated teacher to improve performance and follow up with the teacher after a reasonable period of time for the purpose of ascertaining that the teacher is demonstrating adequate performance.~~

~~E. The certificated teacher may initiate a written reaction or response to the evaluation. The official evaluation shall be reduced to writing and signed by both the teacher and the evaluator. The teacher's signature shall not mean~~

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~~concurrence. The teacher shall be allowed ten (10) calendar days to write and submit any comments, which shall be attached to the evaluation.~~

~~F. Copies of the evaluation report and performance classification of a certificated teacher retained by the Governing Board and the Department of Education are confidential, do not constitute a public record and shall not be released to any person except to those stipulated in A.R.S. 15-537 which allows release to certain prescribed parties, including school districts and charter schools that inquire about the performance of the teacher for prospective employment purposes.~~

~~G. A school district or charter school that receives information about a certificated teacher from the evaluation report and performance classification shall use this information solely for employment purposes and shall not release to or allow access to this information by any other person, entity, school district or charter school for employment purposes.~~

In accordance with A.R.S. 15-537, the Governing Board shall adopt teacher evaluation policies in a public meeting, following opportunities for public discussion.

Teacher Participation

The Governing Board shall involve certificated teachers in the development and periodic evaluation of the teacher performance evaluation system.

Evaluation Process

Certificated Teachers

The District's teacher evaluation system shall:

A. Provide at least one (1) annual evaluation of each certificated teacher by a qualified evaluator, unless the teacher is participating in an alternative cycle as provided in A.R.S. 15-537(B).

B. Incorporate quantitative data on the academic progress of all students, accounting for between twenty (20) percent and thirty-three (33) percent of evaluation outcomes. The District shall implement a plan for the appropriate use of quantitative data of student academic progress in evaluations of all certificated teachers. The plan may make distinctions between certificated teachers who provide direct instruction to students and certificated teachers who do not provide direct instruction to students. The plan may include data for multiple school years and may limit the use of data for certificated teachers who have taught for less than two (2) complete years.

C. Include at least two (2) actual classroom observations of a complete and uninterrupted lesson by a qualified evaluator, with at least sixty (60) calendar days between the first and last observations.

1. The last observation may follow the issuance of a preliminary notice of inadequacy of classroom performance and be used to determine

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whether the teacher has corrected inadequacies and has demonstrated adequate classroom performance.

2. An observation shall not be conducted within two (2) instructional days of any scheduled period in which school is not in session for one (1) week or more.

3. Each evaluation shall include recommendations as to areas of improvement in the performance of a certificated teacher if performance warrants improvement. After transmittal of an evaluation, the qualified evaluator or other Board designee shall confer with the teacher to make specific recommendations as to areas of improvement in the teacher's performance. The qualified evaluator or other Board designee shall provide professional development opportunities for the certificated teacher to improve performance and follow up after a reasonable period of time for the purpose of ascertaining that the teacher is demonstrating adequate performance.

4. The requirement of a second classroom observation may be waived for a continuing teacher whose teaching performance based on the first classroom observation places the teacher in one (1) of the two (2) highest performance classifications for the current school year, unless the teacher requests a second observation.

D. Require that written feedback be provided to the teacher within ten (10) business days after each observation.

E. Require that the results of an annual evaluation be in writing or electronic format and a copy provided to the teacher within five (5) days after completion.

F. Permit the teacher to submit a written reaction or response to the evaluation.

G. Maintain the confidentiality of evaluation reports and performance classifications, releasing them only as authorized by law. Copies of the evaluation report and performance classifications of a certificated teacher retained by the Governing Board and the Department of Education are confidential, do not constitute a public record and shall not be released or shown to any person except: 1) to the certificated teacher; 2) to authorized District officers and employees for personnel matters; 3) to school districts and charter schools that inquire about the performance of the teacher for prospective employment purposes (and any district or charter school receiving the information shall use it solely for employment purposes and shall not release it or allow access to it by any other person or entity); and 4) for introduction in evidence or discovery in a court action as provided by law.

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H. If the evaluation is used as criteria for establishing compensation, permit the teacher to appeal the evaluation pursuant to appeal procedures adopted by the Governing Board.

I. Include specific and reasonable plans for the improvement of teacher performance.

J. Include training requirements for qualified evaluators, as prescribed by the Governing Board.

The District may permit an alternative performance evaluation cycle subject to the following:

A. Expedited reviews shall be conducted in years when a formal evaluation is not required and may include factors such as teamwork and support for lower-performing teachers.

B. Teacher performance may be classified in categories that include teamwork and support for lower-performing teachers.

C. Only teachers who have been evaluated and designated in the highest performance classification for at least three (3) consecutive years by the same school district may participate.

D. A teacher who does not maintain the highest performance classification shall return to the regular evaluation cycle.

Preliminary Notice of Inadequacy ~~***of Classroom Performance***~~*:*

A. A teacher whose ~~classroom~~ performance ~~has been evaluated as being~~ is found inadequate shall be ~~given~~ issued a preliminary notice of inadequacy of classroom performance if ~~the teacher may be~~ dismiss~~ed~~al or non-renew~~ed~~al ~~because of this notice~~ is being considered. The notice ~~will provide the teacher at least forty-five (45) instructional days in which to overcome the inadequacies and~~ shall specify the deficiencies and provide at least forty-five (45) instructional days to correct them ~~nature of the inadequacy with such particularity as to furnish the teacher an opportunity to correct the inadequacies and maintain adequate classroom performance as defined by the Governing Board~~.

B. ~~The Superintendent is authorized to issue preliminary notice of inadequacy of classroom performance without prior Board approval. The Superintendent will notify the Board of such issuance~~ A preliminary notice may be issued by the Superintendent or another authorized employee of the Governing Board, and its issuance shall be reported to the Governing Board within ten (10) school days ~~of such issuance~~.

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C. ~~The preliminary~~ Each notice ~~of inadequacy of classroom performance~~ shall be accompanied by a performance improvement plan ~~designed to help the teacher correct inadequacies and demonstrate adequate classroom performance~~.

D. The Governing Board shall adopt a definition of inadequacy of classroom performance aligned with the performance classifications.

Nonrenewal/Dismissal ~~***of Certificated Employees***~~*:*

A. The Governing Board shall ~~authorize, as necessary, and send notice to teachers who will not be reemployed for the ensuing school year~~ issue notices of dismissal or nonrenewal as required by law.

B. ~~The written n~~Notices ~~of intention to dismiss or not to reemploy~~ shall include a copy of ~~any valid~~ relevant evaluations ~~pertinent to the charges made~~ and state the reasons for dismissal or nonrenewal.

C. Notices ~~of the Board's intention not to reemploy the teacher~~ shall be ~~made by~~ deliver~~ing~~ed ~~it~~ personally ~~to the teacher or by sending it~~ or sent by registered or certified mail to the ~~teacher at the~~ teacher's ~~place of residence, as recorded in the District's~~ address of record~~s~~. ~~The notice shall incorporate a statement of reasons for not reemploying the teacher.~~

D. No notice of dismissal or nonrenewal based on ~~If a teacher does not correct~~ inadequacy~~ies~~ ~~and demonstrate adequate classroom performance following the preliminary notice of inadequacy of classroom performance accompanied by a~~ shall be issued until the statutory observation and performance plan ~~and the statutory time allocated for such improvement has elapsed, a written notice of intention to dismiss or not to reemploy may be issued~~ process has been completed.

~~E. The Governing Board shall give any certificated teacher notice of intention to dismiss or not to reemploy if such intention is based on charges of inadequacy of classroom performance. The Governing Board or its authorized representative at least forty-five (45) instructional days before such notice, shall give the teacher written preliminary notice of inadequacy of classroom performance, specifying the nature thereof with such particularity as to furnish the teacher an opportunity to correct inadequacies and maintain adequate classroom performance. A notice of the Governing Board's intention to dismiss or not to reemploy for inadequacy of classroom performance shall not be issued until the District has completed an observation at the conclusion of a performance improvement plan.~~

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~~F. In the case of a continuing teacher, if the teacher does not demonstrate adequate classroom performance within the allotted time the Board shall dismiss the teacher as provided by statute.~~

Contracts ~~***of Certificated Employees***~~*:*

A. The Governing Board shall offer ~~a teaching~~ contracts ~~for the next ensuing school year~~ to ~~each~~ certificated ~~probationary~~ teachers as provided in statute, except where proper notice of dismissal or nonrenewal has been given ~~who is under a contract of employment with the District for the current school year, unless the Governing Board, a member of the Board acting on behalf of the Board or the Superintendent gives notice to the teacher of the Board's intention not to offer a teaching contract or unless such teacher has been dismissed~~.

~~The Governing Board shall offer to each certificated continuing teacher who has been employed more than the major portion of three (3) consecutive years and who is under contract of employment with the District for the current year a contract renewal for the next ensuing school year unless the teacher has been given notice of the Board's intent not to offer a contract and to dismiss the teacher as provided by statute.~~

~~The Governing Board shall offer a contract to each certificated teacher who is not designated in the lowest performance classification and was offered a contract in the prior year unless the teacher has been given notice of the Board's intent not to offer a contract and to dismiss the teacher.~~

B. ~~The t~~Teachers must accept~~ance of the~~ contracts ~~must be indicated~~ within fifteen (15) business days ~~from the date of the teacher's~~ after receipt, ~~of the written contract~~ or the offer ~~of a contract~~ is revoked. Receipt is ~~considered~~ deemed to ~~have~~ occur~~red~~ when the ~~written~~ contract is ~~A.~~ personally delivered, ~~B.~~ placed in the ~~teacher's~~ school-provided mailbox~~,~~ (including e-~~lectronic~~ mail), or ~~C.~~ two (2) days after being placed in ~~a~~ the U.~~nited~~ S.~~tates Postal Service~~ mail ~~box~~. ~~The teacher a~~Acceptance~~s~~ occurs ~~the contract~~ by signing and returning the contract ~~and returning it to the Governing Board~~ or by ~~making a written instrument which accepts the terms of the contract and~~ delivering ~~it to the Governing Board. If the~~ a written instrument accepting ~~includes terms in addition to the~~ its terms ~~of the contract offered by the Board, the teacher fails to accept the contract~~.

C. A continuing teacher designated in the lowest performance classification for the current school year shall become a probationary teacher for the subsequent school year and shall remain probationary until designated in one (1) of the top two (2) performance classifications.

~~The Governing Board may transmit and receive contracts of certificated employees in an electronic format and may accept electronic signatures on those contracts. Additional provisions are as follows:~~

~~A. If a contract has not been transmitted to the certificated employee by the end of the current school year, an electronic contract to that certificated employee, if provided in that format by the District, shall be transmitted prior~~

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~~to the start of the next school year and shall be submitted to both the certificated employee's District e-mail as well as the certificated employee's personal e-mail in order to notify the certificated employee of the offer of contract.~~

~~B. Each certificated employee shall be responsible for submitting his or her personal e-mail to human resources personnel at the District for this purpose.~~

~~C. Documents transmitted in an electronic format pursuant to this subsection shall be considered written documents for the purposes of sections 15-536 and 15-538.01.~~

~~D. If the Governing Board has so adopted, electronic signatures are to be followed by original signatures within a specified time period.~~

~~E. The Governing Board that accepts an electronic signature for a certificated employee's contract shall provide validation to the certificated employee that the contract has been transmitted.~~

~~Principals, Other Administrators and Certificated School Psychologists:~~

~~A. Evaluation will be a cooperative procedure, with the evaluator and the evaluatee having full knowledge of the criteria and process.~~

~~B. The results of an annual evaluation shall be in writing, or be provided in electronic format, to the evaluatee and a copy shall be transmitted or provided in an electronic format within five (5) business days after completion of the evaluation.~~

~~C. Evaluation documents and procedures shall be developed based on the unique responsibilities and expectations inherent in the assignment.~~

~~D. The evaluation and performance classification of each principal in the District will be made available to school districts and charter schools that are inquiring about the performance of the principal for hiring purposes.~~

Principal<u>s</u>, ~~Other~~ Administrator<u>s</u>, and ~~Certificated School~~ Psychologist<u>s</u>:
~~Contract Renewal~~

<u>A. The evaluation system for certificated school psychologists shall include all components required by A.R.S. 15-503.</u>

~~If the administrator's contract with the District is for more than one (1) year, but not exceeding three (3) years,~~

<u>B.</u> ~~o~~<u>O</u>n or before May 15 ~~of the last year of the contract~~, the <u>Governing</u> Board shall offer a contract for the next school year to ~~the administrator~~ <u>each certified administrator and certificated school psychologist who is in the last year of</u>

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their contract, unless notice of nonrenewal is given on or before April 15 ~~the Board gives notice to the administrator of the Board's intention not to offer a new administrative contract~~.

C. ~~If the administrator's or psychologist's contract with the District is for a single year, on or before May 15 of each year the Board shall offer a contract for the next school year to the administrator or psychologist unless on or before April 15 the Board gives n~~Notice of nonrenewal shall be delivered personally or sent by certified mail, postmarked on or before the statutory deadline ~~to the administrator or psychologist of the Board's intention not to offer a new administrative contract or psychologist's contract~~.

D. The administrator's or certificated school psychologist's acceptance of the contract shall be indicated within thirty (30) days after the date of the written contract or the offer is revoked. The administrator or certificated school psychologist accepts the contract by signing and returning the contract to the Governing Board or by making a written instrument that accepts the terms of the contract and delivering it to the Governing Board.

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~~REGULATION~~

~~**EVALUATION OF PROFESSIONAL STAFF MEMBERS**~~

~~**(Procedures for Appeal of Evaluation)**~~

~~When an evaluation is used as the criterion for establishing a teacher's compensation, the teacher will be so informed at the conference where the evaluation is discussed.~~

~~A teacher whose evaluation is used as a criterion for establishing compensation and who disagrees with the evaluation may make a written appeal to the Superintendent no later than ten (10) days after the conference where the disputed evaluation is discussed.~~

~~The appeal to the Superintendent shall be limited to the sole issue of how the evaluation procedure used is at variance from the Board-adopted procedure. The burden of proof is on the teacher and the appeal may consist of a paper review. The decision of the Superintendent shall be final and not subject to further appeal or review.~~

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EXHIBIT

EVALUATIONS AND CONTRACTS

NONCERTIFICATED STAFF

Rating Scale Definitions

Highly Proficient – Consistently exceeds job expectations; demonstrates initiative and produces work of superior quality.

Proficient – Fully meets job expectations; dependable performance and satisfactory results.

Progressing – Inconsistently meets job expectations; improvement is needed to ensure consistent performance.

Ineffectual – Does not meet job expectations; performance is inadequate and requires immediate improvement.

Performance Report

Employee: _____

Department/Position: _____

Supervisor: _____

Date of Evaluation: _____

Evaluation Categories

Category	Highly Proficient	Proficient	Progressing	Ineffectual
1. Quality of Work – Accuracy, completeness, and thoroughness of job performance.	☐	☐	☐	☐
2. Quantity of Work – Volume of work performed in relation to expectations.	☐	☐	☐	☐

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3. Job Knowledge and Skills – Understanding of duties, methods, materials, and ability to apply them effectively.	☐	☐	☐	☐
4. Adaptability and Problem-Solving – Ability to adjust to change, handle new assignments, and respond to challenges.	☐	☐	☐	☐
5. Work Habits and Organization – Efficiency, use of time, organization of tasks, and compliance with procedures.	☐	☐	☐	☐
6. Teamwork and Collaboration – Ability to work cooperatively with students, staff, and supervisors.	☐	☐	☐	☐
7. Dependability and Attendance – Reliability in completing assignments, punctuality, and consistent attendance.	☐	☐	☐	☐
8. Attitude and Professionalism – Demonstrates a positive approach, ethical conduct, and willingness to support the organization.	☐	☐	☐	☐
9. Communication – Effectiveness in oral, written, and interpersonal communication.	☐	☐	☐	☐
10. Judgment and Decision-Making – Ability to make sound, practical decisions appropriate to the job.	☐	☐	☐	☐
Overall Rating (should reflect above ratings)	☐	☐	☐	☐

Comments:

1. Strengths (explain any "Highly Proficient " ratings):

_____

_____

_____

2. Areas for Growth (explain any "Progressing" or "Ineffectual" ratings):

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_____

_____

_____

3. General comments:

_____

_____

_____

Signatures indicate discussion of the Performance Report.

Employee's signature _____ Date _____

Evaluator's signature _____ Date _____

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ADVISORY 1016

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~~PROFESSIONAL STAFF PROMOTIONS~~

~~The Superintendent will fill positions of increased responsibility with the best available candidates. Candidates will be considered both from within and from outside the District.~~

~~Adopted: _____~~

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ADVISORY 1017

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~~PROFESSIONAL STAFF~~
REDUCTION IN FORCE

Certificated Employees

The number and type of certificated staff positions required to implement the District's educational program will be determined by the Board after recommendation from the Superintendent. In the event the Board decides to release certificated ~~staff members~~ employees, the following guidelines will be in effect:

The Superintendent shall submit to the Board recommendations for the termination of specific staff members. The criteria used in formulating these recommendations shall include, but shall not be limited to:

1. Qualifications and certification of staff members to accomplish the District's educational program, including certification requirements for specialty categories and designation as a highly qualified teacher.

2. Overall teaching experience, academic training, and ability.

3. Past contributions to the educational program of the District.

Teacher tenure and seniority shall not be considerations in retention determinations.

Noncertificated Employees

In the event the Board decides to release noncertificated employees, the following guidelines will be in effect:

A. Normal attrition due to terminations will be relied upon as the first means of reducing staff.

B. If attrition does not accomplish the required reduction in staff, the Superintendent shall submit to the Board recommendations for the termination of specific employees. The criteria used in formulating these recommendations shall include, but shall not be limited to:

1. Qualifications of staff members to accomplish the District's program.

2. Overall experience, training, and ability.

3. Past contributions to the program of the District.

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4. All other factors being equal, length of service in the District.

Criteria for selection of staff members to be released will be applied separately to employees within specialty categories.

Personnel to be released shall be notified as soon as practical.

Adopted: _____

LEGAL REF.:
A.R.S.
15-341
15-502
15-503
15-544
A.G.O.
I78-286

CROSS REF.:
GCB - ~~Professional Staff Contracts and~~ Compensation

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ADVISORY 1018

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RESIGNATION ~~OF PROFESSIONAL STAFF MEMBERS~~

Certificated Employees

All resignations or requests to be released from contract shall be presented in writing to the Board for approval. A release from an uncompleted contract may be granted contingent upon the availability of a well-qualified, certificated teacher as a replacement.

A teacher who resigns contrary to this policy shall be deemed to have committed an unprofessional act and shall be subject to the penalty as provided under Arizona statutes and State Board of Education regulations.

Noncertificated Employees

Employees voluntarily terminating their service with the District are expected to give advance notice of not less than ten (10) business days. This notice should be submitted to the supervisor in writing and should specify both the last day of work and the reason for termination.

Adopted: _____

LEGAL REF.:
A.R.S.
15-545
23-352
23-353
A.A.C.
R7-2-205

CROSS REF.:
GCMF - Duties and Responsibilities

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~~RETIREMENT OF PROFESSIONAL / SUPPORT STAFF MEMBERS~~

~~Retirement Incentive Program~~

~~The retirement incentive program is intended to provide a school employee with the opportunity to receive an incremental increase in salary during the final year of employment in exchange for the voluntary release, by the employee, of tenure rights or employee benefit rights accrued during such employment. Such payment must be offered and accepted in the employment contract prior to the beginning of the particular school year in which the retirement incentive pay is to be received.~~

~~The employee must apply to the Governing Board, in writing, for the retirement incentive during or before the year prior to the year in which retirement will occur. This application for the retirement incentive may be withdrawn on or before February 1 of the year of retirement.~~

~~An employee choosing the retirement incentive shall receive an increase over the regular contractual or scheduled salary in the year before retirement. All legally required deductions, including the employee's contribution to the state retirement fund, will be withheld. The payment shall be calculated as set forth below.~~

~~The payment will be based upon the number of years of service to the District.~~

~~Number of years of service to the School District~~	~~Percent of annual salary~~	~~Number of years of service to the School District~~	~~Percent of annual salary~~
~~10~~	~~2%~~	~~16~~	~~8%~~
~~11~~	~~3%~~	~~17~~	~~9%~~
~~12~~	~~4%~~	~~18~~	~~10%~~
~~13~~	~~5%~~	~~19~~	~~11%~~
~~14~~	~~6%~~	~~20 and above~~	~~12%~~
~~15~~	~~7%~~		

~~Sick Leave Payment upon Retirement~~

~~Upon proper and timely application for the retirement incentive program, the District will pay for accumulated sick leave on a graduated scale up to the maximum accumulated amount indicated by the District. Certificated employees will be paid based upon a daily rate established for payment of a day-to-day substitute teacher in the District, and support staff members will be paid based upon a daily rate calculated by multiplying the minimum wage times eight (8) hours. The payment will be made on the following scale:~~

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~~Number of years of service to the School District~~	~~Percent of daily rate~~	~~Number of years of service to the School District~~	~~Percent of daily rate~~
~~10~~	~~0%~~	~~16~~	~~30%~~
~~11~~	~~5%~~	~~17~~	~~35%~~
~~12~~	~~10%~~	~~18~~	~~40%~~
~~13~~	~~15%~~	~~19~~	~~45%~~
~~14~~	~~20%~~	~~20 and above~~	~~50%~~
~~15~~	~~25%~~		

~~No continuing rights are established by this policy. In compliance with established procedure, the Governing Board reserves the right to modify or rescind any policy in accord with its own guidelines.~~

~~Adopted: _____~~

~~LEGAL REF.:~~
~~A.R.S.~~
~~38-711 *et seq.*~~
~~38-741 *et seq.*~~

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ADVISORY 1020

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DISCIPLINE, SUSPENSION, AND DISMISSAL ~~OF PROFESSIONAL STAFF MEMBERS~~

An employee may be disciplined for unprofessional or immoral conduct, violations of policy, violation of the District's Ethics and Code of Conduct, and/or violations of the following expected standards of professional conduct. Consequences for misconduct may include disciplinary and/or non-disciplinary action.

Conduct

All Employees

Unprofessional Conduct

Any District employee or applicant for District employment who is arrested for or charged with any nonappealable offense listed in A.R.S. 41-1758.03, subsection B and who does not immediately report the arrest or charge to their supervisor is guilty of unprofessional conduct and shall be immediately dismissed from employment with the School District.

Required Conduct

In addition to the conduct required under the District's Ethics and Code of Conduct, employees shall:

A. Make reasonable efforts to protect students from conditions harmful to learning, health, or safety;

B. Account for all funds collected from students, parents, or school personnel;

C. Adhere to provisions of the Uniform System of Financial Records related to use of school property, resources, or equipment; and

D. Abide by copyright restrictions, security, or administration procedures for a test or assessment.

Prohibited Conduct

In addition to the conduct prohibited under the District's Ethics and Code of Conduct, employees shall not:

A. Discriminate against or harass any students or school employee on the basis of race, national origin, religion, sex, including sexual orientation, disability, color or age;

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B. Deliberately suppress or distort information or facts relevant to a student's academic progress;

C. Misrepresent or falsify student, classroom, school, or District-level data from the administration of a test or assessment;

D. Engage in a pattern of conduct for the sole purpose or with the sole intent of embarrassing or disparaging a student;

E. Use professional position or relationships with students, parents, or colleagues for improper personal gain or advantage;

F. Falsify or misrepresent documents, records, or facts related to professional qualifications or educational history or character;

G. Assist in the professional certification or employment of a person the certificate holder knows to be unqualified to hold a position;

H. Accept gratuities or gifts that influence judgment in the exercise of professional duties;

I. Possess, consume, or be under the influence of alcohol on school premises or at school-sponsored activities;

J. Illegally possess, use, or be under the influence of marijuana, dangerous drugs, or narcotic drugs, as each is defined in A.R.S. 13-3401;

K. Make any sexual advance towards a student or child, either verbal, written, or physical;

L. Engage in sexual activity, a romantic relationship, or dating of a student or child;

M. Submit fraudulent requests for reimbursement of expenses or for pay;

N. Use school equipment to access pornographic, obscene, or illegal materials; or

O. Engage in conduct which would discredit the District or the teaching profession.

~~**Categories of Misconduct**~~

~~Certificated staff members may be disciplined for infractions that include, but are not limited to, the following categories:~~

~~A. Engaging in unprofessional conduct.~~

~~B. Committing fraud in securing appointment.~~

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~~C. Exhibiting incompetency in their work.~~

~~D. Exhibiting inefficiency in their work.~~

~~E. Exhibiting improper attitudes.~~

~~F. Neglecting their duties.~~

~~G. Engaging in acts of insubordination.~~

~~H. Engaging in acts of child abuse or child molestation.~~

~~I. Engaging in acts of dishonesty.~~

~~J. Being under the influence of alcohol while on duty.~~

~~K. Engaging in the illicit use of narcotics or habit-forming drugs.~~

~~L. Being absent without authorized leave.~~

~~M. Engaging in discourteous treatment of the public.~~

~~N. Engaging in improper political activity.~~

~~O. Engaging in willful disobedience.~~

~~P. Being involved in misuse or unauthorized use of school property.~~

~~Q. Being involved in excessive absenteeism.~~

~~R. Carrying or possessing a weapon on school grounds unless they are peace officers or have obtained specific authorization from the appropriate school administrator.~~

Statutory Requirements <u>for Discipline</u>

Certificated staff members disciplined under A.R.S. 15-341, A.R.S. 15-539, or other applicable statutes:

A. May not be suspended with or without pay for a period exceeding ten (10) school days under A.R.S. 15-341.

B. May be suspended without pay for a period of time greater than ten (10) school days or dismissed under A.R.S. 15-539.

C. Shall be disciplined under procedures that provide for notice, hearing, and appeal, subject to the requirements of A.R.S. 15-341 or A.R.S. 15-539, whichever is appropriate.

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D. Shall, if disciplined under A.R.S. 15-539 or other applicable statutes, excluding A.R.S. 15-341, receive notice in writing served upon the certificated staff member personally or by United States registered or certified mail addressed to the employee's last-known address. A copy of charges specifying instances of behavior and the acts of omissions constituting the charge(s), together with a copy of all applicable statutes, shall be attached to the notice.

Statutory Requirements for Suspension and Dismissal

Certificated staff members disciplined under A.R.S. 15-341, A.R.S. 15-539, or other applicable statutes:

~~E.~~ Shall have the right to a hearing in accordance with the following:

1. *Suspension under A.R.S. 15-341.* The supervising administrator will schedule a meeting not less than two (2) days nor more than ten (10) days after the date the certificated staff member receives the notice.

2. *Dismissal or dismissal with suspension included under A.R.S. 15-539.* A certificated staff member's written request for a hearing shall be filed with the Board within ten (10) days after service of notice. The filing of a timely request shall suspend the imposition of a suspension without pay or a dismissal pending completion of the hearing.

~~**General Provisions for Discipline Under A.R.S. 15-341**~~

~~General provisions for discipline are as follows:~~

~~A. *Informal consultation.* Nothing contained herein will limit a supervising administrator's prerogative to engage in informal consultation with a certificated employee to discuss matters of concern related to the employee's performance, conduct, et cetera; however, when it is apparent that disciplinary action toward a certificated employee is likely to become a part of the certificated staff member's personnel record as permitted by A.R.S. 15-341, the procedures outlined herein shall be followed.~~

~~B. *Persons authorized to impose discipline.* Any supervising administrator who is the immediate or primary supervisor of a certificated staff member is authorized to impose a penalty or penalties, short of dismissal. Only the Board may dismiss a certificated staff member.~~

~~C. *Notice.* Any person who is required by this policy to give written notice to any other person affected by this policy may do so by any means reasonably calculated to give the recipient actual knowledge of the notice within a~~

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~~reasonable amount of time. When time is calculated from the date a notice is received, the notice is deemed to be received on the date it is hand delivered or three (3) calendar days after it is placed in the mail.~~

~~D. *Administrative discretion*. In adopting these policies and procedures, it is the intention of the District that they be interpreted and applied in a reasonable fashion. The policies and regulations are not intended to restrict or eliminate the discretion traditionally afforded to supervising administrators to determine whether discipline is appropriate. Supervising administrators are therefore directed to continue to use reasonable discretion in determining whether a particular alleged violation merits discipline.~~

~~E. *Right not to impose discipline*. The District reserves the right not to discipline a certificated staff member for conduct that violates this policy.~~

~~F. *Definition of work days*. For the purposes of this policy, a work day is any day that the District's central administrative office is open for business.~~

~~G. *Additional reasons for discipline*. A certificated staff member may be disciplined for conduct that has occurred but that, at or near the time of misconduct, was not the subject of or identified as a reason for a specific proceeding under this policy.~~

~~Procedure for Discipline~~
~~Under A.R.S. 15-341~~

~~The following procedures will be used to impose any discipline that 1) shall become a part of the certificated staff member's personnel record and 2) is permitted under A.R.S. 15-341:~~

~~Step 1 - Notice:~~

~~A. Upon the supervising administrator's determination of the existence of cause to impose discipline, the supervising administrator shall notify the certificated staff member of intent to impose discipline. The notice shall be in writing and shall be delivered in person or by first-class mail. The notice shall include the following:~~

~~1. The conduct or omission on the part of the certificated staff member that constitutes the reason for discipline.~~

~~2. A scheduled meeting time between the supervising administrator and the certificated staff member. Such meeting shall be scheduled not more than ten (10) working days after the date the certificated staff member receives the notice.~~

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~~3. A statement of the disciplinary action the supervising administrator intends to impose, including, if applicable, the number of days of suspension with or without pay.~~

~~4. Copies of any available relevant documentation, at the discretion of the supervising administrator.~~

~~Step 2 - Discipline Hearing:~~

~~A. At the hearing, the supervising administrator shall discuss with the certificated staff member the conduct that warrants disciplinary action and shall provide the certificated staff member with any appropriate evidence and a copy of relevant documentation if not previously provided.~~

~~B. The supervising administrator shall conduct the hearing in an informal manner, without adherence to the rules of evidence and procedure required in judicial proceedings.~~

~~Step 3 - Decision (in writing):~~

~~At the hearing, or within ten (10) working days following the hearing, the supervising administrator shall, in writing, inform the certificated staff member of the decision. If the decision is to impose discipline, written notice of the discipline shall be enclosed. The written notice of the decision shall state that a copy of the notice, decision, and a record of the disciplinary action shall be placed in the certificated staff member's personnel file and shall specify the date the discipline shall be imposed unless the certificated staff member files a written request for appeal within five (5) working days after the decision is delivered to the certificated staff member. If the certificated staff member requests an appeal of the decision, the imposition of any discipline shall be suspended pending the outcome of the appeal.~~

~~Step 4 - Appeal:~~

~~Discipline imposed may be appealed at the next organizational level, in writing, to the appropriate assistant superintendent or the Superintendent. Only when the discipline is determined by the Superintendent shall the appeal be to the Board, which, at its discretion, may appoint a hearing officer. The appeal shall contain a brief statement of the reasons why the certificated staff member believes the administrator's decision is incorrect. Appeal is limited to one (1) organizational level above the level of the supervising administrator who imposed the discipline.~~

~~The appeal shall specifically describe the part of the determination with which the certificated staff member disagrees:~~

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~~A. Determination was founded upon error of construction or application of any pertinent regulations or policies.~~

~~B. Determination was unsupported by any evidence as disclosed by the entire record.~~

~~C. Determination was materially affected by unlawful procedure.~~

~~D. Determination was based on violation of any statutory or constitutional right.~~

~~E. Determination was arbitrary and capricious.~~

~~F. The penalty was excessive.~~

~~The supervising administrator, the Superintendent, or, when appropriate, the Board or the Board-appointed hearing officer may, at the conclusion of the appeal, uphold the discipline, modify the decision, or refer the matter back to the level from which it was appealed for rehearing and additional information. Such decision, along with specific direction as to the effective date of any discipline, shall be communicated to the certificated staff member within a reasonable amount of time following the appeal, not to exceed seven (7) working days.~~

~~The assigned hearing officer shall, by use of a mechanical device, make a record of the appeal hearing.~~

~~This policy, under A.R.S. 15-341, does not apply to dismissal of a certificated staff member except to the extent that the Board may find, subsequent to dismissal proceedings, that a lesser form of discipline as set forth in this policy should be imposed.~~

~~Not all administrative actions regarding a certificated staff member are considered "discipline," even though they may involve alleged or possible violations by the certificated staff member. This policy addresses only discipline and has no application to any of the following:~~

~~A. The certificated staff member evaluation procedure or the resulting evaluations as they pertain to the adequacy of the certificated staff member's classroom performance.~~

~~B. Letters or memorandums directed to a certificated staff member containing directives or instructions for future conduct.~~

~~C. Counseling of a certificated staff member concerning expectations of future conduct.~~

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~~D. Nonrenewal of a contract of a certificated staff member employed by the District for less than the major portion of three (3) consecutive school years (noncontinuing certificated staff member).~~

~~General Provisions for Suspension Without Pay or Dismissal Under A.R.S. 15-539~~

~~Step 1 - Notice:~~

~~A. The Governing Board, except as otherwise provided by A.R.S. 15-539, shall upon receipt of a written statement of charges from the Superintendent that cause exists for the suspension of a certificated teacher without pay for a period longer than ten (10) school days or dismissal, shall give notice to the teacher of the Board's intention to suspend without pay or dismiss the teacher at the expiration of ten (10) days from the date of service of the notice.~~

~~1. If charges presented to the Board for dismissal of a certificated person allege immoral conduct, the charge or a resignation involving such charges shall be reported to the Department of Education.~~

~~2. Whenever the statement of charges by the Superintendent allege immoral or unprofessional conduct as the cause for dismissal, the Board may adopt a resolution to file a complaint with the State Department of Education. Pending disciplinary action by the State Board, the certificated teacher may be reassigned by the Superintendent or the Governing Board may place the teacher on administrative leave and give notice to the teacher of the administrative leave of absence pursuant to A.R.S. 15-540.~~

~~3. As used in this policy, immoral conduct means any conduct that is contrary to the moral standards of the community and that reflects an unfitness to perform the duties assigned to the certificated staff member.~~

~~B. The Governing Board, upon adoption of a written statement charging a certificated teacher with cause for suspension without pay or dismissal, may immediately place the teacher on administrative leave of absence and give the teacher notice of the administrative leave of absence.~~

~~C. Written notice of the administrative leave of absence shall be served on the teacher personally or by United States registered mail addressed to the teacher at the teacher's last known address.~~

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~~***Step 2 – Hearing for Suspension Without Pay or Dismissal:***~~

~~A. The Governing Board shall decide whether to hold a hearing on the dismissal or suspension of a certificated teacher without pay for a period of time longer than ten (10) days as provided in A.R.S. 15-541.~~

~~***PLEASE CHOOSE OPTION*** – The Governing Board may provide, **(A)** *by policy* or **(B)** *vote* at its annual organizational meeting, that all hearings conducted pursuant to this section shall be conducted before a hearing officer.~~

~~B. If the Governing Board decides not to hold a hearing, the Board shall designate a hearing officer to:~~

~~1. hold the hearing,~~

~~2. hear the evidence,~~

~~3. prepare a record of the hearing, and~~

~~4. issue a recommendation to the Board for action.~~

~~C. If the parties cannot mutually agree on a hearing officer, a hearing officer shall be selected by the Governing Board from a list provided by the State Department of Education or the American Arbitration Association.~~

~~D. A hearing held pursuant to A.R.S. 15-541 may not be conducted by any hearing officer having a personal interest which would conflict with the hearing officer's objectivity in the hearing.~~

~~E. The hearing shall be held:~~

~~1. not less than fifteen (15) days, nor~~

~~2. not more than thirty (30) days.~~

~~3. after the request is filed, unless all parties to the hearing mutually agree to a different hearing date.~~

~~F. Notice of the time and place of the hearing shall be given to the teacher not less than three (3) days before the date of the hearing.~~

~~G. The teacher may request that the hearing be conducted in public or private.~~

~~H. The Governing Board shall provide any officer, appointee, or employee to be considered or discussed at a meeting with written notice of the executive session as is appropriate but not less than twenty-four (24) hours for the officer, appointee, or employee to determine whether the discussion or consideration should occur at a public meeting.~~

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~~I. At the hearing the teacher may appear in person and by counsel, if desired, and may present any testimony, evidence or statements, either oral or in writing, in the teacher's behalf.~~

~~J. An official record of the hearing, including all testimony recorded manually or by mechanical device, and exhibits shall be prepared by the Governing Board or the hearing officer.~~

~~K. The teacher who is the subject of the hearing may not request that the testimony be transcribed unless the teacher agrees in writing to pay the actual cost of the transcription.~~

~~L. Within ten (10) days after a hearing conducted by the Governing Board the Board shall:~~

~~1. determine whether there existed good and just cause for the notice of dismissal or suspension, and~~

~~2. affirm or withdraw the notice of dismissal or suspension.~~

~~M. Within ten (10) days after a hearing conducted by a hearing officer, the hearing officer shall:~~

~~deliver a written recommendation to the Governing Board that includes findings of fact and conclusions.~~

~~N. Parties to the hearing have the right to object to the findings of the hearing officer and present oral and written arguments to the Governing Board.~~

~~O. The Governing Board has an additional ten (10) days to determine whether good and just cause existed for the notice of dismissal or suspension and shall render its decision accordingly, either affirming or withdrawing the notice of suspension or dismissal.~~

~~Good and just cause does not include religious or political beliefs or affiliations unless they are in violation of the oath of the teacher.~~

~~Additional Provisions and Conditions~~

~~During the pendency of a hearing, neither the certificated staff member nor the supervising administrator shall contact the Superintendent or a Board member to discuss the merits of the supervising administrator's recommendation or charges and proposed discipline except as provided by this policy. No attempt shall be made during such period to discuss the merits of the charges with the person designated to act as hearing officer.~~

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~~The Governing Board shall keep confidential the name of a student involved in a hearing for dismissal, discipline, or action on a teacher's certificate, with exceptions as noted in A.R.S. 15-551.~~

~~State Board of Education~~

~~The highest ranking official of a school or school district (that employs the person or to whom the person has applied for employment) may request from the State Board of Education information relating to allegations that a certificated or noncertificated person engaged in conduct that, if true, constitutes grounds for disciplinary action if the certificated or noncertificated person resigned or otherwise separated from employment with a school before the State Board of Education either investigates the allegations or determines whether to take disciplinary action against the person.~~

~~The State Board of Education, after verifying the official's identity, shall provide the requested information, if available, to the official or designee. If providing the requested information might impede the State Board of Education's investigation of the allegations, the State Board of Education may deny the official's request or provide the information to the official or administrator after the State Board of Education completes the investigation.~~

~~*Amendments*. The District reserves the right to amend this policy in any way at any time. Any amendment shall have prospective application only.~~

~~*Severability*. If any provision of this policy is held to be invalid for any reason, such action shall not invalidate the remainder of this policy. If any provision of this policy conflicts with any provisions in any other policies adopted by the District, the provisions of this policy shall prevail.~~

Teachers Working Under a Short-Term Certification

A teacher who holds a teaching intern certificate, an emergency teaching certificate or another type of nonstandard certificate, that is valid for one (1) year or less, may be dismissed by the Board effective ten (10) days after delivery of the notice of dismissal to the teacher without complying with the requirements of A.R.S. conditions found in 15-537, 15-538, or 15-541. Notice of the Board's authority to dismiss pursuant to this shall be included in each teacher's contract.

Adopted: _____

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LEGAL REF.:
A.R.S.
13-2911
13-3401
15-153
15-203
15-341
15-342
15-350
15-502
15-503
15-505
15-507
15-508
15-512
15-514
15-536
15-538
15-538.01
15-538.02
15-539
15-540
15-541
15-542
15-543
15-549
15-550
15-551
23-1501
41-770
41-773
A.A.C.
R7-2-1308
20 U.S.C. 1681

CROSS REF.:
DK - Payment and Payroll Procedures
~~DKA - Payroll Procedures/Schedules~~
~~GCJ - Professional Staff Noncontinuing and Continuing Status~~
GCO - Evaluations ~~of Professional Staff Members~~ and Contracts

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GCQF-RA ©

REGULATION

DISCIPLINE, SUSPENSION, AND DISMISSAL

(Certificated Employees)

Provisions

General provisions for discipline are as follows:

A. *Informal consultation.* Nothing contained herein will limit a supervising administrator's prerogative to engage in informal consultation with a certificated employee to discuss matters of concern related to the employee's performance, conduct, et cetera; however, when it is apparent that disciplinary action toward a certificated employee is likely to become a part of the certificated staff member's personnel record as permitted by A.R.S. 15-341, the procedures outlined herein shall be followed.

B. *Persons authorized to impose discipline.* Any supervising administrator who is the immediate or primary supervisor of a certificated staff member is authorized to impose a penalty or penalties, short of dismissal. Only the Board may dismiss a certificated staff member.

C. *Notice.* Any person who is required by Policy GCQF and this regulation to give written notice to any other person affected by Policy GCQF and this regulation may do so by any means reasonably calculated to give the recipient actual knowledge of the notice within a reasonable amount of time. When time is calculated from the date a notice is received, the notice is deemed to be received on the date it is hand delivered or three (3) calendar days after it is placed in the mail.

D. *Administrative discretion.* In adopting these policies and procedures, it is the intention of the District that they be interpreted and applied in a reasonable fashion. The policies and regulations are not intended to restrict or eliminate the discretion traditionally afforded to supervising administrators to determine whether discipline is appropriate. Supervising administrators are therefore directed to continue to use reasonable discretion in determining whether a particular alleged violation merits discipline.

E. *Right not to impose discipline.* The District reserves the right not to discipline a certificated staff member for conduct that violates Policy GCQF and this regulation.

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F. *Definition of business days*. For the purposes of this regulation, a business day is any day that the District's central administrative office is open for business.

G. *Additional reasons for discipline*. A certificated staff member may be disciplined for conduct that has occurred but that, at or near the time of misconduct, was not the subject of or identified as a reason for a specific proceeding under Policy GCQF and this regulation.

Procedures

The following procedures will be used to impose any discipline that 1) shall become a part of the certificated staff member's personnel record and 2) is permitted under A.R.S. 15-341:

Step 1 - Notice:

Upon the supervising administrator's determination of the existence of cause to impose discipline, the supervising administrator shall notify the certificated staff member of intent to impose discipline. The notice shall be in writing and shall be delivered in person or by first-class mail. The notice shall include the following:

1. The conduct or omission on the part of the certificated staff member that constitutes the reason for discipline.

2. A scheduled meeting time between the supervising administrator and the certificated staff member. Such meeting shall be scheduled not more than ten (10) business days after the date the certificated staff member receives the notice.

3. A statement of the disciplinary action the supervising administrator intends to impose, including, if applicable, the number of days of suspension with or without pay.

4. Copies of any available relevant documentation, at the discretion of the supervising administrator.

Step 2 - Discipline Hearing:

A. At the hearing, the supervising administrator shall discuss with the certificated staff member the conduct that warrants disciplinary action and shall provide the certificated staff member with any appropriate evidence and a copy of relevant documentation if not previously provided.

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B. The supervising administrator shall conduct the hearing in an informal manner, without adherence to the rules of evidence and procedure required in judicial proceedings.

Step 3 - Decision (in writing):

At the hearing, or within ten (10) business days following the hearing, the supervising administrator shall, in writing, inform the certificated staff member of the decision. If the decision is to impose discipline, written notice of the discipline shall be enclosed. The written notice of the decision shall state that a copy of the notice, decision, and a record of the disciplinary action shall be placed in the certificated staff member's personnel file and shall specify the date the discipline shall be imposed unless the certificated staff member files a written request for appeal within five (5) business days after the decision is delivered to the certificated staff member. If the certificated staff member requests an appeal of the decision, the imposition of any discipline shall be suspended pending the outcome of the appeal.

Step 4 – Appeal:

Discipline imposed may be appealed at the next organizational level, in writing, to the appropriate assistant superintendent or the Superintendent. Only when the discipline is determined by the Superintendent shall the appeal be to the Board, which, at its discretion, may appoint a hearing officer. The appeal shall contain a brief statement of the reasons why the certificated staff member believes the administrator's decision is incorrect. Appeal is limited to one (1) organizational level above the level of the supervising administrator who imposed the discipline.

The appeal shall specifically describe the part of the determination with which the certificated staff member disagrees:

A. Determination was founded upon error of construction or application of any pertinent regulations or policies.

B. Determination was unsupported by any evidence as disclosed by the entire record.

C. Determination was materially affected by unlawful procedure.

D. Determination was based on violation of any statutory or constitutional right.

E. Determination was arbitrary and capricious.

F. The penalty was excessive.

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Decision

The supervising administrator, the Superintendent, or, when appropriate, the Board or the Board-appointed hearing officer may, at the conclusion of the appeal, uphold the discipline, modify the decision, or refer the matter back to the level from which it was appealed for rehearing and additional information. Such decision, along with specific direction as to the effective date of any discipline, shall be communicated to the certificated staff member within a reasonable amount of time following the appeal, not to exceed seven (7) business days.

The assigned hearing officer shall, by use of a mechanical device, make a record of the appeal hearing.

Actions Not Covered

This regulation, under A.R.S. 15-341, does not apply to dismissal of a certificated staff member except to the extent that the Board may find, subsequent to dismissal proceedings, that a lesser form of discipline as set forth in Policy GCQF and this regulation should be imposed.

Not all administrative actions regarding a certificated staff member are considered "discipline," even though they may involve alleged or possible violations by the certificated staff member. This regulation addresses only discipline and has no application to any of the following:

A. The certificated staff member evaluation procedure or the resulting evaluations as they pertain to the adequacy of the certificated staff member's classroom performance.

B. Letters or memorandums directed to a certificated staff member containing directives or instructions for future conduct.

C. Counseling of a certificated staff member concerning expectations of future conduct.

D. Nonrenewal of a contract of a certificated staff member employed by the District for less than the major portion of three (3) consecutive school years (noncontinuing certificated staff member).

Suspension Without Pay or Dismissal

Step 1 - Notice:

A. The Governing Board, except as otherwise provided by A.R.S. 15-539, shall upon receipt of a written statement of charges from the Superintendent that cause exists for the suspension of a certificated teacher without pay for a period longer than ten (10) school days or dismissal, shall give notice to the teacher of the Board's intention to suspend without pay or dismiss the teacher at the expiration of ten (10) days from the date of service of the notice.

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1. If charges presented to the Board for dismissal of a certificated person allege immoral conduct, the charge or a resignation involving such charges shall be reported to the Department of Education.

2. Whenever the statement of charges by the Superintendent allege immoral or unprofessional conduct as the cause for dismissal, the Board may adopt a resolution to file a complaint with the State Department of Education. Pending disciplinary action by the State Board, the certificated teacher may be reassigned by the Superintendent or the Governing Board may place the teacher on administrative leave and give notice to the teacher of the administrative leave of absence pursuant to A.R.S. 15-540.

3. As used in this regulation, *immoral conduct* means any conduct that is contrary to the moral standards of the community and that reflects an unfitness to perform the duties assigned to the certificated staff member.

B. The Governing Board, upon adoption of a written statement charging a certificated teacher with cause for suspension without pay or dismissal, may immediately place the teacher on administrative leave of absence and give the teacher notice of the administrative leave of absence.

C. Written notice of the administrative leave of absence shall be served on the teacher personally or by United States registered mail addressed to the teacher at the teacher's last known address.

Step 2 – Hearing for Suspension Without Pay or Dismissal:

A. The Governing Board shall decide whether to hold a hearing on the dismissal or suspension of a certificated teacher without pay for a period of time longer than ten (10) days as provided in A.R.S. 15-541.

PLEASE CHOOSE OPTION - The Governing Board may provide, **(A)** *by policy* or **(B)** *vote* at its annual organizational meeting, that all hearings conducted pursuant to this section shall be conducted before a hearing officer.

B. If the Governing Board decides not to hold a hearing, the Board shall designate a hearing officer to:

1. hold the hearing,

2. hear the evidence,

3. prepare a record of the hearing, and

4. issue a recommendation to the Board for action.

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C. If the parties cannot mutually agree on a hearing officer, a hearing officer shall be selected by the Governing Board from a list provided by the State Department of Education or the American Arbitration Association.

D. A hearing held pursuant to A.R.S. 15-541 may not be conducted by any hearing officer having a personal interest which would conflict with the hearing officer's objectivity in the hearing.

E. The hearing shall be held:

1. not less than fifteen (15) days, nor

2. not more than thirty (30) days.

3. after the request is filed, unless all parties to the hearing mutually agree to a different hearing date.

F. Notice of the time and place of the hearing shall be given to the teacher not less than three (3) days before the date of the hearing.

G. The teacher may request that the hearing be conducted in public or private.

H. The Governing Board shall provide any officer, appointee, or employee to be considered or discussed at a meeting with written notice of the executive session as is appropriate but not less than twenty-four (24) hours for the officer, appointee, or employee to determine whether the discussion or consideration should occur at a public meeting.

I. At the hearing the teacher may appear in person and by counsel, if desired, and may present any testimony, evidence or statements, either oral or in writing, in the teacher's behalf.

J. An official record of the hearing, including all testimony recorded manually or by mechanical device, and exhibits shall be prepared by the Governing Board or the hearing officer.

K. The teacher who is the subject of the hearing may not request that the testimony be transcribed unless the teacher agrees in writing to pay the actual cost of the transcription.

L. Within ten (10) days after a hearing conducted by the Governing Board the Board shall:

1. determine whether there existed good and just cause for the notice of dismissal or suspension, and

2. affirm or withdraw the notice of dismissal or suspension.

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M. Within ten (10) days after a hearing conducted by a hearing officer, the hearing officer shall:

deliver a written recommendation to the Governing Board that includes findings of fact and conclusions.

N. Parties to the hearing have the right to object to the findings of the hearing officer and present oral and written arguments to the Governing Board.

O. The Governing Board has an additional ten (10) days to determine whether good and just cause existed for the notice of dismissal or suspension and shall render its decision accordingly, either affirming or withdrawing the notice of suspension or dismissal.

Good and just cause does not include religious or political beliefs or affiliations unless they are in violation of the oath of the teacher.

Additional Provisions and Conditions

During the pendency of a hearing, neither the certificated staff member nor the supervising administrator shall contact the Superintendent or a Board member to discuss the merits of the supervising administrator's recommendation or charges and proposed discipline except as provided by Policy GCQF and this regulation. No attempt shall be made during such period to discuss the merits of the charges with the person designated to act as hearing officer.

The Governing Board shall keep confidential the name of a student involved in a hearing for dismissal, discipline, or action on a teacher's certificate, with exceptions as noted in A.R.S. 15-551.

State Board of Education

The highest ranking official of a school or school district (that employs the person or to whom the person has applied for employment) may request from the State Board of Education information relating to allegations that a certificated or noncertificated person engaged in conduct that, if true, constitutes grounds for disciplinary action if the certificated or noncertificated person resigned or otherwise separated from employment with a school before the State Board of Education either investigates the allegations or determines whether to take disciplinary action against the person.

The State Board of Education, after verifying the official's identity, shall provide the requested information, if available, to the official or designee. If providing the requested information might impede the State Board of Education's investigation of the allegations, the State Board of Education may deny the official's request or provide the information to the official or administrator after the State Board of Education completes the investigation.

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Amendments. The District reserves the right to amend Policy GCQF and this regulation in any way at any time. Any amendment shall have prospective application only.

Severability. If any provision of Policy GCQF and this regulation is held to be invalid for any reason, such action shall not invalidate the remainder of Policy GCQF and this regulation. If any provision of Policy GCQF and this regulation conflicts with any provisions in any other policies adopted by the District, the provisions of Policy GCQF and this regulation shall prevail.

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GCQF-RB ©

REGULATION

DISCIPLINE, SUSPENSION, AND DISMISSAL

(Noncertificated Employees)

Definitions

At-will employee, as used in this Section GCQF-RB, means a noncertificated employee whose employment relationship is severable at the pleasure of either the employee or the District unless a written contract or applicable law expressly provides otherwise.

Term employee, as used in this Section GCQF-RB, means a noncertificated employee working under a written employment contract or other written employment arrangement for a specified duration of time or otherwise expressly restricting the District's right to terminate the employment relationship.

Cause, as used in this Section GCQF-RB, means unprofessional or immoral conduct, violation of Policy GCQF, violation of Board policy or regulation, violation of the District's Ethics and Code of Conduct, or other conduct that, in the judgment of the District, warrants corrective/disciplinary action—including, but not limited to: Fraud or misrepresentation in securing appointment; Incompetency; Inefficiency; Neglect of duty; Insubordination; Dishonesty; Being impaired by alcohol or drugs while on duty; Illegal use or illegal possession of a narcotic or habit-forming drug; Unauthorized absence or absence without leave; Commission of any crime classified as a felony or involving moral turpitude; Discourteous treatment of the public or other employees; Improper political activity; Willful disobedience; and/or Misuse or unauthorized use of government property.

Grounds for Discipline

A noncertificated employee may be disciplined for unprofessional or immoral conduct, violation of Policy GCQF, violation of Board policy or regulation, violation of the District's Ethics and Code of Conduct, or other conduct that, in the judgment of the District, warrants corrective/disciplinary action.

Disciplinary Action

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The District may impose progressive discipline, up to and including dismissal, that may include verbal or written reprimand, suspension without pay, or other appropriate action.

The Superintendent may investigate alleged misconduct and may place an employee on administrative leave, with or without pay as permitted by law, pending investigation.

Suspension Without Pay

At-will employees. An at-will employee may be suspended without pay for conduct that, in the judgment of the Superintendent, warrants such action. Before suspending an at-will employee without pay, the employee shall be informed of the nature of the concerns and given an opportunity to respond, unless immediate action is necessary to protect students, employees, property, or District operations. The Superintendent's decision will be final unless otherwise provided by Board policy.

Term employees. A term employee may be suspended without pay during the term of employment for cause. If the Superintendent recommends suspension without pay of a term employee, the employee shall be given written notice of the recommendation and the reasons for it. The employee may request a hearing in accordance with the hearing procedures set forth below for suspension without pay or dismissal of a term employee. If no hearing is requested within the time provided, the recommended suspension without pay may be imposed.

Minor disciplinary action that does not include dismissal or suspension without pay may be imposed without use of the hearing procedures set forth below unless otherwise required by contract or law.

Dismissal

At-will employees. An at-will employee may be dismissed by the Governing Board at any time, subject to applicable law and any written contract. If the Superintendent recommends dismissal of an at-will employee, the recommendation shall be submitted to the Governing Board in writing and a copy of the recommendation shall be delivered to the employee. The at-will employee may submit a written response to the Governing Board before the Board considers the recommendation. If the at-will employee attends the Board meeting at which the recommendation is considered, the Governing Board may, in its discretion and consistent with applicable law, permit the employee to address the Governing Board concerning the recommendation.

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Term employees. A term employee may be dismissed for cause by the Governing Board at any time prior to the expiration of the term of employment.

Term Employee: Process for Suspension Without Pay or Dismissal

If the Superintendent recommends suspension without pay or dismissal of a term employee, a copy of the recommendation shall be delivered to the employee.

The employee may request a hearing within five (5) business days after receipt of the recommendation. If a hearing is requested, the Superintendent shall deliver written notice of the time and place of the hearing and a written statement of the reasons for the recommendation. The notice may also include a list of persons whom the Superintendent expects to testify and a general description of any other evidence that may be presented at the hearing in support of the recommendation.

The hearing shall be conducted by the Governing Board or by a hearing officer designated by the Governing Board within not less than five (5) business days and not more than thirty (30) calendar days after a request for hearing is submitted, unless postponed by agreement of the parties or by the Governing Board or hearing officer for good cause.

The employee may be represented at the hearing by counsel, at the employee's expense. The employee shall have the opportunity to present witnesses and other relevant evidence and to question witnesses presented by the District. Formal rules of evidence shall not apply. A record of the hearing shall be made by mechanical or electronic means.

If a hearing officer is used, the hearing officer shall prepare written findings and a disciplinary recommendation for the Governing Board within ten (10) business days after the conclusion of the hearing. The Governing Board shall review the findings and recommendation and render a final decision whether to accept, reject, or modify the hearing officer's findings and/or recommendation.

If the Governing Board conducts the hearing, it shall render a decision within ten (10) business days after the conclusion of the hearing.

If the employee does not timely request a hearing, the employee shall be deemed to have waived the right to a hearing, and the Governing Board may act on the recommendation.

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The Governing Board's decision shall be final.

State Board of Education Discipline/Duty to Report

A noncertificated employee who meets the definition of noncertificated person in A.R.S. 15-505 may also be subject to investigation and discipline by the State Board of Education for immoral or unprofessional conduct as provided by law and State Board rules.

Nothing in this regulation limits or replaces any duty to report suspected conduct involving minors, suspected immoral or unprofessional conduct, arrest or charge information, criminal conviction information, or other legally reportable matters to law enforcement, the State Board of Education, the Department of Public Safety, or other authorities as required by law.

The District shall not accept the resignation of a certificated or noncertificated person when there is a reasonable suspicion or allegation of conduct involving minors that must be reported to the State Board of Education as required by law until the required report has been made.

General Matters

None of the procedures of this regulation shall alter the status of an at-will employee.

Failure to timely request a hearing or otherwise timely respond as provided in this regulation shall constitute a waiver of further review under this regulation.

The filing or pendency of a complaint or other form of grievance under another policy shall not limit or delay action authorized by this regulation unless otherwise required by contract or law.

This regulation does not apply to:

A. nonrenewal of a term employee at the expiration of the employee's contract, unless otherwise expressly provided by contract or law;

B. ratings, comments, or recommendations made in the course of an evaluation;

C. placement on administrative leave; or

D. counseling, directives, or supervisory instructions regarding future conduct or performance.

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ADVISORY 1021

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NONSCHOOL EMPLOYMENT ~~BY PROFESSIONAL STAFF MEMBERS~~

A regular, full-time employee's position in the District shall be given precedence over any type of outside work or self-employment. ~~Employees are free to carry on individual work or self-employment projects as long as no~~ District facilities, equipment, or school(s) are not to be used, except as provided by policy, and the outside work or self-employment ~~does~~ must not interfere with the employees' performance of District-assigned duties.

The outside work or self-employment by a staff member is of concern to the Board ~~insofar as~~ if it may:

A. Prevent the employee from performing assigned responsibilities in an effective manner.

B. Be prejudicial to proper effectiveness in the position or compromise the District.

C. Raise a question of conflict of interest - for example, where the employee's position in the District permits access to information or other advantage useful to the outside employer.

~~Therefore, a~~An employee may not perform any duties related to outside work or self-employment during regular District working hours or during the additional time that is needed to fulfill the responsibilities of the District position. Employees who violate this policy are subject to reprimand, suspension, or termination.

Adopted: _____

LEGAL REF.:
A.R.S.
15-321
15-341

CROSS REF.:
EDB - Maintenance and Control of Materials and Equipment, and Instructional Materials
KF - Community Use of School Facilities

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ADVISORY 1022

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TUTORING FOR PAY

Except by prior written authorization from the Superintendent:

A. School buildings are not to be used for private tutoring or classes for which students pay a fee to a staff member unless a rental contract has been entered into with the District.

B. A staff member is not permitted to provide tutoring for pay to any student who attends or is registered in any of the staff member's own classes.

Any person contracted by the state or District to provide tutoring services directly to ~~pupils~~ students shall be required to obtain a fingerprint clearance card prior to such services being provided.

Adopted: _____

LEGAL REF.:
A.R.S.
15-341
15-512
15-534
15-1105
A.G.O.
R97-023

CROSS REF:
GCF - ~~Professional Staff~~ Hiring
KF - Community Use of School Facilities
LDA - Student Teaching and Internships

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ADVISORY 1023

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PROFESSIONAL RESEARCH AND PUBLISHING

Proprietary Rights

The Board has proprietary rights to publications, instructional materials, and devices prepared by employees unless prepared by such employees on their own time and without use of school facilities and/or equipment.

A. The Board authorizes the Superintendent to review material prepared by staff members prior to copyright or patent for subsequent publication or distribution, and to recommend waiving all or part of the Board's proprietary rights in favor of the employees involved in preparing such materials, subject to Board approval.

B. Any staff member who submits professional materials for publication in which the District is mentioned will submit all such material to the Superintendent prior to release for publication, including materials developed on the employee's own time.

Adopted: _____

LEGAL REF.:
A.R.S.
15-341
17 U.S.C. 201

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ADVISORY 1024

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~~GDA ©~~
~~SUPPORT STAFF POSITIONS~~

~~Support staff positions are created only with the approval of the Board. The District will attempt to activate a sufficient number of positions to accomplish the District's goals and objectives.~~

~~Before recommending the establishment of any new position, the Superintendent will present a job description for the position that specifies the qualifications, the performance responsibilities, and the method by which the performance of such responsibilities will be evaluated. The establishment of any new position will require Governing Board approval.~~

~~The Superintendent will maintain a comprehensive and up-to-date set of job descriptions of all positions in the school system.~~

~~Adopted: _____~~

~~LEGAL REF.:~~
~~A.R.S.~~
~~15-341~~
~~15-502~~

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ADVISORY 1025

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~~GDB ©~~
~~SUPPORT STAFF CONTRACTS AND COMPENSATION~~

~~Support staff members are all employees of the District who are not required by state law or by a District policy, regulation, or job description to possess from the Arizona Department of Education for the purpose of performing their jobs, unless they are expressly designated as professional staff members in notices of employment or contracts executed by the Governing Board.~~

~~Employment Status~~

~~All support personnel are either term employees or at-will employees of the District.~~

~~Term employee. A term employee is a support staff member who is employed by the District pursuant to a written contract that specifies the duration of the employment contract, which shall not exceed one (1) year. All support staff members who are not term employees are at-will employees.~~

~~At-will employee. An at-will employee is a support staff member who is employed by the District for no specific term and who has no right of continued employment. The employment of an at-will employee may be terminated by action of the Governing Board without advance notice. No employee or Governing Board member shall have the authority to make any agreement or contract to the contrary or any agreement with an at-will employee for any specified period of time. No District policy or regulation or item within the District's handbook is intended to - and shall not operate to - create any property or contract rights inconsistent with the at-will employment status of support staff members.~~

~~Compensation~~

~~The Board will determine salaries and benefits of support staff employees, differentiated on the basis of duties and responsibilities.~~

~~Every fiscal year, each School District employee will be provided a total compensation statement that is broken down by category of benefit or payment and that includes, for that employee, at least all of the following:~~

~~A. Base salary and any additional pay.~~

~~B. Medical benefits and the value of any employer-paid portions of insurance plan premiums.~~

~~C. Retirement benefit plans, including social security.~~

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~~D. Legally required benefits.~~

~~E. Any paid leave.~~

~~F. Any other payment made to or on behalf of the employee.~~

~~G. Any other benefit provided to the employee.~~

~~Adopted: _____~~

~~LEGAL REF.:~~
~~A.R.S.~~
~~15-341~~
~~15-502~~
~~A.A.C.~~
~~R7-2-601 *et seq.*~~

~~CROSS REF.:~~
~~GDQB - Resignation of Support Staff Members~~

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ADVISORY 1026

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~~GDBA ©~~
~~SUPPORT STAFF SALARY~~

~~(Wages)~~

~~Initial Placement~~

~~Wages for all new support staff personnel and for all currently employed personnel selected for another position in the District will be recommended by the Superintendent and approved by the Board at the time of employment. The Superintendent's recommendation will be based on consideration of the candidate's qualifications, relevant job experience, and years of District employment, if applicable.~~

~~Advancement~~

~~Advancements for regular twelve (12)-month employees are granted only at the beginning of each fiscal year. Annual increases may be withheld if it is determined the employee does not perform at the expected level or does not meet standards for the job.~~

~~An employee must work one (1) day more than one-half (1/2) of the year to receive an advancement in wages.~~

~~Adopted: _____~~

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ADVISORY 1027

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~~GDBC ©~~
~~SUPPORT STAFF SUPPLEMENTARY~~
~~PAY / OVERTIME~~

~~The Superintendent will recommend extra-duty pay each year for the Board's review and action.~~

~~Whenever applicable, pay for extra duty must be coordinated with regular pay in accord with the requirements of the Fair Labor Standards Act.~~

~~Adopted: _____~~

~~LEGAL REF.:~~
~~A.R.S.~~
~~15-502~~
~~29 U.S.C. 207, Fair Labor Standards Act~~

~~CROSS REF.:~~
~~GDL - Support Staff Workload~~

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~~GDBD ©~~
~~SUPPORT STAFF FRINGE BENEFITS~~

~~The Governing Board will review support staff fringe benefits each year during the budget process and may modify the benefits to meet the best interest of the District.~~

~~Minimum standards of eligibility for fringe benefits will be determined by the Board annually.~~

~~Adopted: _____~~

~~LEGAL REF.:~~
~~A.R.S.~~
~~15-502~~

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~~SUPPORT STAFF VOLUNTARY~~
~~TRANSFER OF ACCRUED SICK LEAVE~~

~~The District recognizes the existence of circumstances under which non-job-related, seriously incapacitating, and extended illnesses and injury may exhaust accrued leave of support staff employees. To provide some measure of relief in such situations, a limited mechanism, based upon voluntary transfer of accrued leave, is established. The mechanism will be termed *banked sick leave*, or a *sick leave bank*. It is considered of benefit to the District to establish this mechanism because it will reduce the annual accrued sick leave and promote efficiency by ensuring constant service.~~

~~Limits:~~

~~A. The value of banked sick leave will be limited to the equivalent of one hundred (100) days multiplied by the federal minimum wage rate times eight (8) hours, or less, depending on contributions.~~

~~B. No employee shall be entitled to receive banked sick leave by reason of contribution or employment.~~

~~C. Each approved applicant is limited to the one-time use of no more than one hundred (100) consecutive days of the available limited sick leave from the sick leave bank in any school year.~~

~~D. Additional leave will not be earned/accrued during use of banked sick leave.~~

~~E. All unused banked sick leave will expire at the end of each contract year.~~

~~Voluntary contributions:~~

~~A. Support staff members may voluntarily contribute a maximum of one (1) day of earned/accrued sick leave to the sick leave bank annually. Such contribution must be from the current year's sick leave earned/accrued, the value of which will be determined by the number of days multiplied by the federal minimum wage rate times eight (8) hours.~~

~~B. Each staff member contributing leave to the sick leave bank acknowledges an uncoerced, voluntary release of the leave, the value it represents, and that it will not be returned but will expire at the end of the fiscal year in which it is contributed.~~

~~C. In case of contributions exceeding the value of the sick leave bank limit, each contribution will be accepted on a first-come, first-served basis by date of signature.~~

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~~***Eligibility (for use of sick leave bank).*** The approved applicant shall:~~

~~A. Be a full-time employee.~~

~~B. Have a non-job-related, seriously incapacitating, and extended illness or injury.~~

~~C. Have exhausted all earned/accrued leave of any nature or kind.~~

~~D. Be presently on unpaid leave status with the District.~~

~~E. Not be eligible for disability benefits, including but not limited to Social Security, provided at District expense.~~

~~F. Be one whose return to duty is projected to occur within a period no longer than six (6) months.~~

~~G. Submit an application, which shall be received by the District office within ten (10) days following the applicant's beginning unpaid leave status.~~

~~***Application:***~~

~~A. The application must be in writing.~~

~~B. The application must be supported by a physician's statement confirming the conditions required for receipt of sick leave bank assistance.~~

~~C. Data in the application shall include the nature of the illness, the diagnosis, and the prognosis for return to duty.~~

~~***Determining eligibility:***~~

~~The Superintendent shall receive the applications and shall screen for and determine eligibility.~~

~~No continuing rights are established by this policy. In compliance with established procedure, the Governing Board reserves the right to modify or rescind any policy in accord with its own guidelines.~~

~~Adopted: _____~~

~~LEGAL REF.:~~
~~A.G.O.~~
~~I91-027~~

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~~REGULATION~~

~~SUPPORT STAFF VOLUNTARY TRANSFER OF ACCRUED SICK LEAVE~~

~~Application Screening Committee~~

~~A committee consisting of one (1) staff member from each building and one (1) from the central staff selected by the support staff and an administrator appointed by the Superintendent shall review each application and submit a recommendation to the Superintendent. The applications are to be reviewed in accord with the guidelines found in policy and as presented below:~~

~~A. The application must be in writing.~~

~~B. The application must be supported by the appropriate documentation as defined in A.R.S. 23-373.~~

~~C. Data in the application shall include the expected date for return to duty.~~

~~D. The application shall be received by the District office within ten (10) days following the beginning of the applicant's unpaid-leave status.~~

~~For approval, the applicant shall:~~

~~A. Be a full-time employee.~~

~~B. Have a non-job-related need, as defined in A.R.S. 23-373, for sick leave.~~

~~C. Be presently on unpaid-leave status with the District.~~

~~D. Not be eligible for disability benefits, including but not limited to Social Security, provided at District expense.~~

~~E. Be one whose return to duty is projected to occur within a period no longer than six (6) months.~~

~~F. Submit an application, which shall be received by the District office within ten (10) days following the beginning of the applicant's unpaid-leave status.~~

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~~SUPPORT STAFF~~
~~VACATIONS AND HOLIDAYS~~

~~All regular twelve (12)-month support staff employees shall accumulate vacation with pay at the rate of one (1) working day per month during the first year of employment. Thereafter, vacation shall be accumulated at the rate of one and one-fourth (1-1/4) working days per month, with the accumulated maximum of fifteen (15) days, at which time no more vacation can be earned. As accumulated vacation days are used and drop below fifteen (15) days, an eligible employee may again accumulate vacation up to the maximum limit. Vacations shall be taken as approved by the Superintendent.~~

~~Employees shall be entitled to all legal holidays during the school year as announced by the Superintendent and in conformance with Arizona Revised Statutes. Uncompensated days off will be established by the Board and noted on each year's school calendar.~~

~~Adopted: _____~~

~~LEGAL REF.:~~
~~A.R.S.~~
~~1-301~~
~~15-502~~
~~15-801~~
~~38-608~~

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ADVISORY 1031

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~~SUPPORT STAFF HIRING~~

~~It shall be the policy of the District to employ and retain the best qualified personnel. This will be accomplished by considering qualifications and by providing competitive wages within the financial capabilities of the District, adequate facilities, and good working conditions.~~

~~Recruitment of support staff personnel is the responsibility of the Superintendent. Other members of the administration and supervisory staff will assist as responsibilities are delegated by the Superintendent.~~

~~Before employing a certificated or noncertificated person, school districts and charter schools shall conduct a search of the prospective employee on the educator information system that is maintained by the Department of Education.~~

~~A school district or charter school may not employ either of the following in a position that requires a valid fingerprint clearance card:~~

> ~~A. A certificated person whose certificate has been suspended, surrendered or revoked, unless the State Board of Education has subsequently reinstated the person's certificate.~~
>
> ~~B. A noncertificated person who has been prohibited from employment at a school district or charter school by the State Board of Education pursuant to subsection b of this section.~~

~~Candidates shall disclose whether they have pled guilty, pled no contest, been convicted of or are awaiting trial pursuant to A.R.S. 15-509.~~

~~Each school district and charter school shall annually submit to the Department of Education a list of certificated and noncertificated persons who are employed at the school district or charter school. The department shall issue guidance to school districts and charter schools regarding this requirement.~~

~~The Board adopts the following general criteria and procedures, which shall be utilized in the selection process for initial employment:~~

> ~~A. There will be no discrimination in the hiring process due to race, color, religion, sex, age, national origin, or disability of an otherwise qualified individual.~~
>
> ~~B. Candidates for all positions shall be physically and mentally able to perform the duties of the position job descriptions for which they have applied.~~

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~~C. Each candidate shall be requested to complete a consent-and-release form regarding conduct of a background investigation.~~

~~D. A "background investigation" - consisting of communication with the applicant's (or employee's) former employer that concerns education, training, experience, qualifications, and job performance for the purpose of evaluation for employment - shall be conducted on each individual to be considered for a recommendation of employment. Forms developed for this purpose are to be used.~~

~~Information obtained about an employee or applicant for employment by the District in the performance of a background investigation, including any records indicating that a current or former employee of a school or school district was disciplined for violating policies of the School District Governing Board pursuant to A.R.S. 15-153, may be retained by that District and may be provided to any school district or other public school that is performing a background investigation.~~

~~Any employee's misstatement of fact that is material to qualifications for employment or the determination of salary shall be considered by the Board to constitute grounds for dismissal.~~

~~A district may hire and place a noncertificated employee into service before receiving the results of the mandatory fingerprint check or a fingerprint clearance card has been issued or denied. However, until fingerprint clearance has been received, an applicant who is required or allowed to have unsupervised contact with pupils cannot be hired and placed into service until:~~

~~A. The District documents in the applicant's file the necessity for hiring and placing the applicant into service before a fingerprint check can be completed or a fingerprint clearance card is issued or denied.~~

~~B. The District obtains from the Department of Public Safety a statewide criminal records information check on the applicant. Subsequent criminal records checks are also required every one hundred twenty (120) days until the date that the fingerprint check is completed or the fingerprint clearance card is issued or denied.~~

~~C. The District obtains references from the applicant's current employer and two (2) most recent previous employers, except that for applicants who have been employed for at least five (5) years by the most recent employer, only references from that employer are required.~~

~~D. The District provides general supervision of the applicant until the date the fingerprint check is completed or the fingerprint clearance card is issued or denied.~~

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~~Upon recommendation for employment the District shall confirm employment authorization and employment eligibility verification by participating in the E-Verify program of the Department of Homeland Security's (DHS) U.S. Citizenship and Immigration Services Bureau (USCIS) and the Social Security Administration (SSA). The District will then complete the Form I-9 as required and maintain the form with copies of the necessary documents and documentation of the authorization and verification pending any inquiry.~~

~~The District reports to the Superintendent of Public Instruction on June 30 and December 31 the number of applicants hired prior to the completion of a fingerprint check or the issuance of a fingerprint clearance card and the number of applicants for whom fingerprint checks or fingerprint clearance cards have not been received after one hundred twenty (120) days and after one hundred seventy-five (175) days of hire.~~

~~The District may provide information received as a result of a fingerprint check required by section 15-512 to any other school district if requested to do so by the person who was the subject of the fingerprint check or communicate to any school district if requested to do so by the person who applied for a fingerprint clearance card whether the person has been issued or denied a fingerprint clearance card. A copy of any written communication regarding employment must be sent by the employer providing the information to the former employee's last known address.~~

~~Any person who permits unauthorized access to criminal history record information, releases criminal history record information, or procures the release or uses criminal history record information other than in accord with A.R.S. 41-1750 is guilty of a Class 6 felony.~~

~~Adopted: _____~~

~~LEGAL REF.:~~
~~A.R.S.~~
~~13-3716~~
~~15-153~~
~~15-502~~
~~15-505~~
~~15-509~~
~~15-512~~
~~23-211~~
~~23-212~~
~~23-1361~~
~~38-201~~
~~38-481~~
~~41-1756~~

~~CROSS REF.:~~
~~GDFA - Support Staff Qualifications and Requirements~~
~~(fingerprinting requirements)~~

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~~GDF-R ©~~

~~REGULATION~~

~~SUPPORT STAFF HIRING~~

~~Definition~~

~~A background investigation is defined as any communication with an applicant's (or employee's) former employer that concerns the education, training, experience, qualifications, and job performance of the individual and that is used for the purpose of evaluation for employment. Background investigation does not include the results of any state or federal criminal history records check.~~

~~Background Investigation Requirements~~

~~Only persons designated by the Superintendent shall perform background investigations. Prior to contacting former employers or other persons, the background investigator shall:~~

~~A. Ascertain that the standard employment application for the type of position has been completed in full.~~

~~B. Obtain from the individual a consent to background investigation and release as determined by the District.~~

~~C. Make certain that the individual has identified at least two (2) persons from each past employer who can verify basic job information and discuss the individual's work performance and reason for leaving.~~

~~D. Examine the application for a complete work history, accounting for any gaps in employment.~~

~~Two (2) persons should be contacted at each past employer if possible (any exceptions should be documented). Upon making contact, the contacts or the former employer or employer's agent should be provided the following information:~~

~~A. The name and identifying information of the District.~~

~~B. The name of the District representative making the inquiry and how the representative can be contacted.~~

~~C. The name of the former employee and period of employment as indicated by the individual whose background is being investigated.~~

~~D. The position for which the individual has applied, with descriptive information as to the duties, if requested or necessary to understanding of the inquiry.~~

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~~The background investigator shall:~~

~~A. Ask the questions, and complete the background check form(s) as provided by the District.~~

~~B. Make impression notes as necessary based upon the questions and responses, and determine if there may be cause to contact others or make further inquiries based upon the responses.~~

~~C. Provide the information to the Superintendent.~~

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~~EXHIBIT~~

~~SUPPORT STAFF HIRING~~

~~NOTICE OF EMPLOYMENT~~

~~You are hereby notified that, pursuant to action taken at a meeting of the _____ Governing Board held on _____(1)_____, you have been employed for the position of _____(2)_____, beginning _____(3)_____, at the rate of _____(4)_____ per hour. A work schedule for the position is enclosed, which includes information on holidays and nonwork days.~~

~~Your employment may be terminated by the District without advance notice. No legitimate expectation of continued employment is created by this employment, understandings with the Board or its agents, or interpretations of Board policies. You are expected to comply with the requirements of the job description and Board policies while employed by the District.~~

_____ _____

~~Employee Signature~~ ~~Date~~

_____ _____

~~Superintendent Signature~~ ~~Date~~

~~Key to numbers in blanks:~~

~~(1) Date of meeting~~
~~(2) Title of position~~
~~(3) Date that duties begin~~
~~(4) Hourly rate of pay~~

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~~EXHIBIT~~

~~SUPPORT STAFF HIRING~~

~~WAGE NOTICE~~

~~You are hereby notified that, pursuant to action taken at a meeting of the _____ Governing Board held on _____(1)_____, your wages have been set at the rate of _____(2)_____ per hour, effective on _____(3)_____.~~

~~Employee Signature~~ ~~Date~~

~~Superintendent Signature~~ ~~Date~~

~~Key to numbers in blanks:~~
~~(1) Date of meeting~~
~~(2) Hourly rate of pay~~
~~(3) Effective date of hourly pay~~

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~~EXHIBIT~~

~~SUPPORT STAFF HIRING~~

~~CONSENT TO CONDUCT BACKGROUND INVESTIGATION AND RELEASE~~

~~I, _____ [applicant's name], have applied for employment with the _____ School District to work as a _____ [job title]. I understand that in order for the School District to determine my eligibility, qualifications, and suitability for employment, the School District will conduct a background investigation to determine if I am to be considered for an offer of employment. This investigation may include asking my current employer, any former employer, and any educational institution I have attended about my education, training, experience, qualifications, job performance, professional conduct, and evaluations, as well as confirming my dates of employment or enrollment, position(s) held, reason(s) for leaving employment, whether I could be rehired, reasons for not rehiring (if applicable), and similar information.~~

~~I hereby give my consent for any employer or educational institution to release any information requested in connection with this background investigation.~~

~~According to the Family Educational Rights and Privacy Act, I understand that I have a right to see most education records that are maintained by any educational institution.~~

~~In light of the preceding paragraph, I waive _____/do not waive _____ (initial only one [1]) my right to see any written reference or other information provided to the School District by any educational institution.~~

~~According to Arizona Revised Statutes Section 23-1361, any employer that provides a written communication to the School District regarding my current or past employment must send me a copy at my last known address. I acknowledge that some employers are unwilling to provide factual written references concerning a current or past employee unless they may do so confidentially, without revealing the references to the employee, and that the School District will not further consider my application if it cannot complete its background investigation.~~

~~In light of the preceding paragraph, I waive _____/do not waive _____ (initial only one [1]) my right to receive a copy of any written communication furnished to the School District by any employer.~~

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~~Whether or not I have waived my right to see or to receive copies of written references furnished to the School District by employers or educational institutions, I release, hold harmless, and agree not to sue or file any claim of any kind against any current or former employer or educational institution, and any officer or employee of either, that in good faith furnishes written or oral references requested by this School District to complete its background investigation.~~

~~A photocopy or facsimile ("fax") copy of this form that shows my signature shall be as valid as an original.~~

~~DATED this _____ day of _____, 20_____.~~

~~_____ _____~~

~~Witness Applicant~~

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~~EXHIBIT~~

~~SUPPORT STAFF HIRING~~

~~BACKGROUND CHECK FORM~~

~~Applicant~~ _____ ~~Date~~ _____

~~Person contacted~~ _____ ~~Telephone~~ _____

~~Address~~ _____

~~E-mail address~~ _____

~~Relationship to applicant:~~

~~☐ Former employer - position~~ _____

~~District, business, or other entity~~ _____

~~☐ Personal reference~~

~~Method of contact: ☐ Telephone ☐ Letter ☐ Other~~ _____

~~QUESTIONS FOR EMPLOYERS~~

~~Dates of employment~~ _____

~~Position held~~ _____

~~Final rate of pay~~ _____

~~Was the person reliable?~~ _____ ~~If no, explain~~ _____

~~Was the person satisfactory?~~ _____ ~~If no, explain~~ _____

~~Any concern about the person being late to work without authorization?~~ _____

~~If yes, explain~~ _____

~~Any concern with abuse of leave policies (such as sick leave or personal leave)?~~ _____

~~If yes, explain~~ _____

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~~Any difficulty establishing communication and rapport with children?~~ _____

~~If yes, explain~~ _____

~~Any difficulties in establishing communication and rapport with supervisors, parents, or community members?~~ _____

~~If yes, explain~~ _____

~~Did the person ever receive a written counseling statement, letter of direction, or reprimand?~~ _____

~~If yes, describe~~ _____

~~Did the District ever consider taking action or take action to suspend, decline to renew, or dismiss the employee?~~ _____

~~If yes, describe~~ _____

~~Was there ever an allegation or complaint about:~~

~~Abusive language?~~ _____

~~Insulting or derogatory comments?~~ _____

~~Inappropriate contact with a child?~~ _____

~~Verbal or physical contact of a sexual nature?~~ _____

~~Dishonesty?~~ _____

~~Substance abuse?~~ _____

~~Failure to provide adequate supervision?~~ _____

~~Failure to follow reasonable directions or instructions?~~ _____

~~If yes on any of the above, get explanation~~ _____

_____

~~Was the person ever involved in an incident that resulted in injury to an adult or child?~~ _____

~~If yes, explain~~ _____

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~~Would you rehire this person?~~ _____

_____

_____

~~Can you identify anyone else who could provide relevant information regarding the applicant's fitness for employment?~~ _____

_____

_____

~~Is there any other information I have not asked about that would help us determine this person's eligibility, qualifications, and suitability for employment with our District?~~ _____

_____

_____

~~QUESTIONS FOR PERSONAL REFERENCE~~

~~How long have you known the applicant?~~ _____

~~What is the nature of your relationship?~~ _____

~~Why do you think the applicant would be a good choice for this position?~~

_____

_____

~~Do you know of any reasons that could prevent the applicant from fulfilling the functions of the position?~~ _____

_____

_____

~~Background check form completed by~~ _____

~~Date completed~~ _____

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~~EXHIBIT~~

~~SUPPORT STAFF HIRING~~

~~PROCEDURES AND PRACTICES FOR EMPLOYMENT AUTHORIZATION AND EMPLOYMENT ELIGIBILITY VERIFICATION~~

~~*Anti-Discrimination Notice*. It is illegal to discriminate against any individual (other than an alien not authorized to work in the U.S.) in hiring, discharging, or recruiting or referring for a fee because of that individual's national origin or citizenship status. It is illegal to discriminate against work eligible individuals. Employers cannot specify which document(s) they will accept from an employee. The refusal to hire an individual because of a future expiration date may also constitute illegal discrimination.~~

~~Employment Authorization Procedure~~

~~Arizona schools must use the federal government's Basic Pilot Program to verify the employment authorization of all newly hired employees.~~

~~The Department of Homeland Security's (DHS) U.S. Citizenship and Immigration Services Bureau (USCIS) and the Social Security Administration (SSA) are jointly conducting E-Verify, formerly known as the Basic Pilot. E-Verify involves verification checks of the SSA and DHS databases, using an automated system to verify the employment authorization of all newly hired employees.~~

~~There are four (4) types of access to E-Verify: As an employer, as a designated agent for employers, as a multi-location corporate administrator, or through a web service.~~

~~Users can access the web-based access methods using any Internet-capable Windows based personal computer and a web browser of Internet Explorer 5.5 or Netscape 4.7 or higher (with the exception of Netscape 7.0).~~

~~To participate, an employer must register online and accept the electronic Memorandum of Understanding (MOU) that sets forth the responsibilities of the SSA, USCIS and the employer.~~

~~The following e-mail address will allow navigation to both instructions and forms for the I-9 for verifying the identity and employment authorization of individuals hired for employment in the United States:~~

~~https://www.uscis.gov/i-9~~

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~~Form I-9 may be completed as soon as the employer has offered the individual a job and the individual has accepted the offer. Each newly hired employee must complete and sign Section 1 of Form I-9 no later than his or her first day of employment.~~

~~If you need assistance in completing the registration process or need additional information relating to E-Verify, please call the Office of Verification toll free at 1-888-464-4218.~~

~~I-9 Form Completion~~

~~The Immigration Reform and Control Act of 1986 (IRCA) requires that all new employees, both regular and casual, establish their eligibility for employment in the United States. This federal law applies to U.S. citizens as well as to foreign nationals.~~

~~The Employment Eligibility Verification (Form I-9) must be completed as follows:~~

~~Section 1. Employee Information and Attestation~~

~~Employees must complete and sign Section 1 of Form I-9 no later than the first day of employment, but not before accepting a job offer.)~~

~~Section 2. Employer or Authorized Representative Review and Verification~~

~~Employers or their authorized representative must complete and sign Section 2 within three (3) business days of the employee's first day of employment.~~

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ADVISORY 1032

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~~SUPPORT STAFF QUALIFICATIONS AND REQUIREMENTS~~

~~(Fingerprinting Requirements)~~

~~All newly hired noncertificated District personnel - and personnel who are not paid employees of the District and who are not either the parents or the guardians of students who attend school in the District but who are required or allowed to provide services directly to students without the supervision of a certificated employee - shall be fingerprinted as a condition of employment, except for the following:~~

> ~~A. Personnel who are required as a condition of licensing to be fingerprinted if the license is required for employment.~~
>
> ~~B. Personnel who were previously employed by the District and who reestablished employment with the District within one (1) year after the date that the employee terminated employment with the District.~~

~~The School District may require noncertificated personnel and personnel who are not paid employees of the School District and who are not either the parent or the guardian of a pupil who attends school in the School District but who are required or allowed to provide services directly to pupils without the supervision of a certificated employee to obtain a fingerprint clearance card as a condition of employment.~~

~~For the purposes of this policy, supervision means under the direction of and, except for brief periods of time during a school day or a school activity, within sight of a certificated employee when providing direct services to students.~~

~~If the School District does not require a fingerprint clearance card as a condition of employment, noncertificated personnel and personnel who are not paid employees of the School District and who are not either the parent or the guardian of a pupil who attends school in the School District but who are required or allowed to provide services directly to pupils without the supervision of a certificated employee may apply for a fingerprint clearance card. A school district may release the results of a background check or communicate whether the person has been issued or denied a fingerprint clearance card to another school district for employment purposes.~~

~~The District may fingerprint or require any other employee of the District to obtain a fingerprint clearance card, whether paid or not, or any other applicant for employment with the School District not otherwise required by law. The District may not charge the costs of the fingerprint check or fingerprint clearance card to the fingerprinted applicant or nonpaid employee.~~

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~~The candidate's fingerprints shall be submitted, along with the form prescribed in GDFA-E, within twenty (20) days after being selected. The form shall be considered a part of the application for employment. The District may terminate an employee if the information on the affidavit required by A.R.S. 15-512 is inconsistent with information received from the fingerprint check or the information received in connection with a fingerprint clearance card application.~~

~~***School Bus Drivers*** – An applicant shall submit an Identity Verified Fingerprint Card as described in A.R.S. 15-106 that the Department of Public Safety shall use to process the fingerprint clearance card as outlined in A.R.S. 15-106. A person who is issued a school bus driver certificate shall maintain a valid Identity Verified Fingerprint Clearance Card for the duration of any school bus driver certification period.~~

~~The District will assume the cost of fingerprint checks or fingerprint clearance card applications but will assess the employee for charges incurred. Personnel who are not paid employees will not be charged for fingerprint costs.~~

~~Individuals shall certify on the prescribed notarized forms whether they are awaiting trial on or have ever been convicted of or admitted in open court or pursuant to a plea agreement committing any of the following criminal offenses in Arizona or similar offenses in any other jurisdiction, including a charge or conviction that has been vacated, set aside or expunged:~~

~~A. Sexual abuse of a minor.~~

~~B. Incest.~~

~~C. First- or second-degree murder.~~

~~D. Kidnapping.~~

~~E. Arson.~~

~~F. Sexual assault.~~

~~G. Sexual exploitation of a minor.~~

~~H. Felony offenses involving contributing to the delinquency of a minor.~~

~~I. Commercial sexual exploitation of a minor.~~

~~J. Felony offenses involving sale, distribution, or transportation of, offer to sell, transport, or distribute, or conspiracy to sell, transport, or distribute marijuana or dangerous or narcotic drugs.~~

~~K. Felony offenses involving the possession or use of marijuana, dangerous drugs, or narcotic drugs.~~

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~~L. Misdemeanor offenses involving the possession or use of marijuana or dangerous drugs.~~

~~M. Burglary in the first degree.~~

~~N. Burglary in the second or third degree.~~

~~O. Aggravated or armed robbery.~~

~~P. Robbery.~~

~~Q. A dangerous crime against children as defined in A.R.S. 13-705.~~

~~R. Child abuse.~~

~~S. Sexual conduct with a minor.~~

~~T. Molestation of a child.~~

~~U. Manslaughter.~~

~~V. Aggravated assault.~~

~~W. Assault.~~

~~X. Exploitation of minors involving drug offenses.~~

~~Y. Sexual abuse under A.R.S. 13-1404 or sexual assault under 13-1406 in which the victim was a minor.~~

~~Z. An act committed in another state or territory that if committed in this state would have been subject to disclosure under Q and Y above.~~

~~AA. Any crime that requires the person to register as a sex offender pursuant to A.R.S. 13-3821.~~

~~AB. A preparatory offense as prescribed in A.R.S. 13-1001 of any offense that is subject to disclosure under Q, S, Y, Z, or AA above.~~

~~A person who makes a false statement, representation, or certification in any application for employment with the School District is guilty of a Class 3 misdemeanor.~~

~~The District may refuse to hire or may review or terminate personnel who have been convicted of or admitted committing any of the criminal offenses above or a similar offense in another jurisdiction. In conducting a review, the Governing Board shall utilize the guidelines, including the list of offenses that are not subject to review, as prescribed by the State Board of Education pursuant to A.R.S. 15-534. In considering whether to hire or terminate the employment of a person, the Governing Board shall take into account the factors listed in A.R.S. 15-512.~~

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~~When considering termination of an employee pursuant to A.R.S. 15-512, a hearing shall be held to determine whether a person already employed shall be terminated.~~

~~The Superintendent shall develop and implement procedures that include the following in the employment process:~~

~~A. Provide for fingerprinting of employees covered under this policy and A.R.S. 15-512.~~

~~B. Provide for fingerprint checks pursuant to A.R.S. 41-1750.~~

~~C. Provide for properly assessing employees for fingerprint checks and depositing said funds with the county treasurer.~~

~~Adopted: _____~~

~~LEGAL REF.:~~
~~A.R.S.~~
~~13-705~~
~~15-106~~
~~15-509~~
~~15-512~~
~~15-534~~
~~23-1361~~
~~41-1750~~

~~CROSS REF.:~~
~~EEAEA - Bus Driver Requirements, Training, and Responsibilities~~
~~GDF - Support Staff Hiring~~
~~GDG - Part-Time and Substitute Support Staff Employment~~
~~JLIA - Supervision of Students~~

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~~EXHIBIT~~

~~SUPPORT STAFF QUALIFICATIONS AND REQUIREMENTS~~

~~_____ _____~~
~~Name (typed or printed) Position~~

~~I, _____, being duly sworn, do hereby certify that I have never been convicted of or admitted in open court or pursuant to a plea agreement committing, and am not now awaiting trial for committing, any of the following criminal offenses in the state of Arizona or similar offenses in any other jurisdiction, including a charge or conviction that has been vacated, set aside or expunged:~~

~~A. Sexual abuse of a minor.~~

~~B. Incest.~~

~~C. First- or second-degree murder.~~

~~D. Kidnapping.~~

~~E. Arson.~~

~~F. Sexual assault.~~

~~G. Sexual exploitation of a minor.~~

~~H. Felony offenses involving contributing to the delinquency of a minor.~~

~~I. Commercial sexual exploitation of a minor.~~

~~J. Felony offenses involving sale, distribution, or transportation of, offer to sell, transport, or distribute, or conspiracy to sell, transport, or distribute marijuana or dangerous or narcotic drugs.~~

~~K. Felony offenses involving the possession or use of marijuana, dangerous drugs, or narcotic drugs.~~

~~L. Misdemeanor offenses involving the possession or use of marijuana or dangerous drugs.~~

~~M. Burglary in the first degree.~~

~~N. Burglary in the second or third degree.~~

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~~O. Aggravated or armed robbery.~~

~~P. Robbery.~~

~~Q. A dangerous crime against children as defined in A.R.S. 13-705.~~

~~R. Child abuse.~~

~~S. Sexual conduct with a minor.~~

~~T. Molestation of a child.~~

~~U. Manslaughter.~~

~~V. Aggravated assault.~~

~~W. Assault.~~

~~X. Exploitation of minors involving drug offenses.~~

~~Y. Sexual abuse under A.R.S. 13-1404 or sexual assault under 13-1406 in which the victim was a minor.~~

~~Z. An act committed in another state or territory that if committed in this state would have been subject to disclosure under Q and Y above.~~

~~AA. Any crime that requires the person to register as a sex offender pursuant to A.R.S. 13-3821.~~

~~AB. A preparatory offense as prescribed in A.R.S. 13-1001 of any offense that is subject to disclosure under Q, S, Y, Z, or AA above.~~

_____ _____

~~Employee signature~~ ~~Date signed~~

~~Subscribed, sworn to, and acknowledged before me by~~ _____

_____, ~~this~~ _____ ~~day of~~ _____, ~~20~~_____,

~~in~~ _____ ~~County, Arizona.~~

~~My Commission Expires~~

_____ _____

~~Notary Public~~

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ADVISORY 1033

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~~PART - TIME AND SUBSTITUTE SUPPORT STAFF EMPLOYMENT~~

~~The Superintendent may employ, when conditions warrant, temporary or part-time personnel on a per diem or time card basis. This authority is subject to the following conditions:~~

~~A. Continued employment of any such person shall be subject to confirmation and approval by the Board at its next official meeting; however, employment shall not be recommended to the Board prior to satisfactory completion of any pending fingerprint check.~~

~~B. The employee shall be hired on a per diem basis and shall be compensated in accordance with the requirements and limitations of existing contracts that cover similar positions or employees.~~

~~C. In addition to the conditions set forth above, the temporary assignment of a person to a supervisory or administrative position shall be preceded by notification to the Board. The Superintendent will detail the circumstances that created the need for the part-time employment.~~

~~Adopted: _____~~

~~LEGAL REF.:~~
~~A.R.S.~~
~~15-502~~
~~23-1361~~

~~CROSS REF.:~~
~~GDF - Support Staff Hiring~~
~~GDFA - Support Staff Qualifications and Requirements~~
~~(fingerprinting requirements)~~

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~~SUPPORT STAFF~~
~~ASSIGNMENTS AND TRANSFERS~~

~~Assignments~~

~~The Superintendent will determine all support staff assignments.~~

~~Support staff shall be assigned based on the needs of the District, on their qualifications, and on their expressed desires. When it is not possible to meet all three (3) conditions, an employee shall be assigned first in accordance with the needs of the District, second where the Superintendent determines the employee is most qualified to serve, and third as to the expressed preference of the employee.~~

~~Assignments may be changed to serve the best interests of the District.~~

~~Transfers/Reassignments~~

~~Staff members may apply for transfer or reassignment whether or not a vacancy exists.~~

~~The transfer/reassignment of support staff members will be based on the needs of the District, employee qualifications, and the employee's expressed desires. When it is not possible to meet all three (3) conditions, an employee shall be transferred/reassigned first in accordance with the needs of the District, second where the Superintendent determines the employee is most qualified to serve, and third as to the expressed preference of the employee.~~

~~The resolution of any conflicts over the need for a transfer shall be based on what is best for the instructional program, the needs of the students, and the overall needs of the District as defined by the Superintendent.~~

~~The above applies to transfers/reassignments within the same job classification and pay grade. Transfer/reassignment of an employee to a position of greater or lesser pay requires Board approval.~~

~~Adopted: _____~~

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~~SUPPORT STAFF~~
~~SCHEDULES AND CALENDARS~~

~~All support staff employees shall report to their duty stations on time each workday and shall, as scheduled, be available there until the designated time(s) they are scheduled to leave.~~

~~Adopted: _____~~

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~~SUPPORT STAFF WORKLOAD~~

~~The normal workweek for support staff personnel will not exceed forty (40) hours per week. Typically the week will be based on eight (8) hours per day, five (5) days per week; however, the Superintendent may designate other workweek structures to meet varying conditions and needs of the District. Employees will be notified at least one (1) week in advance of any modification to the workweek plan.~~

~~Individual employee work schedules will be based on the position held by the respective employees and on District needs as identified during the employment process.~~

~~For the purpose of calculating regular and overtime hours in accordance with wage and hour requirements, the District's designated workweek shall begin at 12:01 a.m. Sunday and conclude at 12:00 midnight the following Saturday.~~

~~An employee may work overtime, provided that advance authorization is obtained from the supervisor in charge or, in the case of an emergency, authorization is obtained immediately upon completion of the work or as soon thereafter as practicable.~~

~~Adopted: _____~~

~~LEGAL REF.:~~
~~A.R.S.~~
~~23-391~~
~~Arizona Constitution, Article 18, Section 1~~
~~29 U.S.C. 207, Fair Labor Standards Act~~
~~29 C.F.R. 516 *et seq.*, Fair Labor Standards Act~~

~~CROSS REF.:~~
~~GDBC - Support Staff Supplementary Pay/Overtime~~

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~~REGULATION~~

~~SUPPORT STAFF WORKLOAD~~

~~(Fair Labor Standards Act: Overtime Compensation)~~

~~Nonexempt employees who work more than forty (40) hours per week shall be awarded "compensatory time" at the rate of one and one-half (1 1/2) hours for each hour of overtime work. In cases of emergency, when the employee cannot be immediately released for this time and one-half compensation, the Superintendent will make the decision as to paying the employee at the rate of time and one-half or having the employee take the time off at a future date. The hours must be approved by the immediate supervisor before an employee works overtime or, in the case of an emergency, immediately upon completion of the work or as soon thereafter as possible.~~

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~~SUPPORT STAFF MEETINGS~~

~~The Superintendent will arrange for and hold staff meetings as the need may arise. This authority may be delegated to the school principals or supervisor(s), who may hold such meetings on a regularly scheduled basis or as the need arises.~~

~~All appropriate staff members are required to attend any such meeting(s) unless officially excused.~~

~~Adopted: _____~~

~~LEGAL REF.:~~
~~A.R.S.~~
~~15-321~~
~~15-341~~

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~~SUPERVISION OF SUPPORT STAFF MEMBERS~~

~~The supervisor(s) of the various departments or divisions shall be responsible for the supervision of personnel assigned to these areas and shall provide the necessary orientation to new employees and in-service training for all employees under their supervision.~~

~~All other support staff employees shall be under the supervision of the administrative heads of the units to which the employees are assigned. The administrative head shall be responsible for the necessary orientation of new employees and shall provide in-service training as needed.~~

~~Supervision shall include evaluation of the employee.~~

~~Adopted: _____~~

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~~EVALUATION OF SUPPORT STAFF MEMBERS~~

~~All support personnel shall be evaluated by the appropriate supervisor or administrator. A written evaluation of effectiveness of each support staff member shall be completed during the first year of employment and not later than ninety (90) days after the first day of work. A second first-year evaluation will be not later than the anniversary date of employment. At least once each year thereafter, an evaluation will be conducted. The evaluation will be used to increase job proficiency and for recommending continued employment.~~

~~Adopted: _____~~

~~LEGAL REF.:~~
~~A.R.S.~~
~~15-341~~
~~15-1326~~

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~~EXHIBIT~~

~~EVALUATION OF SUPPORT STAFF MEMBERS~~

~~Definition of Rating Scale Terms~~

~~1 = Outstanding~~

~~A. Performance exceeds the requirements of the position.~~

~~B. Displays high degree of self-motivation.~~

~~C. Consistently generates output of superior quality.~~

~~2 = Satisfactory~~

~~A. Performance is adequate for the requirement of the position; meets expectations of the job.~~

~~B. Self-motivation confined to accomplishing assigned tasks.~~

~~C. Generates output of acceptable quality.~~

~~3 = Improvement needed~~

~~A. Performance is not of the quality expected of the position; frequently falls short of job expectations.~~

~~B. Frequently lacks motivation to complete assigned tasks.~~

~~C. Frequently generates output of poor quality.~~

~~4 = Unsatisfactory~~

~~A. Performance is definitely inadequate for the position; consistently falls short of job expectations.~~

~~B. Lacks self-motivation.~~

~~C. Consistently generates output of inferior quality.~~

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~~EXHIBIT~~

~~EVALUATION OF SUPPORT STAFF MEMBERS~~

~~PERFORMANCE RATING REPORT~~

~~Employee _____ Department _____~~

~~Supervisor _____ Date of rating _____~~

~~*Rating scale:*~~
~~*1 = outstanding 2 = satisfactory 3 = improvement needed 4 = unsatisfactory*~~

~~**1 2 3 4 RATING FACTORS:**~~

~~☐ ☐ ☐ ☐ 1. ***Quality of work:*** The ability to produce work that satisfies or surpasses job requirements. Consider accuracy, completeness, thoroughness, neatness of work.~~

~~☐ ☐ ☐ ☐ 2. ***Quantity of work:*** Volume or amount of work done.~~

~~☐ ☐ ☐ ☐ 3. ***Knowledge:*** Knowledge of methods, materials, objectives, and other fundamental information skills.~~

~~☐ ☐ ☐ ☐ 4. ***Adaptability:*** Ability to learn, perform under changes and in emergencies, grasp detail, comprehend differences between important and trivial.~~

~~☐ ☐ ☐ ☐ 5. ***Work habits:*** Organization of work, care of equipment, safety, industry.~~

~~☐ ☐ ☐ ☐ 6. ***Working relationship with students and other employees:*** Ability to get along with the students and other employees.~~

~~☐ ☐ ☐ ☐ 7. ***Dependability:*** Degree to which employee can be relied upon to do the job without close supervision. Punctuality, attendance on the job.~~

~~☐ ☐ ☐ ☐ 8. ***Attitude:*** Interest in work, willingness to meet job requirements and accept suggestions, loyalty to the organization, ethical conduct.~~

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~~☐ ☐ ☐ ☐ 9. ***Personal fitness:*** Physical capacity, appearance, personal habits.~~

~~☐ ☐ ☐ ☐ 10. ***Judgment:*** Soundness of decisions, common sense.~~

~~☐ ☐ ☐ ☐ **OVERALL RATING** (average): Should reflect the above ratings.~~

~~Number of days absent for any reason _____ total points_____.~~

~~**Comments:**~~

~~1. What are the employee's strengths? ("Outstanding" ratings must be explained in this space.)~~

_____

_____

_____

~~2. What are the employee's weaknesses? ("Unsatisfactory" and "Improvement Needed" must be explained in this space.)~~

_____

_____

_____

~~3. General comments:~~

_____

_____

_____

~~**I have discussed this performance rating report with the evaluator.**~~

~~Employee's signature _____ Date _____~~

~~Evaluator's signature _____ Date _____~~

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~~SUPPORT STAFF PROMOTIONS AND RECLASSIFICATION~~

~~The Superintendent will fill positions of increased responsibility with the best available candidates. Candidates will be considered from both within and outside the District.~~

~~A change in assignment shall be considered a promotion to which the job classification or pay grade is greater and shall require Board approval.~~

~~Adopted: _____~~

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~~SUPPORT STAFF~~
~~REDUCTION IN FORCE~~

~~In the event the Board decides to release support staff members, the following guidelines will be in effect:~~

~~A. Normal attrition due to terminations will be relied upon as the first means of reducing the staff.~~

~~B. If attrition does not accomplish the required reduction in the staff, the Superintendent shall submit to the Board recommendations for the termination of specific staff members. The criteria used in formulating these recommendations shall include, but shall not be limited to:~~

~~1. Qualifications of staff members to accomplish the District's program.~~

~~2. Overall experience, training, and ability.~~

~~3. Past contributions to the program of the District.~~

~~4. All other factors being equal, length of service in the District.~~

~~Criteria for selection of staff members to be released will be applied separately to employees within specialty categories.~~

~~Personnel to be released shall be notified of such release as soon as practical.~~

~~Adopted: _____~~

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~~RESIGNATION OF~~
~~SUPPORT STAFF MEMBERS~~

~~Employees voluntarily terminating their service with the District are expected to give advance notice of not less than ten (10) working days. This notice should be submitted to the supervisor in writing and should specify both the last day of work and the reason for terminating. Authorized unused vacation credit will be paid to employees with the last paycheck.~~

~~Adopted: _____~~

~~LEGAL REF.:~~
~~A.R.S.~~
~~23-352~~
~~23-353~~

~~CROSS REF.:~~
~~GDL - Support Staff Workload~~

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~~DISCIPLINE, SUSPENSION, AND DISMISSAL OF SUPPORT STAFF MEMBERS~~

~~(Discipline)~~

~~Minor Disciplinary Action~~

~~A support staff member may be disciplined for any conduct that, in the judgment of the District, is inappropriate. Minor disciplinary action includes, without limitation thereto, verbal or written reprimands, suspension with pay, or suspension without pay for a period of five (5) days or less. Minor disciplinary action shall be imposed by the support staff member's supervisor. A support staff member who wishes to object to a minor disciplinary action shall submit a written complaint to the supervisor's superior within five (5) work days of receiving notice of the disciplinary action. The supervisor's superior will review the complaint and may confer with the support staff member, the supervisor, and such other persons as the supervisor's superior deems necessary. The decision of the supervisor's superior will be final.~~

~~Suspension without Pay for More than Five Days~~

~~***At-will employees.*** The employment of an at-will employee may be suspended without pay for a period of more than five (5) days by action of the Superintendent for any conduct by the employee that, in the judgment of the Superintendent, is inappropriate. Before suspending an at-will employee, the Superintendent will inform the employee of intent to suspend the employee and will give the employee an informal opportunity to explain why, in the employee's opinion, the suspension should not be imposed. The Superintendent's decision will be final.~~

~~***Term employees.*** The employment of a term employee may be suspended without pay for a period of more than five (5) days by action of the Superintendent for any conduct that, in the judgment of the Superintendent, is inappropriate. If the Superintendent intends to suspend a term employee without pay for more than five (5) days, the notice and hearing procedures prescribed for the dismissal of term employees shall be followed, except that the hearing officer shall be designated by the Superintendent and the findings of the hearing officer shall be a final decision. At the Superintendent's option, the Superintendent may request that the Governing Board act as the hearing officer. If the hearing officer or the Governing Board finds that there is not cause to suspend the employee without pay for more than five (5) days, the Superintendent may, after reviewing the findings, impose minor disciplinary action.~~

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~~**Dismissal**~~

~~***At-will employees.*** The employment of an at-will employee may be terminated by action of the Governing Board for any reason, or for no reason, with or without advance notice, as the Governing Board desires. If the Superintendent recommends that the Governing Board terminate an at-will employee, the recommendation shall be submitted to the Governing Board in writing and a copy of the recommendation shall be delivered to the employee. The at-will employee may submit to the Governing Board prior to the Board meeting a written response to the recommendation. If the at-will employee chooses to attend the Board meeting when the recommendation is considered, the Governing Board may, in its discretion, permit the employee to address the Governing Board concerning only the recommendation.~~

~~***Term employees.*** The employment of a term employee may be terminated for cause by action of the Governing Board at any time prior to the expiration of the term of employment. For the purposes of this provision, cause means any conduct that, in the judgment of the District, is detrimental to the interests of the District or its personnel or students and shall include, without limitation thereto, the following:~~

~~A. Absence without leave~~	~~J. Incompetence or inefficiency~~
~~B. Abuse of leave~~	~~K. Insubordination~~
~~C. Alcohol or drug impairment~~	~~L. Neglect of duty~~
~~D. Child abuse or molestation~~	~~M. Unauthorized possession of a weapon on school grounds~~
~~E. Discourteous treatment of the public~~	~~N. Unauthorized use of school property~~
~~F. Dishonesty~~	~~O. Unlawful conduct~~
~~G. Excessive absenteeism~~	~~P. Use of illegal drugs~~
~~H. Fraud in securing employment~~	~~Q. Violation of a directive of a supervisor~~
~~I. Improper attitude~~	~~R. Violation of a District policy or regulation~~

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~~If the Superintendent recommends termination of a term employee, a copy of the recommendation shall be delivered to the employee. The employee may request a hearing within five (5) work days after receipt of the recommendation. If a hearing is requested, the Superintendent shall deliver a written notice of the time and place of the hearing and a written statement that gives the reasons for the recommendation, a list of persons whom the Superintendent expects to testify in support of the recommendation (together with a brief summary of what each person is expected to say), and a general description of any other evidence that the Superintendent at the time believes may be presented at the hearing in support of the recommendation.~~

~~The hearing shall be conducted by the Governing Board or by a person designated by the Governing Board within not less than five (5) work days and not more than thirty (30) calendar days after a request for hearing is submitted by the employee. The date of the hearing may be postponed by stipulation of the employee and the District, or by and in the sole discretion of the Governing Board or the hearing officer, or at the request of the aggrieved employee or the District for such reason or reasons as the Governing Board or hearing officer may deem appropriate.~~

~~The employee may be represented at the hearing by counsel, at the employee's expense. The employee shall have the opportunity to present witnesses and to cross-examine any witnesses presented by the District. Formal rules of evidence shall not apply. A record of the hearing shall be made by use of a mechanical device.~~

~~If a hearing officer is used, the hearing officer shall prepare a written statement of findings as to whether there is cause for termination of the employee and submit it to the Governing Board within ten (10) work days after the conclusion of the hearing. The Governing Board shall review the written statement and, if desired, the record, and the Governing Board's decision whether to accept the findings and whether to terminate employment or to impose other discipline shall be a final decision.~~

~~If the Governing Board conducts the hearing, it shall render a decision within ten (10) days after the conclusion of the hearing.~~

~~General Matters~~

~~Failure to object to a disciplinary action or take other action within the time limitations set forth in this policy shall mean that the employee does not wish to pursue the matter further. Complaints filed after the expiration of the applicable time limitation will not be considered.~~

~~The filing or pendency of a complaint or other form of grievance pursuant to this policy shall in no way limit or delay action taken by the supervisor or the Superintendent authorized by this policy to take such action.~~

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~~A complaint relating to minor disciplinary action, suspension without pay for more than five (5) days, or dismissal shall not be processed as a grievance.~~

~~None of the procedures of this policy shall alter the status of an at-will employee.~~

~~This policy does not apply to:~~

~~A. Any administrative recommendation or Governing Board action, discussion, or consideration involving the nonrenewal of a term employee.~~

~~B. Ratings, comments, and recommendations made in the course of an evaluation of a support staff member.~~

~~C. The decision of the Superintendent to place a support staff member on administrative leave.~~

~~D. Counseling of or directives to a support staff member regarding future conduct.~~

~~Adopted: _____~~

~~LEGAL REF.:~~
~~A.R.S.~~
~~13-2911~~
~~15-153~~
~~15-341~~
~~15-502~~
~~41-773~~

~~CROSS REF.:~~
~~DKA - Payroll Procedures/Schedules~~

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ADVISORY 1044

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~~NONSCHOOL EMPLOYMENT BY SUPPORT STAFF MEMBERS~~

~~A regular, full-time employee's position in the District shall be given precedence over any type of outside work or self-employment. Employees are free to carry on outside work or self-employment projects as long as no District facilities, equipment, or school(s) are used, except as provided by policy, and the outside work or self-employment does not interfere with the employees' performance of District-assigned duties.~~

~~The outside work or self-employment by a staff member is of concern to the Board insofar as it may:~~

> ~~A. Prevent the employee from performing assigned responsibilities in an effective manner.~~
>
> ~~B. Be prejudicial to proper effectiveness in the position or compromise the District.~~
>
> ~~C. Raise a question of conflict of interest - for example, where the employee's position in the District permits access to information or other advantage useful to the outside employer.~~

~~Therefore, an employee may not perform any duties related to outside work or self-employment during regular District working hours or during the additional time that is needed to fulfill the responsibilities of the District position. Employees who violate this policy are subject to reprimand, suspension, or termination.~~

~~Adopted: _____~~

~~LEGAL REF.:~~
~~A.R.S.~~
~~15-321~~
~~15-341~~

~~CROSS REF.:~~
~~EDB - Maintenance and Control of Materials and Equipment~~
~~KF - Community Use of School Facilities~~

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VANDALISM AND REPORTING SUSPECTED CRIMES

Vandalism

The Superintendent is authorized to sign a criminal complaint and to press charges against perpetrators of vandalism against school property.

Students who destroy school property through vandalism or arson, or who create a hazard to the safety of other people on school property, may be referred to law enforcement authorities. Such students who are caught vandalizing school property shall be subject to disciplinary action, including but not limited to suspension and expulsion. A conference with the student's parents will be required.

Parents and students shall be made aware that the law provides that parents are liable for the willful destruction of property by a minor in their custody or control.

The District may file suit to recover the cost of vandalism from the student and/or parent(s).

Reporting Suspected Crimes or Incidents

Staff members are to report any suspected crime against a person or property that is a serious offense, involves a deadly weapon or dangerous instrument or ~~that could pose a threat of death or~~ serious physical injury, and any conduct that poses a threat of death or serious physical injury to employees, students or others on school property.

All such reports shall be documented and communicated to the principal or other school administrator in accordance with District procedures. The administrator shall ensure the matter is promptly reported to the Superintendent who shall be responsible for reporting to local law enforcement as required by Governing Board policy and law.

"Serious offense" is defined in A.R.S. 13-706; "deadly weapon," "dangerous instrument," and "serious physical injury" are defined in A.R.S. 13-105. Conduct that is considered to be bullying, harassment or intimidation shall be addressed according to Policy JICK as required in A.R.S. 15-341(A)(36).

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Observed Weapons and Drug-Free School Zone Violations

In addition to the reporting requirements above, and as required by law, any school employee who observes 1) a violation of A.R.S. 13-3102(A)(12) (possession of a deadly weapon on school grounds) or 2) A.R.S. 13-3111 (minor in possession of a firearm) shall immediately report the violation to a school administrator, and the administrator shall immediately report the violation to a peace officer, as required by A.R.S. 15-515.

Any school employee who observes a violation of A.R.S. 13-3411 (drug-free school zone violations) shall immediately report the violation to a school administrator, and the administrator shall immediately report the violation to a peace officer; failure to report as required is unlawful.

Subject to the ~~conditions provided under A.R.S. 8-303~~ requirements of federal law, the school district or charter school ~~is to~~ shall notify the parent or guardian of each student who is involved in a suspected crime or any conduct that is described above~~, subject to the requirements of federal law~~.

~~The District shall post the policies and procedures pertaining to "Reporting Suspected Crimes or Incidents," as developed by the Department of Education, on the District's website to verify that the District has adopted the required policies and procedures.~~

If a peace officer takes a juvenile into temporary custody pursuant to A.R.S. 8-303 on school property, an employee of the school, after consultation with the investigating law enforcement agency to ensure notification would not pose a risk to the juvenile or the investigation, shall immediately notify the juvenile's parents, guardian or custodian of the juvenile's custody. If the juvenile is a ward of the state, the school employee shall notify the Department of Child Safety.

The District shall post the reporting policies and procedures prescribed by A.R.S. 15-153 on the District's website.

If the District maintains an online Manual of policies and procedures, the District may post a link to that manual with a reference to the appropriate policies and procedures.

A person who violates the reporting requirements may be disciplined for violating the policies of the School District Governing Board pursuant to A.R.S. 15-341 and notwithstanding A.R.S. 15-341, may be subject to dismissal. Each school district governing board shall prescribe and enforce policies and procedures that require the School District to maintain a record on any person who is disciplined pursuant to this policy and, on request, shall make that record available to any public school, school district governing board or charter school governing body that is considering hiring that person.

Adopted: Adopted: _____

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LEGAL REF.:
A.R.S.
8-303
12-661
13-105
13-706
13-3102
13-3111
13-3411
15-153
15-341
15-515
15-842

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REGULATION

VANDALISM AND REPORTING SUSPECTED CRIMES

Vandalism Reporting

The principal will establish a system through which students and members of the school community can report any instance of vandalism or suspected vandalism. Each employee of the District shall report to the principal or other administrator every perceived incident of vandalism and, if known, the names of those ~~responsible~~ involved.

Suspected Crimes or Incidents Reporting:

A. Any employee who becomes aware of conduct described in Policy ECAC shall document and report the matter to the principal or other school administrator in accordance with District procedures.

B. The administrator shall ensure the matter is promptly reported to the Superintendent and report to local law enforcement as required by Governing Board policy and law.

C. The administrator shall ensure any required immediate reporting to a peace officer occurs without delay when applicable.

D. Any school employee who observes a violation of A.R.S. 13-3102(A)(12) or A.R.S. 13-3111 on school premises shall immediately report the violation to a school administrator. The administrator shall immediately report the violation to a peace officer.

E. Any school employee who observes a violation of A.R.S. 13-3411 shall immediately report the violation to a school administrator. The administrator shall immediately report the violation to a peace officer.

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ADVISORY 1046

Note: This material is written for informational purposes only, and not as legal advice. You may wish to consult an attorney for further explanation.

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IHAL ©
TEACHING ABOUT RELIGION

Standards pertaining to instruction on the historical study of biblical text may be found in the State Board of Education Standards in history or English arts, or both, as concepts that include the history and literature of the Old Testament era and the history and literature of the New Testament era. The standards do not require that ~~pupils~~ students who do not enroll in the elective course prescribed in this section receive instruction on the historical study of biblical text.

The instructional program of the District may include content in an elective course pertaining to how the Bible has influenced western culture for ~~pupils~~ students in grades nine (9) through twelve (12). A school may offer this course as an online course. The School District may develop a new curriculum or use an existing curriculum that includes teacher~~-~~s' guides and that is currently in use in public schools in this state or in other states. An existing curriculum that is used by a school district shall meet the standards and guidelines prescribed in this section as indicated below:

A. Before a school offers a course under this section, a legal review shall be conducted to ensure that the course complies with the First Amendment to the United States Constitution.

B. A course offered under this section shall be designed to:

1. Familiarize ~~pupils~~ students with the contents, characters, poetry and narratives that are prerequisites to understanding society and culture, including literature, art, music, mores, oratory and public policy.

2. Familiarize ~~pupils~~ students with the following:

a. The contents of the Old Testament and the New Testament.

b. The history recorded by the Old Testament and the New Testament.

c. The literary style and structure of the Old Testament and the New Testament.

d. The influence of the Old Testament and the New Testament on laws, history, government, literature, art, music, customs, morals, values and culture.

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C. A course offered under this section shall follow applicable law and all federal and state guidelines in maintaining religious neutrality and accommodating the diverse religious or nonreligious views, traditions and perspectives of ~~pupils~~ students. This section is not intended to violate any provision of the United States Constitution, the constitution of Arizona or state law or any rules, guidelines or regulations adopted by the United States Department of Education, the State Board of Education or the Arizona Department of Education.

D. A ~~pupil~~ student shall not be required to use a specific translation as the sole text of the Old Testament or the New Testament and may use as the basic textbook a different translation of the Old Testament or the New Testament from that chosen by the School District Governing Board or the student~~pupil~~'s teacher.

E. Personnel shall not be assigned to teach a course offered under this section based on a religious or nonreligious test, a profession of faith or lack of faith, or prior or current religious affiliation or a lack of religious affiliation.

F. A teacher who instructs a course offered under this section in its appropriate historical context and in good faith shall be immune from civil liability and disciplinary action pursuant to ~~section~~ A.R.S. 15-535.

This program will conform to all applicable Arizona Revised Statutes and Arizona Administrative Codes. The program~~,~~ and materials used in the elective course~~, and the act of sectarian instruction as referenced in statute~~ are not prohibited under A.R.S. 15-341(~~a~~A)(2), A.R.S. 15-362(~~a~~B)(2), or A.R.S. 15-535 ~~as each are authorized under~~ when offered pursuant to A.R.S. 15-717.01, ~~Bible influence; elective course; requirements; immunity~~ in a neutral, historical, nonsectarian manner.

Prohibited Sectarian Instruction

A teacher who uses sectarian or denominational books or teaches any sectarian doctrine or conducts any religious exercises in school is guilty of unprofessional conduct and his/her certificate shall be revoked. This section shall not be construed to prohibit a teacher from teaching the elective course permitted by A.R.S. 15-717.01.

Adopted: _____

LEGAL REF.:
A.R.S.
15-341
15-362
15-535
15-717.01

IE
Organization of Instruction

The instructional plan shall be divided into (3) levels:

- Elementary School, which shall include grades prekindergarten (PK) thru fifth (5).
- Junior High School, which shall include grades six (6) thru eight (8).
- High School, which shall include grades nine (9) thru twelve (12).

The organizational plan shall be subject to change by the District Governing Board whenever the needs of the students and/or the District change. The District will coordinate and articulate a prekindergarten (PK) thru grade twelve (12) instructional program.

9.D. **Approve the 2025-26 Budget Revision #3 for Joseph City Schools**

District Name Joseph City Unified School District **County** Navajo County **Instructions** **CTD number** 090202000

FY 2026
State of Arizona
School District Annual Expenditure Budget
Districtwide Budget

Revised #3
Version

By the Governing Board

We hereby certify that the Budget for the Fiscal Year 2026 was

Proposed	June 10, 2025
Adopted	July 8, 2025
Revised	May 12, 2026
	Date

District website link of posted budget https://www.jcusd.org/page/budget

Signed Signed

The FY 2026 budget file for the version described above will be uploaded via the School Finance Budget System on ADE's website by May 13, 2026.
Date

Superintendent signature Business Manager signature

Bryan Fields Steven Mills
Superintendent name (typed name) Business Manager name (typed name)

District contact employee: Steven Mills

Telephone: 928-288-3307 Email: stevenm@jcusd.org

Revenues and property taxation

1. Total budgeted revenues for fiscal year 2025 $ 3,272,059
2. Estimated revenues by source for fiscal year 2026 (excluding property taxes)

Local	1000	$	173,844
Intermediate	2000	$	14
State	3000	$	2,659,516
Federal	4000	$	417,861
TOTAL		$	3,251,235

3. **District tax rates for prior and budget fiscal years (A.R.S. §15-903.D.4)**

	Prior FY 2025	Est. Budget FY 2026
Primary Tax Rate:	4.3101	4.2706
Secondary Tax Rates:		
M&O Override	0.7392	0.7447
Special Program Override		
Capital Override		
Class A Bonds		
Class B Bonds		
CTED		
Desegregation		
Total Secondary Tax Rate	0.7392	0.7447

Total budgeted expenditures and aggregate school district budget limit (A.R.S. §15-905.H)

	Budgeted Expenditures	Budgeted Carryforward	Budget Limit
1. Maintenance and Operation Fund (from pages 1, lines 30-31 and 7, line 10)	$ 5,280,035	$ 0	$ 5,280,035
2. Unrestricted Capital Fund (from pages 4, lines 10-11 and 8, line 12)	$ 298,195	$ 0	$ 298,195
3. Federal projects other than Impact Aid (from budget, page 6, Federal Projects, minus 378 [lines 18 and 20])			$ 567,000
4. Total aggregate school district budget limit (sum of lines 1 through 3)			$ 6,145,230

Average teacher salaries (A.R.S. §15-903.E)

1. Average salary of all teachers employed in FY 2026 (budget year)	$ 55,142
2. Average salary of all teachers employed in FY 2025 (prior year)	$ 54,061
3. Increase in average teacher salary from the prior year	$ 1,081
4. Percentage increase	2%

☐ Check this box if your district has no teachers (transporting districts and some CTEDs).

Comments on average salary calculation (Optional):

District name Joseph City Unified School District | County Navajo County | CTD number 090202000 | Version Revised #3

Fund 001 (M&O)

Maintenance and Operation (M&O) Fund

Instructions Expenditures		FTE Prior FY	FTE Budget FY	Salaries 6100	Employee Benefits 6200	Purchased Services 6300, 6400, 6500	Supplies 6600	Other 6800	Totals Prior FY 2025	Totals Budget FY 2026	% Increase/ Decrease	
100 Regular Education												
1000 Instruction	1.	25.18	20.76	1,031,435	289,395	78,120	25,454	5,041	1,767,462	1,429,445	-19.1%	1.
2000 Support Services												
2100 Students	2.	3.15	2.66	171,707	67,722	14,921	2,853	2,094	293,750	259,297	-11.7%	2.
2200 Instructional Staff	3.	2.81	3.01	147,535	51,722	37,950	2,559	3,556	230,754	243,322	5.4%	3.
2300 General Administration	4.	1.30	1.30	82,670	54,651	25,305	41	7,099	98,548	169,766	72.3%	4.
2400 School Administration	5.	3.48	2.88	176,802	43,108	0	7,583	819	199,834	228,312	14.3%	5.
2500 Central Services	6.	4.90	3.80	179,804	64,596	86,424	8,928	21,821	421,435	361,573	-14.2%	6.
2600 Operation & Maintenance of Plant	7.	11.98	13.93	303,587	91,076	465,775	210,456	1,614	1,141,254	1,072,508	-6.0%	7.
2900 Other	8.	0.00	0.00	0	0	0	0	0	0	0	0.0%	8.
3000 Operation of Noninstructional Services	9.	0.19	0.15	400	100	86,350	0	0	10,500	86,850	727.1%	9.
610 School-Sponsored Cocurricular Activities	10.	0.00	0.00	27,627	4,516	0	180	9,545	29,910	41,868	40.0%	10.
620 School-Sponsored Athletics	11.	0.00	0.60	139,700	16,811	17,016	18,024	34,852	145,962	226,403	55.1%	11.
630 Other Instructional Programs	12.	0.00	0.00	0	0	0	0	0	0	0	0.0%	12.
700, 800, 900 Other Programs	13.	0.00	0.00	19,612	656	0	0	0	21,151	20,268	-4.2%	13.
Regular Education Subsection Subtotal (lines 1-13)	14.	52.99	49.09	2,280,879	684,353	811,861	276,078	86,441	4,360,560	4,139,612	-5.1%	14.
200 and 300 Special Education												
1000 Instruction	15.	18.47	14.09	346,660	43,101	0	1,316	0	360,424	391,077	8.5%	15.
2000 Support Services												
2100 Students	16.	2.07	1.70	105,873	15,165	154,768	811	0	276,617	276,617	0.0%	16.
2200 Instructional Staff	17.	0.50	0.50	24,617	813	785	1,190	97	27,502	27,502	0.0%	17.
2300 General Administration	18.	0.00	0.00	0	0	0	0	0	0	0	0.0%	18.
2400 School Administration	19.	0.00	0.00	0	0	0	0	0	0	0	0.0%	19.
2500 Central Services	20.	0.00	0.00	0	0	1,058	0	0	1,058	1,058	0.0%	20.
2600 Operation & Maintenance of Plant	21.	0.00	0.00	0	0	0	0	0	0	0	0.0%	21.
2900 Other	22.	0.00	0.00	0	0	0	0	0	0	0	0.0%	22.
3000 Operation of Noninstructional Services	23.	0.00	0.00	0	0	0	0	0	0	0	0.0%	23.
Subtotal (lines 15-23)	24.	21.04	16.29	477,150	59,079	156,611	3,317	97	665,601	696,254	4.6%	24.
400 Pupil Transportation	25.	0.00	9.65	185,237	42,383	102,106	95,875		321,486	425,601	32.4%	25.
510 Desegregation (from Districtwide Desegregation Budget, page 2, line 44)	26.	0.00	0.00	0	0	0	0	0	0	0	0.0%	26.
530 Dropout Prevention Programs	27.	0.00	0.00						0	0	0.0%	27.
540 Joint Career and Technical Education and Vocational Education Center	28.	0.00	0.00	0	0	0	0	0	0	0	0.0%	28.
550 K-3 Reading Program	29.	0.00		14,854	3,714				18,387	18,568	1.0%	29.
Budgeted expenditures (lines 14, and 24-29)	30.	74.03	75.03	2,958,120	789,529	1,070,578	375,270	86,538	5,366,034	5,280,035.00	-1.6%	30.
Maintained for spending after FY 2026 (budgeted carryforward)	31.									0		31.
Total budget limit expenditures (lines 30-31) (Cannot exceed page 7, line 11)	32.	74.03	75.03	2,958,120	789,529	1,070,578	375,270	86,538	5,366,034	5,280,035	-1.6%	32.

The district has budgeted an amount in the M&O Fund equal to the General Budget Limit as calculated on page 7 of 8.

Instructions

Special education programs by type (M&O Fund Programs 200 and 300)

(A.R.S. §§ 15-761 and 15-903)

	Prior FY	Budget FY	
1. Total all disability classifications	570,752	647,577	1.
2. Gifted Education	0	0	2.
3. Remedial Education	0	0	3.
4. ELL Incremental Costs	0	0	4.
5. ELL Compensatory Instruction	0	0	5.
6. Vocational and Technical Education (non-CTED)	0	5,182	6.
7. Career Education (non-CTED)	0	0	7.
8. Career Technical Education (CTED)	94,849	43,495	8.
9. Total (lines 1 through 8. Must equal total of line 24, page 1)	665,601	696,254	9.
10. IEP required pupil transportation costs coded within Program 400	0	0	10.

Proposed ratios for special education
(A.R.S. §§15-903.E.1 and 15-764.A.5)

Teacher-Pupil 1 to 22
Staff-Pupil 1 to 22

Expenditures budgeted for audit services

M&O Fund - Nonfederal	**6350**	26,500
All Funds - Federal	*6330*	0

FY 2026 Performance Pay (A.R.S. Section 15-920)
Amount Budgeted in M&O Fund for a Performance Pay Component $ -

Do not report budgeted amounts for the Performance Pay Component of the Classroom Site Fund on this line.

Expenditures budgeted in the M&O Fund for food service
Amount budgeted in M&O for Food Service (Fund 001, Function 3100) $ 86,850
(This amount will be used to determine district compliance with state matching requirements pursuant to Code of Federal Regulations (CFR) Title 7, §210.17(a)]

District name Joseph City Unified School District **County** Navajo County **CTD number** 090202000 **Version** Revised #3

Fund 010 (CSF)

Classroom Site Fund (CSF) and CSF Budget Limit (A.R.S. §§ 15-977 and 15-978)

Instructions Expenditures		Salaries 6100	Employee benefits 6200	Purchased services 6300, 6400, 6500	Supplies 6600	Property 6700	Debt service and miscellaneous 6800	Totals Prior FY 2025	Totals Budget FY 2026	% Increase/ Decrease	
1000 Instruction	1.	652,657	217,552					1,149,324	870,209	-24.3%	1.
2100 Support services - students	2.	74,830	14,470	50,035				228,730	139,335	-39.1%	2.
2200 Support services - instructional staff	3.			8,008				0	8,008		3.
2300 Support services - general administration	4.							0	0	0.0%	4.
2500 Central services	5.							0	0	0.0%	5.
3300 Community services Ooerations	6.							0	0	0.0%	6.
4000 Facilities acquisition and construction	7.							0	0		7.
5000 Debt service	8.							0	0		8.
Budgeted expenditures (lines 1-8)	9.	727,487	232,022	58,043	0	0	0	1,378,054	1,017,552	-26.2%	9.
Maintained for spending after FY 2026 (budgeted carryforward)	10.								249,236		10.
Total budget limit expenditures (lines 10-11)	11.	727,487	232,022	58,043	0	0	0	1,378,054	1,266,788	-8.1%	11.

The district has budgeted an amount in Fund 010 equal to the Classroom Site Fund Budget Limit as calculated below.

Classroom Site Fund Budget Limit Calculation

FY 2025 Classroom Site Fund Budget Limit (from FY 2025 latest revised Budget, page 3, line 16)	12.	1,378,054
FY 2025 Actual expenditures (For budget adoption use actual expenditures to date plus estimated expenditures through fiscal year-end.)	13.	586,306
Unexpended Budget Balance (line 12 minus 13)	14.	791,748
Interest earned in the Classroom Site Fund in FY 2025	15.	0
FY 2026 Classroom Site Fund allocation, provided by ADE based on: $842	16.	475,040
Adjustments to FY 2026 Classroom Site Fund Budget Limit (1)	17.	
FY 2026 Classroom Site Fund Budget Limit (Sum of lines 12 through 17) (2)	18.	1,266,788

(1) This line may be used to recapture lost CSF budget capacity that resulted from underbudgeting in prior fiscal years.
(2) The amounts budgeted on line 11 cannot exceed the respective amounts on this line.

District name Joseph City Unified School District | County Navajo County | CTD number 090202000 | Version Revised #3

Fund 610 (UCO)

Unrestricted Capital Outlay (UCO) Fund

Instructions Expenditures		Rentals 6440	Library books, textbooks, & instructional aids (2) 6641-6643	Short-term noninstructional software subscription 6655	Property (2) 6700	Redemption of principal (3) 6831, 6832, 6833	Interest (4) 6841, 6842, 6843, 6850	All other object codes (excluding 6900)	Totals Prior FY 2025	Totals Budget FY 2026	% Increase/ Decrease	
Unrestricted Capital Outlay Override (1)	1.	0	0	0	0	0	0	0	0	0	0.0%	1.
Unrestricted Capital Outlay Fund 610 (6)												
1000 Instruction	2.		61,222		19,322				112,138	80,544	-28.2%	2.
2000 Support Services												
2100, 2200 Students and Instructional Staff	3.		1,085	24,438	1,759				45,280	27,282	-39.7%	3.
2300, 2400, 2500, 2900 Administration	4.			80,717	2,967				74,335	83,684	12.6%	4.
2600 Operation & Maintenance of Plant	5.			703	5,811				1,253	6,514	419.9%	5.
2700 Student Transportation	6.								3,718	0	-100.0%	6.
3000 Operation of Noninstructional Services (5)	7.								0	0	0.0%	7.
4000 Facilities Acquisition and Construction	8.							4,660	0	4,660		8.
5000 Debt Service	9.					78,535	16,976		80,830	95,511	18.2%	9.
Budgeted expenditures (lines 2-9)	10.	0	62,307	105,858	29,859	78,535	16,976	4,660	317,554	298,195	-6.1%	10.
Maintained for spending after FY 2026 (budgeted carryforward)	11.									0		11.
Total budget limit expenditures (lines 10-11) (Cannot exceed page 8, line 12)	12.	0	62,307	105,858	29,859	78,535	16,976	4,660	317,554	298,195	-6.1%	12.

The district has budgeted an amount in the UCO Fund equal to the Unrestricted Capital Budget Limit as calculated on Page 8 of 8.

(1) Amounts in the Unrestricted Capital Outlay Override line 1 above must be included in the appropriate individual line items for Fund 610 and in the budget year total column.

(2) Detail by object code:

	Unrestricted Capital Outlay
6641 Library Books	$ 1,200
6642 Textbooks	9,500
6643 Instructional Aids	51,607
673X Furniture and Equipment	24,859
673X Vehicles	0
673X Tech Hardware & Software	5,000

(5) Expenditures budgeted in Unrestricted Capital Outlay (UCO) Fund for food service

Enter the amount budgeted in UCO for food service [amount will be used to determine district compliance with state matching requirements pursuant to CFR Title 7, §210.17(a)] _____

(6) Expenditures, if any, budgeted in the Unrestricted Capital Outlay Fund on lines 2-9 for the K-3 Reading Program as described in A.R.S. §15-211 _____

(3) Includes principal on Capital Equity Fund loans of _____, principal on leases of _____, and principal on bonds of _____.

(4) Includes interest on Capital Equity Fund loans of _____, interest on leases of _____, and interest on bonds of _____.

District name Joseph City Unified School District **County** Navajo County **CTD number** 090202000 **Version** Revised #3

Other funds—required capital expenditure detail [(A.R.S. §15-904.(B)]

Instructions Expenditures		Unrestricted Capital Outlay Fund 610		Bond Building Fund 630		New School Facilities Fund 695		Adjacent Ways Fund 620 (2)		
		Prior FY	Budget FY	Prior FY	Budget FY	Prior FY	Budget FY	Prior FY	Budget FY	
Total Fund Expenditures	1.	317,554	298,195	0		0		196,084	187,225	1.
Select Object Codes Detail (1)										
6150 Classified Salaries	2.	0		0		0		0		2.
6200 Employee Benefits	3.	0		0		0		0		3.
6450 Construction Services	4.	0		0		0		196,084	187,225	4.
6655 Short-term Noninstructional Software Subscription	5.									5.
6710 Land and Improvements	6.	0		0		0		0		6.
6720 Buildings and Improvements	7.	0		0		0		0		7.
673X Furniture and Equipment	8.	70,000	24,859	0		0		0		8.
673X Vehicles	9.	50,000	0	0		0		0		9.
673X Technology Hardware & Software	10.	(60,903)	5,000	0		0		0		10.
6831, 6832, 6833 Redemption of Principal	11.	0		0		0		0		11.
6841, 6842, 6843, 6850, 6860 Interest and Debt-Issuance Costs	12.	0		0		0		0		12.
Total (lines 2-12)	13.	59,097	29,859	0	0	0	0	196,084	187,225	13.
Total amounts reported on lines 2-12 above for:										
Renovation	14.	0		0				0		14.
New Construction	15.	0		0		0		0		15.
Other	16.	59,097	29,146	0		0		196,084	187,225	16.
Total (lines 14-16, must equal line 13)	17.	59,097	29,146	0	0	0	0	196,084	187,225	17.

Check line 12

(1) Lines 2-12 may not include all budgeted expenditures of the fund. Total budgeted expenditures for each fund should be included on Line 1.

(2) Amount budgeted on line 1 for the Adjacent Ways Fund that will result in a tax levy in FY 2026 $ -

District name Joseph City Unified School District **County** Navajo County **CTD number** 090202000 **Version** Revised #3

Special projects

Instructions

		FTE		Total all functions		
	Federal projects FTE & expenditures	Prior FY	Budget FY	Prior FY	Budget FY	
1.	100-130 ESEA Title I - Helping Disadvantaged Children	2.57	3.12	207,000	211,431.00	1.
2.	140-150 ESEA Title II - Prof. Dev. and Technology	0.00	0.00	80,000	47,552.00	2.
3.	160 ESEA Title IV - 21st Century Schools	0.00	0.00	0	11,973.00	3.
4.	170-180 ESEA Title V - Promote Informed Parent Choice	0.00	0.00	0	0.00	4.
5.	190 ESEA Title III - Limited Eng. & Immigrant Students	0.00	0.00	0	0.00	5.
6.	200 ESEA Title VII - Indian Education	0.00	0.00	25,000	20,000.00	6.
7.	210 ESEA Title VI - Flexibility and Accountability	0.00	0.00	0	0.00	7.
8.	220 IDEA Part B	2.80	2.26	208,000	190,679.00	8.
9.	230 Johnson-O'Malley	0.02	0.00	4,500	0.00	9.
10.	240 Workforce Investment Act	0.00	0.00	0	0.00	10.
11.	250 AEA - Adult Education	0.00	0.00	0	0.00	11.
12.	260-270 Vocational Education - Basic Grants	0.00	0.00	18,000	14,365.00	12.
13.	280 ESEA Title X - Homeless Education	0.00	0.00	0	0.00	13.
14.	290 Medicaid Reimbursement	0.00	0.75	165,000	50,000.00	14.
15.	349 National Forest Fees	0.00	0.00	0	0.00	15.
16.	353 Taylor Grazing Fees	0.00	0.00	0	0.00	16.
17.	374 E-Rate	0.00	0.00	75,000	0.00	17.
18.	378 Impact Aid	0.00	0.00	0	0.00	18.
19.	300-399 Other Federal Projects	1.95	0.00	375,000	21,000.00	19.
20.	699 Federal Impact Aid (Construction)	0.00	0.00	0	0.00	20.
21.	Total Federal Project Funds (lines 1-20)	7.34	6.13	1,157,500	567,000	21.
	State projects FTE & expenditures					
22.	400 Vocational Education	0.00	0.05	5,000	5,215	22.
23.	410 Early Childhood Block Grant	0.00	0.00	0	0	23.
24.	420 Ext. School Yr. - Pupils with Disabilities	0.00	0.00	0	0	24.
25.	425 Adult Basic Education	0.00	0.00	0	0	25.
26.	430 Chemical Abuse Prevention Programs	0.00	0.00	0	0	26.
27.	435 Academic Contests	0.00	0.00	0	0	27.
28.	450 Gifted Education	0.00	0.00	0	0	28.
29.	456 College Credit Exam Incentives	0.00	0.00	0	300	29.
30.	460 Environmental Special Plate	0.00	0.00	0	0	30.
31.	Other State Projects	0.00	0.00	70,000	60,000	31.
32.	Total State Project Funds (lines 22-31)	0.00	0.05	75,000	65,515	32.
33.	Total Special Projects (lines 21 and 32)	7.34	6.18	1,232,500	632,515	33.

	Instructional Improvement Fund Expenditures (020)	Prior FY	Budget FY	
1.	Teacher Compensation Increases	200,000	127,907	1.
2.	Class Size Reduction	0	0	2.
3.	Dropout Prevention Programs (M&O purposes)	0	0	3.
4.	Instructional Improvement Programs (M&O purposes)	0	0	4.
5.	Total Instructional Improvement Fund (lines 1-4)	200,000	127,907	5.

Other funds expenditures

		Prior FY	Budget FY	
1.	050 County, City, and Town Grants	0	0	1.
2.	071 English Language Learner (1)	0	0	2.
3.	072 Compensatory Instruction (1)	0	0	3.
4.	500 School Plant (2)	20,000	273	4.
5.	510 Food Service	300,000	250,000	5.
6.	515 Civic Center	80,000	4,000	6.
7.	520 Community School	35,000	15,000	7.
8.	525 Auxiliary Operations	100,000	241,463	8.
9.	526 Extracurricular Activities Fees Tax Credit	65,000	61,000	9.
10.	530 Gifts and Donations	550,000	387,000	10.
11.	535 Career & Technical Education Projects	30,000	19,000	11.
12.	540 Fingerprint	0	0	12.
13.	545 School Opening	0	0	13.
14.	550 Insurance Proceeds	75,000	60,618	14.
15.	555 Textbooks	3,000	1,318	15.
16.	565 Litigation Recovery	30,000	37,800	16.
17.	570 Indirect Costs	155,000	22,000	17.
18.	575 Unemployment Insurance	0	0	18.
19.	580 Teacherage	0	0	19.
20.	585 Insurance Refund	10,000	10,100	20.
21.	590 Grants and Gifts to Teachers	0	0	21.
22.	595 Advertisement	0	0	22.
23.	596 Career Technical Education	250,000	60,000	23.
24.	597 Arizona Industry Credentials Incentive	0	0	24
25.	639 Impact Aid Revenue Bond Building	0	0	25.
26.	650 Gifts and Donations-Capital	0	0	26.
27.	660 Condemnation	0	0	27.
28.	665 Energy and Water Savings	80,000	77,623	28.
29.	686 Emergency Deficiencies Correction	60,000	0	29.
30.	691 Building Renewal Grant	0	0	30.
31.	700 Debt Service	1,000	0	31.
32.	720 Impact Aid Revenue Bond Debt Service	0	0	32.
33.	850 Student Activities	60,000	74,617	33.
34.	Other _____	0	0	34.
	Internal Service Funds 950-989			
1.	9___ Self-Insurance	0	0	1.
2.	955 Intergovernmental Agreements	0	0	2.
3.	9__ OPEB	0	0	3.
4.	9___ _____	0	0	4.

(1) From Supplement, line 10 and line 20, respectively.
(2) Indicate amount budgeted in Fund 500 for M&O purposes _____

District name Joseph City Unified School Distr **County** Navajo County **CTD number** 090202000

Version Revised #3

Calculation of FY 2026 General Budget Limit
(A.R.S. §15-947.C)

Instructions			A. Maintenance and Operation	B. Unrestricted Capital Outlay
*1.	FY 2026 Revenue Control Limit (RCL) (from BSA55 tab, page 3)	$ 4,520,251	$ 4,520,251	$ 0
*2. (a)	FY 2026 District Additional Assistance (DAA) (from BSA55 tab, page 4)	$ 275,338		
(b)	DAA Adjustment (from BSA55 tab, page 4)	$ 0		
(c)	Total DAA (line 2.a plus 2.b)	$ 275,338		275,338
*3.	FY 2026 Override Authorization (A.R.S. Sections 15-481 and 15-482 or 15-949 if small school adjustment phase down applies, see Calculations page, Calculation of Maximum Override for a District No Longer Eligible for a Small School Adjustment, line 6 and Calculation of Small School Adjustment Phase Down Limit, line 6)			
(a)	Maintenance and Operation		684,778	
(b)	Unrestricted Capital Outlay			
(c)	Special Program			
*4.	Small School Adjustment for Districts with a Student Count of 125 or less in K-8 or 100 or less in 9-12 (A.R.S. §15-949) (Up to $50,000 if no election is chosen for phase down, see Calculations page, Calculation of Small School Adjustment Phase Down Limit, line 6)			
*5.	Tuition Revenue (A.R.S. §§15-823 and 15-824) (Do **not** include full-day kindergarten or summer school tuition)			
(a)	Individuals and Other Private Sources			
(b)	Other Arizona Districts			
(c)	Out-of-State Districts and Other Governments			
(d)	Certificates of Educational Convenience (A.R.S. §§15-825, 15-825.01, and 15-825.02)			
*6.	State Assistance (A.R.S. §15-976) and Special Ed. Voucher Payments Received (A.R.S. §15-1204)			
*7.	Increase Authorized by County School Superintendent for Accommodation Schools [not to exceed amount on Calculations page, Calculation of M&O Fund Budget Balance Carryforward, line 15(e)] (A.R.S. §15-974.B)			
8.	Budget Increase for:			
(a)	Desegregation Expenditures (A.R.S. §15-910.G-K)			
* (b)	Budget Balance Carryforward (from Calculations page, Calculation of M&O Fund Budget Balance Carryforward, line 13) (A.R.S. §15-943.01)		20,798	
(c)	Dropout Prevention Programs (Laws 1992, Ch. 305, §32 and Laws 2000, Ch. 398, §2)			
(d)	Registered Warrant or Tax Anticipation Note Interest Expense Incurred in FY 2024 (A.R.S. Section 15-910.M, as amended by Laws 2022, Ch. 285, §3)			
* (e)	Joint Career and Technical Education and Vocational Education Center (A.R.S. §15-910.01)			
* (f)	FY 2025 Performance Pay Unexpended Budget Carryforward (from Calculation page, Calculation of M&O Fund Budget Balance Carryforward, line 10.e) (A.R.S. §15-920)		0	
(g)	Excessive Property Tax Assessed Valuation Judgments (A.R.S. §§42-16213 and 42-16214)			
* (h)	Transportation Revenues for Attendance of Nonresident Pupils (A.R.S. §§15-923 and 15-947)			
*9.	Adjustment to the General Budget Limit (A.R.S. §§15-272, 15-905.M, 15-910.02, and 15-915) Include year(s) and descriptions, as applicable.			
(a)	Prior Year Over Expenditures/Resolutions:			
(b)	Decrease for Transfer from M&O to Energy and Water Savings Fund		0	
(c)	Increase for Energy and Water Savings Fund Transfer to M&O			
(d)	Noncompliance Adjustment			
(e)	ADM/Transportation Audit Adjustment			
(f)	Other:			
10.	Estimated Allocation of Additional Funding (Laws 2025, Ch. 233, §31)			
(a)	State aid supplement		32,493	
(b)	Onetime district additional assistance supplement		12,279	
(c)	Onetime FRPL group B weight supplement		9,436	
11.	FY 2026 General Budget Limit (column A, lines 1 through 10) (A.R.S. §15-905.F) (page 1, line 32 cannot exceed this amount)		$ 5,280,035	
12.	Total Amount to be Used for Capital Expenditures (column B, lines 1 through 10) (A.R.S. §15-905.F) (to page 8, line 11)			$ 275,338

* Subject to adjustment prior to May 15 as allowed by A.R.S. Revisions are described in the instructions for these lines, as needed.

District name Joseph City Unified School District **County** Navajo County **CTD number** 090202000

Instructions **Version** Revised #3

Calculation of FY 2026 Unrestricted Capital Budget Limit
(A.R.S. Section 15-947.D)

Unrestricted Capital Budget Limit

1.	FY 2025 Unrestricted Capital Budget Limit (UCBL) (from FY 2025 latest revised Budget, page 8, line 12)	$ 317,554
2.	Total UCBL Adjustment for prior years as notified by ADE on BUDG75 report (For budget adoption, use zero.)	$ 0
3.	Adjusted Amount Available for FY 2025 Capital Expenditures (line 1 + 2)	$ 317,554
4.	Amount Budgeted in Fund 610 in FY 2025 (from FY 2025 latest revised Budget, page 4, line 10)	$ 317,554
5.	Lesser of line 3 or the sum of line 4 and any positive adjustment on line 2	$ 317,554
6.	FY 2025 Fund 610 Actual Expenditures (For budget adoption use actual expenditures to date plus estimated expenditures through fiscal year-end.)	$ 294,697
7.	Unexpended Budget Balance in Fund 610 (line 5 minus 6) If negative, use zero in calculation, but show negative amount here in parentheses.	$ 22,857
8.	Interest Earned in Fund 610 in FY 2025	$ 0
9.	Monies deposited in Fund 610 from Division of School Facilities for donated land (A.R.S. §41-5741.F)	$
10.	Adjustment to UCBL for FY 2026 (A.R.S. Section 15-905.M) Include year(s) and descriptions, as applicable.	
	(a) Prior Year Over Expenditures/Resolutions:	$
	(b) ADM/Transportation Audit Adjustment	$
	(c) Other:	$
11.	Amount to be used for capital expenditures (from page 7, line 12)	$ 275,338
12.	FY 2026 Unrestricted Capital Budget Limit (lines 7 through 11) (1)	$ 298,195

(1) The amount budgeted on page 4, line 12 cannot exceed this amount.

District name Joseph City Unified School District | County Navajo County | CTD number 090202000 | Version Revised #3

Supplement to school district annual expenditure budget for districts that budget for English language learners
(A.R.S. §§15-756.04 and 15-756.11)

Instructions

English Language Learners Supplement Expenditures		FTE Prior FY	FTE Budget FY	Salaries 6100	Employee benefits 6200	Purchased services 6300, 6400, 6500	Supplies 6600	Property 6700	Other 6800	Totals Prior FY 2025	Totals Budget FY 2026	% Increase/ Decrease	
English Language Learner Fund 071 (A.R.S. §15-756.04)													
1000 Instruction	1.	0.00								0	0	0.0%	1.
2000 Support Services													
2100 Students	2.	0.00								0	0	0.0%	2.
2200 Instructional Staff	3.	0.00								0	0	0.0%	3.
2300 General Administration	4.	0.00								0	0	0.0%	4.
2400 School Administration	5.	0.00								0	0	0.0%	5.
2500 Central Services	6.	0.00								0	0	0.0%	6.
2600 Operation & Maintenance of Plant	7.	0.00								0	0	0.0%	7.
2700 Student Transportation	8.	0.00								0	0	0.0%	8.
2900 Other	9.	0.00								0	0	0.0%	9.
Total (lines 1-9) (to Budget, page 6, Other Funds, line 2)	10.	0.00	0.00	0	0	0	0		0	0	0	0.0%	10.
Compensatory Instruction Fund 072 (A.R.S. §15-756.11)													
1000 Instruction	11.	0.00								0	0	0.0%	11.
2000 Support Services													
2100 Students	12.	0.00								0	0	0.0%	12.
2200 Instructional Staff	13.	0.00								0	0	0.0%	13.
2300 General Administration	14.	0.00								0	0	0.0%	14.
2400 School Administration	15.	0.00								0	0	0.0%	15.
2500 Central Services	16.	0.00								0	0	0.0%	16.
2600 Operation & Maintenance of Plant	17.	0.00								0	0	0.0%	17.
2700 Student Transportation	18.	0.00								0	0	0.0%	18.
2900 Other	19.	0.00								0	0	0.0%	19.
Total (lines 11-19) (to Budget, page 6, Other Funds, line 3)	20.	0.00	0.00	0	0	0	0		0	0	0	0.0%	20.

Summary of School District Revised Expenditure Budget

CTD number 090202000
Version Revised #3

I certify that the budget of Joseph City Unified School District, Navajo County for fiscal year 2026 was officially revised by the Governing Board on, May 12, 2026, and that the complete Revised Expenditure Budget may be reviewed by contacting Steven Mills at the District Office, telephone 928-288-3307 during normal business hours.

President of the Governing Board

Instructions

1. Average Daily Membership:	2024 ADM	Prior year 2025 ADM	Budget year 2026 ADM
Attending	407.3003	390.1096	376.9214

2. Tax Rates:	Prior FY	Est. Budget FY
Primary rate (equalization formula funding and budget add-ons not required to be in secondary rate)	4.3101	4.2706
Secondary rate (voter-approved overrides, bonds, and Career Technical Education Districts, and desegregation, if applicable)	0.7392	0.7447

3. Budgeted expenditures and Budget Limits:	Budgeted Expenditures	Budgeted Carryforward	Budget Limit
Maintenance & Operation Fund	5,280,035	0	5,280,035
Classroom Site Fund	1,017,552	249,236	1,266,788
Unrestricted Capital Outlay Fund	298,195	0	298,195

4. Average teacher salaries (A.R.S. §15-903.E)	
1. Average salary of all teachers employed in FY 2026 (budget year)	55,142
2. Average salary of all teachers employed in FY 2025 (prior year)	54,061
3. Increase in average teacher salary from the prior year	1,081
4. Percentage increase	2%

Comments on average salary calculation (Optional):

Maintenance and Operation Expenditures

	Salaries and Benefits		Other		TOTAL		% Inc./(Decr.) from
	Prior FY	Budget FY	Prior FY	Budget FY	Prior FY	Budget FY	Prior FY
100 Regular Education							
1000 Instruction	1,732,687	1,320,830	34,775	108,615	1,767,462	1,429,445	-19.1%
2000 Support Services							
2100 Students	274,733	239,429	19,017	19,868	293,750	259,297	-11.7%
2200 Instructional Staff	192,110	199,257	38,644	44,065	230,754	243,322	5.4%
2300, 2400, 2500 Administration	604,547	601,631	115,270	158,020	719,817	759,651	5.5%
2600 Oper./Maint. of Plant	396,967	394,663	744,287	677,845	1,141,254	1,072,508	-6.0%
2900 Other	0	0	0	0	0	0	0.0%
3000 Oper. of Noninstructional Services	10,500	500	0	86,350	10,500	86,850	727.1%
610 School-Sponsored Cocurric. Activities	27,715	32,143	2,195	9,725	29,910	41,868	40.0%
620 School-Sponsored Athletics	108,581	156,511	37,381	69,892	145,962	226,403	55.1%
630, 700, 800, 900 Other Programs	21,151	20,268	0	0	21,151	20,268	-4.2%
Regular Education Subsection Subtotal	3,368,991	2,965,232	991,569	1,174,380	4,360,560	4,139,612	-5.1%
200 and 300 Special Education							
1000 Instruction	359,108	389,761	1,316	1,316	360,424	391,077	8.5%
2000 Support Services							
2100 Students	121,038	121,038	155,579	155,579	276,617	276,617	0.0%
2200 Instructional Staff	25,430	25,430	2,072	2,072	27,502	27,502	0.0%
2300, 2400, 2500 Administration	0	0	1,058	1,058	1,058	1,058	0.0%
2600 Oper./Maint. of Plant	0	0	0	0	0	0	0.0%
2900 Other	0	0	0	0	0	0	0.0%
3000 Oper. of Noninstructional Services	0	0	0	0	0	0	0.0%
Special Education Subsection Subtotal	505,576	536,229	160,025	160,025	665,601	696,254	4.6%
400 Pupil Transportation	194,119	227,620	127,367	197,981	321,486	425,601	32.4%
510 Desegregation	0	0	0	0	0	0	0.0%
530 Dropout Prevention Programs	0	0	0	0	0	0	0.0%
540 Joint Career and Technical Education and Vocational Education Center	0	0	0	0	0	0	0.0%
550 K-3 Reading Program	18,387	18,568	0	0	18,387	18,568	1.0%
Budgeted Expenditures	4,087,073	3,747,649	1,278,961	1,532,386	5,366,034	5,280,035	-1.6%

Summary of School District Revised Expenditure Budget (Concl'd)

CTD number 090202000
Version Revised #3

Total expenditures by fund				
Fund	**Budgeted Expenditures**		**$ Increase/(Decrease) from Prior FY**	**% Increase/(Decrease) from Prior FY**
	Prior FY	**Budget FY**		
Maintenance & Operation	5,366,034	5,280,035	(85,999)	-1.6%
Instructional Improvement	200,000	127,907	(72,093)	-36.0%
English Language Learner	0	0	0	0.0%
Compensatory Instruction	0	0	0	0.0%
Classroom Site	1,378,054	1,017,552	(360,502)	-26.2%
Federal Projects	1,157,500	567,000	(590,500)	-51.0%
State Projects	75,000	65,515	(9,485)	-12.6%
Unrestricted Capital Outlay	317,554	298,195	(19,359)	-6.1%
New School Facilities	0	0	0	0.0%
Adjacent Ways	196,084	187,225	(8,859)	-4.5%
Debt Service	1,000	0	(1,000)	-100.0%
School Plant Fund	20,000	273	(19,727)	-98.6%
Auxiliary Operations	100,000	241,463	141,463	141.5%
Bond Building	0	0	0	0.0%
Food Service	300,000	250,000	(50,000)	-16.7%
Other	1,483,000	830,076	(652,924)	-44.0%

M&O Fund Special Education Programs by type		
Program (A.R.S. §§15-761 and 15-903)	**Prior FY**	**Budget FY**
Total All Disability Classifications	570,752	647,577
Gifted Education	0	0
Remedial Education	0	0
ELL Incremental Costs	0	0
ELL Compensatory Instruction	0	0
Vocational and Technical Education (non-CTED)	0	5,182
Career Education (non-CTED)	0	0
Career Technical Education (CTED)	94,849	43,495
TOTAL	665,601	696,254

Proposed staffing summary				
Staff Type	**Purchased Services Personnel FTE**	**Employee FTE**	**Total FTE**	**Staff-Pupil Ratio**
Certified --				
Superintendent, principals, other administrators	0	3	3	1 to 125.6
Teachers	0	29	29	1 to 13.0
Other	0	1	1	1 to 376.9
Subtotal	0	33	33	1 to 11.4
Classified --				
Managers, supervisors, directors	0	5	5	1 to 75.4
Teachers aides	0	18	18	1 to 20.9
Other	0	10	10	1 to 37.7
Subtotal	0	33	33	1 to 11.4
TOTAL	0	66	66	1 to 5.7
Special education --				
Teacher	0	1	1	1 to 22.0
Staff	0	13	13	1 to 22.0

9.E. **Discussion and Possible Action Regarding Contract and Employment Terms for the New Superintendent (*)**

10. **INFORMATION ITEMS**

10.A. **Public Review of Proposed Textbook/Curriculum Adoptions**

Textbook/curriculum materials will be available for public review for 60 days prior to board consideration for adoption at a future board meeting in accordance with Governing Board Policy IJJ. Curriculum materials are on display in the District Office Board Room and may be viewed during business hours. This is an information item only and no action will be taken at this meeting.

Textbooks, supplementary materials and online resources proposed for adoption are High School Environmental Science PDF version of Environmental Science Copyright© by Holt, Rinehart and Winston
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Biological Sciences Open Textbooks | Biological Sciences

Spring 2018

Introduction to Environmental Science: 2nd Edition

Caralyn Zehnder
Georgia College and State University, caralyn.zehnder@gcsu.edu

Kalina Manoylov
Georgia College and State University, kalina.manoylov@gcsu.edu

Samuel Mutiti
Georgia College and State University, samuel.mutiti@gcsu.edu

Christine Mutiti
Georgia College and State University, christine.mutiti@gcsu.edu

Allison VandeVoort
Georgia College and State University, allison.vandevoort@gcsu.edu

See next page for additional authors

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Zehnder, Caralyn; Manoylov, Kalina; Mutiti, Samuel; Mutiti, Christine; VandeVoort, Allison; and Bennett, Donna, "Introduction to Environmental Science: 2nd Edition" (2018). *Biological Sciences Open Textbooks*. 4.
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Authors

Caralyn Zehnder, Kalina Manoylov, Samuel Mutiti, Christine Mutiti, Allison VandeVoort, and Donna Bennett

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Georgia College and State University

UNIVERSITY SYSTEM
OF GEORGIA

Caralyn Zehnder, Kalina Manoylov, Samuel Mutiti,
Christine Mutiti, Allison VandeVoort, Donna Bennett

Introduction to Environmental Science

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Table of Contents

i. Introduction
ii. Population Ecology
iii. Human Demography
iv. Non-Renewable Energy
v. Alternative Energy
vi. Air Pollution
vii. Climate Change
viii. Water

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Chapter 1: Introduction to Environmental Sciences

Learning Objectives

At the end of this section, students will be able to:

1. Describe, at an introductory level, the basic chemical and biological foundations of life on Earth
2. Define environment, ecosystems, and environmental sciences
3. Give examples of the interdisciplinary nature of environmental science
4. Define sustainability and sustainable development
5. Explain the complex relationship between natural and human systems, pertaining to environmental impact, the precautionary principle, and environmental justifications
6. Understand scientific approach and begin to apply the scientific method

The Chemical and Biological Foundations of Life

Elements in various combinations comprise all matter on Earth, including living things. Some of the most abundant elements in living organisms include carbon, hydrogen, nitrogen, oxygen, sulfur, and phosphorus. These form the nucleic acids, proteins, carbohydrates, and lipids that are the fundamental components of living matter. Biologists must understand these important building blocks and the unique structures of the atoms that make up molecules, allowing for the formation of cells, tissues, organ systems, and entire organisms.

At its most fundamental level, life is made up of matter. **Matter** is any substance that occupies space and has mass. **Elements** are unique forms of matter with specific chemical and physical properties that cannot be broken down into smaller substances by ordinary chemical reactions. There are 118 elements, but only 92 occur naturally. The remaining elements are synthesized in laboratories and are unstable. The five elements common to all living organisms are oxygen (O), carbon (C), hydrogen (H), and nitrogen (N) and phosphorous (P). In the non-living world, elements are found in different proportions, and some elements common to living organisms are relatively rare on the earth as a whole (**Table 1.1**). For example, the atmosphere is rich in nitrogen and oxygen but contains little carbon and hydrogen, while the earth's crust, although it contains oxygen and a small amount of hydrogen, has little nitrogen and carbon. In spite of their differences in abundance, all elements and the chemical reactions between them obey the same chemical and physical laws regardless of whether they are a part of the living or non-living world.

Table 1.1. Approximate percentage of elements in living organisms (from bacteria to humans) compared to the non-living world. Trace represents less than 1%.

	Biosphere	Atmosphere	Lithosphere
Oxygen (O)	65%	21%	46%
Carbon (C)	18%	trace	trace
Hydrogen (H)	10%	trace	trace
Nitrogen (N)	3%	78%	trace
Phosphorus (P)	trace	trace	>30%

The Structure of the Atom

An **atom** is the smallest unit of matter that retains all of the chemical properties of an element. For example, one gold atom has all of the properties of gold in that it is a solid metal at room temperature. A gold coin is simply a very large number of gold atoms molded into the shape of a coin and containing small amounts of other elements known as impurities. Gold atoms cannot be broken down into anything smaller while still retaining the properties of gold. An atom is composed of two regions: the **nucleus**, which is in the center of the atom and contains protons and neutrons, and the outermost region of the atom which holds its electrons in orbit around the nucleus, as illustrated in **Figure 1.1**. Atoms contain protons, electrons, and neutrons, among other subatomic particles. The only exception is hydrogen (H), which is made of one proton and one electron with no neutrons.

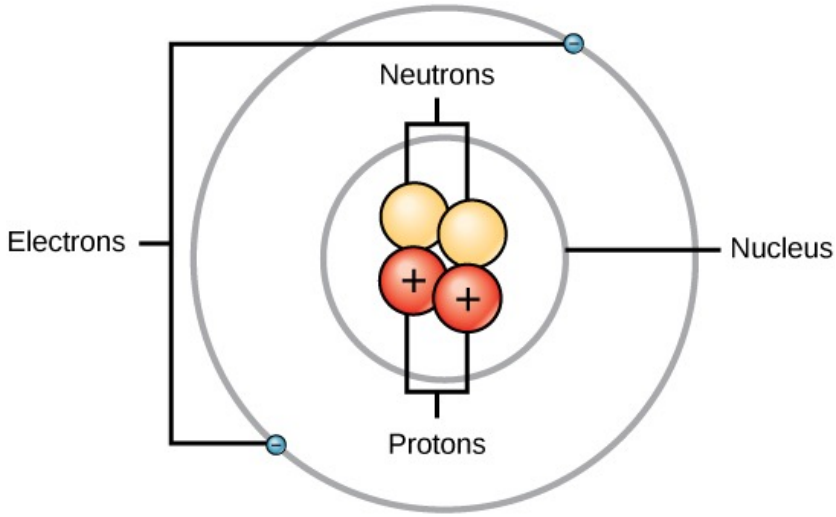


Figure 1.1. Elements, such as helium, depicted here, are made up of atoms. Atoms are made up of protons and neutrons located within the nucleus, with electrons in orbitals surrounding the nucleus.

Protons and neutrons have approximately the same mass, about 1.67×10^{-24} grams. Scientists arbitrarily define this amount of mass as one atomic mass unit (amu) (**Table 1.2**). Although similar in mass, protons and neutrons differ in their electric charge. A **proton** is positively

charged whereas a **neutron** is uncharged. Therefore, the number of neutrons in an atom contributes significantly to its mass, but not to its charge.

Table 1.2. Protons, neutrons, and electrons

	Charge	Mass (amu)	Location in atom
Proton	+1	1	Nucleus
Neutron	0	1	Nucleus
Electron	-1	0	Orbitals

Electrons are much smaller in mass than protons, weighing only 9.11×10^{-28} grams, or about 1/1800 of an atomic mass unit. Hence, they do not contribute much to an element's overall atomic mass. Although not significant contributors to mass, electrons do contribute greatly to the atom's charge, as each electron has a negative charge equal to the positive charge of a proton. In uncharged, neutral atoms, the number of electrons orbiting the nucleus is equal to the number of protons inside the nucleus. In these atoms, the positive and negative charges cancel each other out, leading to an atom with no net charge. Accounting for the sizes of protons, neutrons, and electrons, most of the volume of an atom—greater than 99 percent—is, in fact, empty space. With all this empty space, one might ask why so-called solid objects do not just pass through one another. The reason they do not is that the electrons that surround all atoms are negatively charged and negative charges repel each other. When an atom gains or loses an electron, an **ion** is formed. Ions are charged forms of atoms. A positively charged ion, such as sodium (Na^+), has lost one or more electrons. A negatively charged ion, such as chloride (Cl^-), has gained one or more electrons.

Molecules

Molecules are formed when two or more atoms join together through chemical bonds to form a unit of matter. Throughout your study of environmental science, you will encounter many molecules including carbon dioxide gas. Its chemical formula is CO_2, indicating that this molecule is made up of one carbon atom and two oxygen atoms. Some molecules are charged due to the ions they contain. This is the case for the nitrate (NO_3^-), a common source of nitrogen to plants. It contains one nitrogen atom and three oxygen atoms, and has an overall charge of negative one.

Isotopes

Isotopes are different forms of an element that have the same number of protons but a different number of neutrons. Some elements—such as carbon, potassium, and uranium—have naturally occurring isotopes. Carbon-12 contains six protons, six neutrons, and six electrons; therefore, it has a mass number of 12 (six protons and six neutrons). Carbon-14 contains six protons, eight neutrons, and six electrons; its atomic mass is 14 (six protons and eight electrons). These two alternate forms of carbon are isotopes. Some isotopes may emit neutrons, protons, and electrons,

and attain a more stable atomic configuration (lower level of potential energy); these are radioactive isotopes, or **radioisotopes**. Radioactive decay describes the energy loss that occurs when an unstable atom's nucleus releases radiation, for example, carbon-14 losing neutrons to eventually become carbon-12.

Carbon

The basic functional unit of life is a cell and all organisms are made up of one or more cells. Cells are made of many complex molecules called macromolecules, such as proteins, nucleic acids (RNA and DNA), carbohydrates, and lipids. The macromolecules are a subset of **organic molecules** that are especially important for life. The fundamental component for all of these macromolecules is carbon. The carbon atom has unique properties that allow it to form covalent bonds with as many as four different atoms, making this versatile element ideal to serve as the basic structural component, or "backbone," of the macromolecules.

Hydrocarbons

Hydrocarbons are organic molecules consisting entirely of carbon and hydrogen, such as methane (CH_4. We often use hydrocarbons in our daily lives as fuels—like the propane in a gas grill or the butane in a lighter. The many covalent bonds between the atoms in hydrocarbons store a great amount of energy, which is released when these molecules are burned (oxidized). Methane, an excellent fuel, is the simplest hydrocarbon molecule, with a central carbon atom bonded to four different hydrogen atoms, as illustrated in **Figure 1.2**.

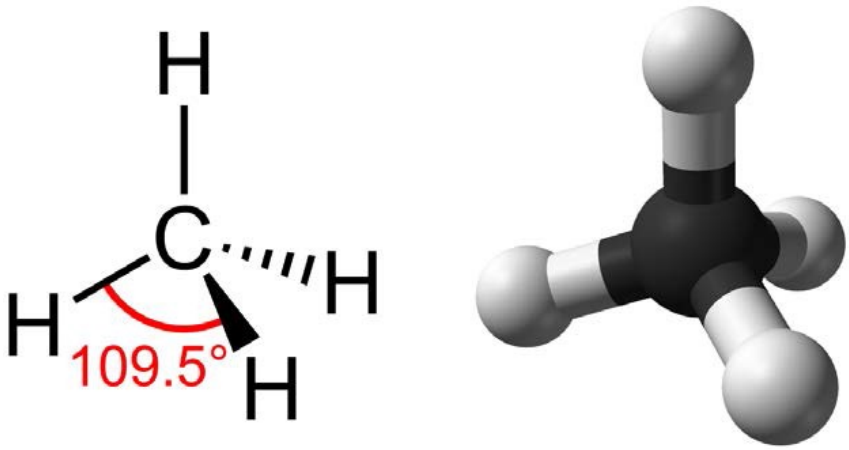


Figure 1.2. Methane (CH_4) has a tetrahedral geometry, with each of the four hydrogen atoms spaced 109.5° apart.

As the backbone of the large molecules of living things, hydrocarbons may exist as linear carbon chains, carbon rings, or combinations of both. This three-dimensional shape or conformation of the large molecules of life (macromolecules) is critical to how they function.

Biological molecules

Life on Earth is primarily made up of four major classes of biological molecules, or biomolecules. These include carbohydrates, lipids, proteins, and nucleic acids.

Most people are familiar with **carbohydrates**, one type of macromolecule, especially when it comes to what we eat. Carbohydrates are, in fact, an essential part of our diet; grains, fruits, and vegetables are all natural sources of carbohydrates. Carbohydrates provide energy to the body, particularly through **glucose**, a simple sugar that is a component of **starch** and an ingredient in many staple foods. Carbohydrates also have other important functions in humans, animals, and plants. Carbohydrates can be represented by the stoichiometric formula $(CH_2O)n$, where n is the number of carbons in the molecule. In other words, the ratio of carbon to hydrogen to oxygen is 1:2:1 in carbohydrate molecules. This formula also explains the origin of the term "carbohydrate": the components are carbon ("carbo") and the components of water (hence, "hydrate"). The chemical formula for glucose is $C_6H_{12}O_6$. In humans, glucose is an important source of energy.

During **cellular respiration**, energy is released from glucose, and that energy is used to help make **adenosine triphosphate** (ATP). Plants synthesize glucose using carbon dioxide and water, and glucose in turn is used for energy requirements for the plant. Excess glucose is often stored as starch that is catabolized (the breakdown of larger molecules by cells) by humans and other animals that feed on plants. Plants are able to synthesize glucose, and the excess glucose, beyond the plant's immediate energy needs, is stored as starch in different plant parts, including roots and seeds. The starch in the seeds provides food for the embryo as it germinates and can also act as a source of food for humans and animals.

Lipids include a diverse group of compounds such as fats, oils, waxes, phospholipids, and steroids that are largely nonpolar in nature. Nonpolar molecules are hydrophobic ("water fearing"), or insoluble in water. These lipids have important roles in energy storage, as well as in the building of cell membranes throughout the body.

Proteins are one of the most abundant organic molecules in living systems and have the most diverse range of functions of all macromolecules. Proteins may be structural, regulatory, contractile, or protective; they may serve in transport, storage, or membranes; or they may be toxins or enzymes. Each cell in a living system may contain thousands of proteins, each with a unique function. Their structures, like their functions, vary greatly.

Enzymes, which are produced by living cells, speed up biochemical reactions (like digestion) and are usually complex proteins. Each enzyme has a specific shape or formation based on its use. The enzyme may help in breakdown, rearrangement, or synthesis reactions.

Proteins have different shapes and molecular weights. Protein shape is critical to its function, and many different types of chemical bonds maintain this shape. Changes in temperature, pH, and exposure to chemicals may cause a protein to **denature**. This is a permanent change in the shape of the protein, leading to loss of function. All proteins are made up of different arrangements of the same 20 types of **amino acids**. These amino acids are the units that make up proteins. Ten of these are considered essential amino acids in humans because the human body cannot produce them and they are obtained from the diet. The sequence and the number of amino acids ultimately determine the protein's shape, size, and function.

Nucleic acids are the most important macromolecules for the continuity of life. They carry the genetic blueprint of a cell and carry instructions for the functioning of the cell. The two main types of nucleic acids are **deoxyribonucleic acid (DNA)** and **ribonucleic acid (RNA)**. DNA is the genetic material found in all living organisms, ranging from single-celled bacteria to multicellular mammals. DNA controls all of the cellular activities by turning the genes "on" or "off." The other type of nucleic acid, RNA, is mostly involved in protein synthesis.
DNA has a double-helix structure (**Figure 1.3**).

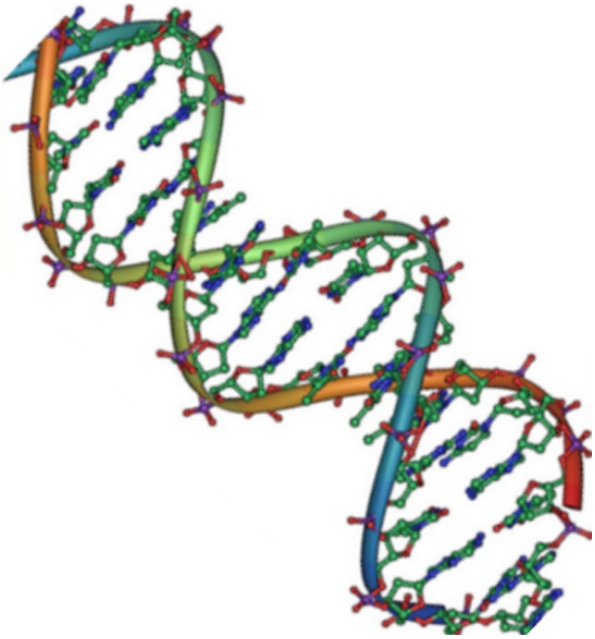


Figure 1.3. Native DNA is an antiparallel double helix. The phosphate backbone (indicated by the curvy lines) is on the outside, and the bases are on the inside. Each base from one strand interacts via hydrogen bonding with a base from the opposing strand. (credit: Jerome Walker/Dennis Myts)

Biological organization

All living things are made of cells; the **cell** itself is the smallest fundamental unit of structure and function in living organisms. In most organisms, these cells contain **organelles**, which provide specific functions for the cell. Living organisms have the following properties: all are highly organized, all require energy for maintenance and growth, and all grow over time and respond to their environment. All organisms adapt to the environment and all ultimately reproduce contributing genes to the next generation. Some organisms consist of a single cell and others are multicellular. **Organisms** are individual living entities. For example, each tree in a forest is an organism.

All the individuals of a species living within a specific area are collectively called a **population**. Populations fluctuate based on a number of factors: seasonal and yearly changes in the environment, natural disasters such as forest fires and volcanic eruptions, and competition for resources between and within species. A **community** is the sum of populations inhabiting a particular area. For instance, all of the trees, insects, and other populations in a forest form the forest's community. The forest itself is an ecosystem.

An **ecosystem** consists of all the living things in a particular area together with the abiotic, non-living parts of that environment such as nitrogen in the soil or rain water. At the highest level of organization, the **biosphere** is the collection of all ecosystems, and it represents the zones of life on earth. It includes land, water, and even the atmosphere to a certain extent.

Life in an ecosystem is often about competition for limited resources, a characteristic of the process of natural selection. **Competition** in communities (all living things within specific habitats) is observed both within species and among different species. The resources for which organisms compete include organic material from living or previously living organisms, sunlight, and mineral nutrients, which provide the energy for living processes and the matter to make up organisms' physical structures. Other critical factors influencing community dynamics are the components of its physical and geographic environment: a habitat's latitude, amount of rainfall, topography (elevation), and available species. These are all important environmental variables that determine which organisms can exist within a particular area. Ecosystems can be small, such as the tidal pools found near the rocky shores of many oceans, or large, such as the Amazon Rainforest in Brazil (**Figure 1.4**).

There are three broad categories of ecosystems based on their general environment: freshwater, ocean water (marine), and terrestrial. Within these broad categories are individual ecosystem types based on the organisms present and the type of environmental habitat. Ocean ecosystems are the most common, comprising 75 percent of the Earth's surface. The shallow ocean ecosystems include extremely biodiverse coral reef ecosystems, and the deep ocean surface is known for its large numbers of plankton and krill (small crustaceans) that support it. These two

environments are especially important to aerobic respirators worldwide as the phytoplankton perform 40 percent of all photosynthesis on Earth. Although not as diverse as the other two, deep ocean ecosystems contain a wide variety of marine organisms. Such ecosystems exist even at the bottom of the ocean where light is unable to penetrate through the water.

Freshwater ecosystems are the rarest, occurring on only 1.8 percent of the Earth's surface. Lakes, rivers, streams, and springs comprise these systems; they are quite diverse, and they support a variety of fish, amphibians, reptiles, insects, phytoplankton, fungi, and bacteria.

(a) (b)

Figure 1.4. (a) A tidal pool ecosystem in Matinicus Island, Maine, is a small ecosystem, while (b) the Amazon rainforest in Brazil is a large ecosystem. (credit a: modification of work by Jim Kuhn; credit b: modification of work by Ivan Mlinaric)

Terrestrial ecosystems, also known for their diversity, are grouped into large categories called **biomes**, such as tropical rainforests, savannas, deserts, coniferous forests, deciduous forests, and tundra. Grouping these ecosystems into just a few biome categories obscures the great diversity of the individual ecosystems within them. For example, there is great variation in desert vegetation: the saguaro cacti and other plant life in the Sonoran Desert, in the United States, are relatively abundant compared to the desolate rocky desert of Boa Vista, an island off the coast of Western Africa.

All living things require energy in one form or another. It is important to understand how organisms acquire energy and how that energy is passed from one organism to another through **food webs**. Food webs illustrate how energy flows directionally through ecosystems, including how efficiently organisms acquire it, use it, and how much remains for use by other organisms of

the food web. The flow of energy and matter through the ecosystems influences the abundance and distribution of organisms within them.

Ecosystems are complex with many interacting parts. They are routinely exposed to various disturbances: changes in the environment that affect their compositions, such as yearly variations in rainfall and temperature. Many disturbances are a result of natural processes. For example, when lightning causes a forest fire and destroys part of a forest ecosystem, the ground is eventually populated with grasses, followed by bushes and shrubs, and later mature trees: thus, the forest is restored to its former state. This process is so universal that ecologists have given it a name—**succession**. The impact of environmental disturbances caused by human activities is now as significant as the changes wrought by natural processes. Human agricultural practices, air pollution, acid rain, global deforestation, overfishing, oil spills, and illegal dumping on land and into the ocean all have impacts on ecosystems.

We rely on ecosystem services. Earth's natural systems provide **ecosystem services** required for our survival such as: air and water purification, climate regulation, and plant pollination. We have degraded nature's ability to provide these services by depleting resources, destroying habitats, and generating pollution. The benefits people obtain from ecosystems include: nutrient cycling, soil formation, and **primary production**. Another important service of natural ecosystems is provisioning like food production, production of wood, fibers and fuel. Ecosystems are responsible for climate regulation, flood regulation together with disease regulation. Finally ecosystems provide cultural and esthetic services. As humans we benefit from observing natural habitats, recreation in waters and mountains. Nature is a source of inspiration for poets and writers. It is a source of aesthetic, religious and other nonmaterial benefits. Studying ecosystem structure in its original state is the only way we can make **anthropogenic** (man-made) systems like agricultural fields, reservoirs, fracking operations, and dammed rivers work for human benefit with minimal impact on our and other organisms' health.

Environment and environmental science

Viewed from space, Earth (**Figure 1.5**) offers no clues about the diversity of lifeforms that reside there. The first forms of life on Earth are thought to have been microorganisms that existed for billions of years in the ocean before plants and animals appeared. The mammals, birds, and plants so familiar to us are all relatively recent, originating 130 to 200 million years ago. Humans have inhabited this planet for only the last 2.5 million years, and only in the last 200,000 years have humans started looking like we do today. There are around 7.35 billion people today (https://www.census.gov/popclock/).

Figure 1.5 This NASA image is a composite of several satellite-based views of Earth. To make the whole-Earth image, NASA scientists combine observations of different parts of the planet. (credit: NASA/GSFC/NOAA/USGS)

The word **environment** describes living and nonliving surroundings relevant to organisms. It incorporates physical, chemical and biological factors and processes that determine the growth and survival of organisms, populations, and communities. All these components fit within the ecosystem concept as a way to organize all of the factors and processes that make up the environment. The ecosystem includes organisms and their environment within a specific area. Review the previous section for in-depth information regarding the Earth's ecosystems. Today, human activities influence all of the Earth's ecosystems.

Environmental science studies all aspects of the environment in an **interdisciplinary** way. This means that it requires the knowledge of various other subjects including biology, chemistry, physics, statistics, microbiology, biochemistry, geology, economics, law, sociology, etc. It is a relatively new field of study that has evolved from integrated use of many disciplines. **Environmental engineering** is one of the fastest growing and most complex disciplines of engineering. Environmental engineers solve problems and design systems using knowledge of environmental concepts and ecology, thereby providing solutions to various environmental problems. **Environmentalism**, in contrast, is a social movement through which citizens are involved in activism to further the protection of environmental landmarks and natural resources. This is not a field of science, but incorporates some aspects of environmental knowledge to advance conservation and sustainability efforts.

The Process of Science

Environmental science is a science, but what exactly is science? **Science** (from the Latin *scientia*, meaning "knowledge") can be defined as all of the fields of study that attempt to comprehend the nature of the universe and all its parts. The **scientific method** is a method of research with defined steps that include experiments and careful observation. One of the most important aspects of this method is the testing of hypotheses by means of repeatable experiments. A **hypothesis** is a suggested explanation for an event, which can be tested. A **theory** is a tested and confirmed explanation for observations or phenomena that is supported by many repeated experiences and observations.

The scientific method

The scientific process typically starts with an observation (often a problem to be solved) that leads to a question. The scientific method consists of a series of well-defined steps. If a hypothesis is not supported by experimental data, a new hypothesis can be proposed. Let's think about a simple problem that starts with an observation and apply the scientific method to solve the problem. One Monday morning, a student arrives in class and quickly discovers that the classroom is too warm. That is an observation that also describes a problem: the classroom is too warm. The student then asks a question: "Why is the classroom so warm?"

Proposing a Hypothesis

Recall that a hypothesis is a suggested explanation that can be tested. To solve a problem, several hypotheses may be proposed. For example, one hypothesis might be, "The classroom is warm because no one turned on the air conditioning." But there could be other responses to the question, and therefore other hypotheses may be proposed. A second hypothesis might be, "The classroom is warm because there is a power failure, and so the air conditioning doesn't work." Once a hypothesis has been selected, the student can make a prediction. A prediction is similar to a hypothesis but it typically has the format "If . . . then . . . ." For example, the prediction for the first hypothesis might be, "*If* the student turns on the air conditioning, *then* the classroom will no longer be too warm."

Testing a Hypothesis

A valid hypothesis must be testable. It should also be <u>falsifiable</u>, meaning that it can be disproven by experimental results. Importantly, science does not claim to "prove" anything because scientific understandings are always subject to modification with further information. This step — openness to disproving ideas — is what distinguishes sciences from non-sciences. The presence of the supernatural, for instance, is neither testable nor falsifiable.

To test a hypothesis, a researcher will conduct one or more **experiments** designed to eliminate, or disprove, the hypotheses. Each experiment will have one or more variables and one or more controls. A **variable** is any part of the experiment that can vary or change during the experiment. The **independent variable** is the variable that is manipulated throughout the course of the

experiment. The **dependent variable**, or response variable is the variable by which we measure change in response to the independent variable. Ideally, all changes that we measure in the dependent variable are because of the manipulations we made to the independent variable. In most experiments, we will maintain one group that has had no experimental change made to it. This is the **control group**. It contains every feature of the **experimental group** except it is not given any manipulation. Therefore, if the results of the experimental group differ from the control group, the difference must be due to the hypothesized manipulation, rather than some outside factor. Look for the variables and controls in the examples that follow.

To test the hypothesis "*The classroom is warm because no one turned on the air conditioning*," the student would find out if the air conditioning is on. If the air conditioning is turned on but does not work, there should be another reason, and this hypothesis should be rejected. To test the second hypothesis, the student could check if the lights in the classroom are functional. If so, there is no power failure and this hypothesis should be rejected. Each hypothesis should be tested by carrying out appropriate experiments. Be aware that rejecting one hypothesis does not determine whether or not the other hypotheses can be accepted; it simply eliminates one hypothesis that is not valid (**Figure 1.7**). Using the scientific method, the hypotheses that are inconsistent with experimental data are rejected.

The scientific method may seem too rigid and structured. It is important to keep in mind that, although scientists often follow this sequence, there is flexibility. Sometimes an experiment leads to conclusions that favor a change in approach; often, an experiment brings entirely new scientific questions to the puzzle. Many times, science does not operate in a linear fashion; instead, scientists continually draw inferences and make generalizations, finding patterns as their research proceeds. Scientific reasoning is more complex than the scientific method alone suggests. Notice, too, that the scientific method can be applied to solving problems that aren't necessarily scientific in nature.

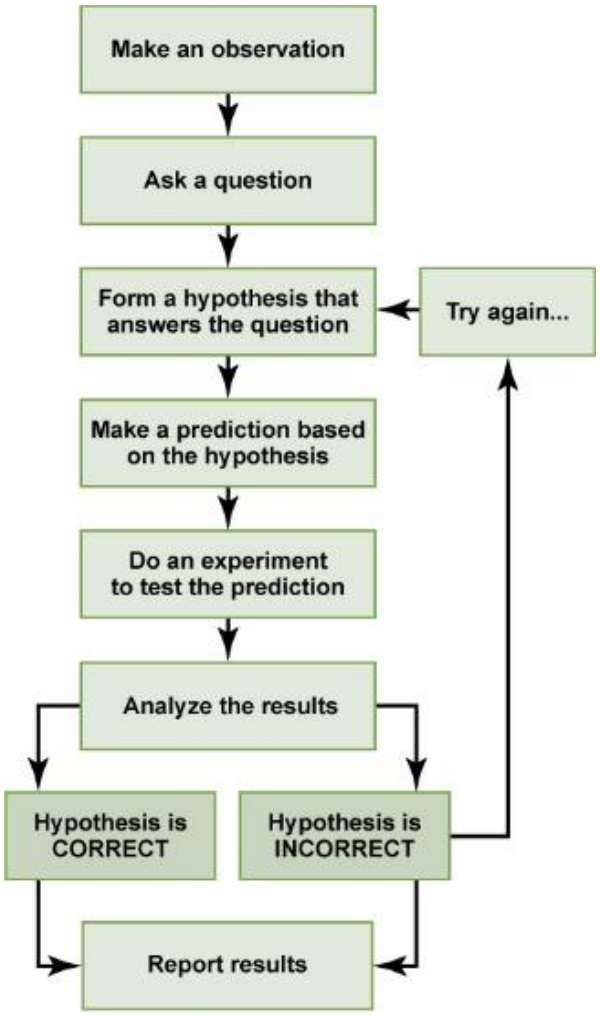


Figure 1.7. The scientific method consists of a series of well-defined steps. If a hypothesis is not supported by experimental data, a new hypothesis can be proposed.

Sustainability and Sustainable Development

In 1983 the United Nations General Assembly passed a resolution that established the Special Commission on the Environmental Perspective to the Year 2000 and Beyond (http://www.un.org/documents/ga/res/38/a38r161.htm). Their charge was:

a. To propose long-term environmental strategies for achieving sustainable development to the year 2000 and beyond;
b. To recommend ways in which concern for the environment may be translated into greater co-operation among developing countries and between countries at different stages of economic and social development and lead to the achievement of common and mutually supportive objectives which take account of the interrelationships between people, resources, environment and development;

c. To consider ways and means by which the international community can deal more effectively with environmental concerns, in light of the other recommendations in its report;
d. To help define shared perceptions of long-term environmental issues and of the appropriate efforts needed to deal successfully with the problems of protecting and enhancing the environment, a long-term agenda for action during the coming decades, and aspirational goals for the world community, taking into account the relevant resolutions of the session of a special character of the Governing Council in 1982.

Although the report did not technically invent the term **sustainability**, it was the first credible and widely disseminated study that used this term in the context of the global impacts of humans on the environment. Its main and often quoted definition refers to **sustainable development** as *development that meets the needs of the present without compromising the ability of future generations to meet their own needs*. The report uses the terms 'sustainable development', 'sustainable', and 'sustainability' interchangeably, emphasizing the connections among social equity, economic productivity, and environmental quality (**Figure 1.6**). This three-pronged approach to sustainability is now commonly referred to as the **triple bottom-line**. Preserving the environment for humans today and in the future is a responsibility of every generation and a long-term global goal. Sustainability and the triple bottom-line (meeting environmental, economic, and social goals simultaneously) require that we limit our environmental impact, while promoting economic well-being and social equity.

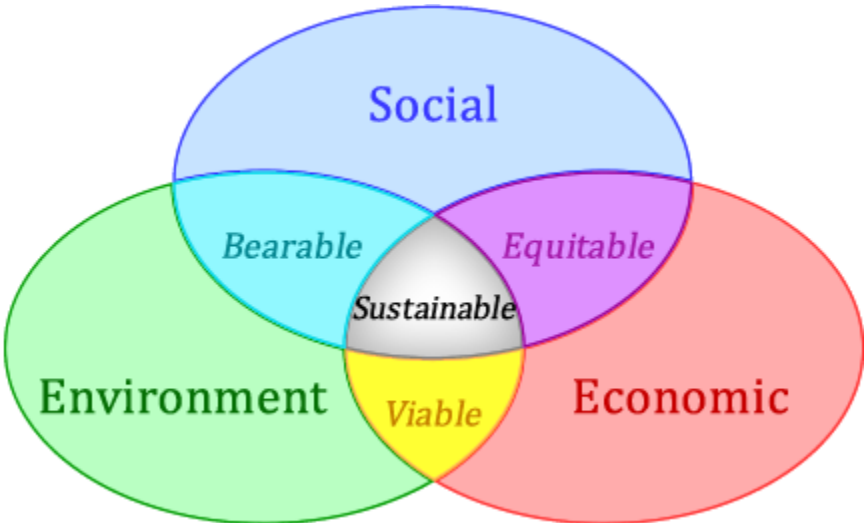


Figure 1.6. A depiction of the sustainability paradigm in terms of its three main components, showing various intersections among them. Source: International Union for the Conservation of Nature.

Examples of sustainable development include sustainable agriculture, which is agriculture that does not deplete soils faster than they form and does not destroy the biodiversity of the area. Sustainable farming and ranching do not reduce the amount of healthy soil, clean water, genetic diversity of crop plants and animals. Maintaining as much ecological **biodiversity** as possible in the agro-ecosystem is essential to long-term crop and livestock production.

The IPAT Equation

As attractive as the concept of sustainability may be as a means of framing our thoughts and goals, its definition is rather broad and difficult to work with when confronted with choices among specific courses of action. One way of measuring progress toward achieving sustainable goals can be with the application of the **IPAT equation**. This equation was designed in an attempt to define the different ways that a variety of factors contribute to the environmental degradation, or impact, of a particular setting. Importantly, IPAT tells us that there are more ways we impact our environment than just through pollution:

$$I = P \times A \times T$$

I represents the impacts on an environment
P is the size of the relevant human population
A is the affluence of the population
T is the technology available to the population

Affluence, or wealth, tells us the level of consumption per person. Wealthy societies consume more goods and services per person. Because of this, their environmental impact is multiplied. Technology, or impact per unit of consumption, interpreted in its broadest sense. This includes any human-created tool, system, or organization designed to enhance efficiency. As societies gain greater access to technology, they are able to do more work with fewer individuals. This equates to a greater impact per person. While this equation is not meant to be mathematically rigorous, it provides a way of organizing information for analysis.

The proportion of people living in cities has greatly increased over the past 50 years. We can use the IPAT equation to estimate the impact of these urban populations. When the impact of technology, which is much easier to access in urban settings, is combined with the impact of population, the impact on the environment is multiplied. In an increasingly urban world, we must focus much of our attention on the environments of cities and on the effects of cities on the rest of the environment. This equation also has large-scale applications in the environmental sciences, and was included in the Intergovernmental Panel on Climate Change Special Report on Emissions Scenarios (2001) to project future greenhouse gas emissions across the globe.

The precautionary principle

The **precautionary principle** or the precautionary approach is one perspective of environmental risk management. The precautionary principle stakes that "When the health of humans and the environment is at stake, it may not be necessary to wait for scientific certainty to take protective action". In other words, better to be safe than sorry. Proponents of the precautionary principle also believe that the burden of proof should be on the individual, company or government who is proposing the action, not on the people who will be affected by it. For example, if environmental regulations concerning pesticides were based on the precautionary principle (in the United States, they are not), then any pesticide that could potentially harm the environment or human health would not be used. Overuse of the precautionary principle can have negative consequences as well. If federal regulations concerning medicines for human use were based on the precautionary principle (again, in the United States, they are not), then any medicine that could potentially harm any person would not be used. This would effectively ban nearly all medical trials leading to new medications.

What is the environment worth to you?

The environment, and its benefits to individuals or groups, can be viewed and justified from multiple perspectives. A **utilitarian justification** for environmental conservation means that we should protect the environment because doing so provides a direct economic benefit to people. For example, someone might propose not developing Georgia's coastal salt marshes because the young of many commercial fishes live in salt marshes and the fishers will collapse without this habitat. An **ecological justification** for environmental conservation means that we should protect the environmental because doing so will protect both species that are beneficial to other as well as other species and an ecological justification for conservation acknowledges the many ecosystem services that we derive from healthy ecosystems. For example, we should protect Georgia's coastal salt marshes because salt marshes purify water, salt marshes are vital to the survival of many marine fishes and salt marshes protect our coasts from storm surges. An **aesthetic justification** for conservation acknowledges that many people enjoy the outdoors and do not want to live in a world without wilderness. One could also think of this as recreational, inspirational, or spiritual justification for conservation. For example, salt marshes are beautiful places and I always feel relaxed and calm when I am visiting one, therefore we should protect salt marches. And finally a **moral justification** represents the belief that various aspects of the environment have a right to exist and that it is our moral obligation to allow them to continue or help them persist. Someone who was arguing for conservation using a moral justification would say that it is wrong to destroy the coastal salt marshes.

Global perspective

The solution to most environmental problems requires a global perspective. Human population size has now reached a scale where the environmental impacts are global in scale and will require multilateral solutions. You will notice this theme continue as you move through the next seven chapters of this text. As you do so, keep in mind that the set of environmental, regulatory, and economic circumstances common in the United States are not constant throughout the world. Be ready to investigate environmental situations and problems from a diverse set of viewpoints throughout this semester.

Parts of this chapter have been modified from the OpenStax textbooks.

Study questions

1. Why there was a need to study the impact of human population growth on the environment?
2. What does sustainability mean to you?
3. What are the consequences of unsustainable vs. sustainable living? What impacts do these have on quality of life do we want for us and future generations?
4. Think of an environmental problem that requires a global perspective for a solution. How might this problem be examined from a variety of environmental justification perspectives?

Websites for more information and further discussion

Information about the field of environmental science: http://www.environmentalscience.org/
"Process" of science http://undsci.berkeley.edu/

Terms list

Adenosine triphosphate
Aesthetic justification
Amino acid
Anthropogenic
Atom
ATP
Biome
Biosphere
Carbohydrate
Cellular respiration
Community
Competition
Control group
Denature
Deoxyribonucleic acid
Dependent variable
DNA
Ecological justification
Ecosystem
Ecosystem service
Electron
Element
Environment
Environmental engineering
Environmental science
Environmentalism
Experiment
Experimental group
Food web
Glucose
Hydrocarbon
Hypothesis
Independent variable
Interdisciplinary
Ion
IPAT equation
Isotope
Lipid
Matter
Molecule
Moral justification
Neutron
Nucleic acid
Nucleus
Organelle
Organic molecule
Organism
Population
Precautionary principle
Primary production
Protein
Proton
Radioisotope
Ribonucleic acid
RNA
Science
Scientific method
Starch
Succession
Sustainability
Sustainable development
Theory
Tripe bottom-line
Utilitarian justification
Variable

Chapter 2: Population Ecology

A population of elephants at Pinnewala Elephant Orphanage, Sri Lanka. Photo by Paginazero, Wikimedia commons.

A shoal of anchovies in Liguria, Italy. Photo by Alessandro Duci. Wikimedia commons.

Learning Outcomes - At the end of this, chapter students will be able to:

- Define the variables in the exponential and logistic growth equations.
- Use the exponential and logistic equations to predict population growth rate.
- Compare the environmental conditions represented by the exponential growth model vs. the logistic growth model.
- Define carrying capacity and be able to label the carrying capacity on a graph.
- Compare density-dependent and density-independent factors that limit population growth and give examples of each.
- Interpret survivorship curves and give examples of organisms that would fit each type of curve.

Chapter outline

2.1 Population Ecology 2
2.2 Population Growth Models 2
2.2.1 Exponential Growth 2
2.2.2 Logistic Growth 4
2.3 Factors limiting population growth 7
2.4 Life Tables and Survivorship 9

2.1 Population Ecology

Ecology is a sub-discipline of biology that studies the interactions between organisms and their environments. A group of interbreeding individuals (individuals of the same species) living and interacting in a given area at a given time is defined as a **population**. These individuals rely on the same resources and are influenced by the same environmental factors. **Population ecology,** therefore, is the study of how individuals of a particular species interact with their environment and change over time. The study of any population usually begins by determining how many individuals of a particular species exist, and how closely associated they are with each other. Within a particular habitat, a population can be characterized by its **population size** (***N***), defined by the total number of individuals, and its **population density**, the number of individuals of a particular species within a specific area or volume (units are number of individuals/unit area or unit volume). Population *size* and *density* are the two main characteristics used to describe a population. For example, larger populations may be more stable and able to persist better than smaller populations because of the greater amount of genetic variability, and their potential to adapt to the environment or to changes in the environment. On the other hand, a member of a population with low population density (more spread out in the habitat), might have more difficulty finding a mate to reproduce compared to a population of higher density. Other characteristics of a population include **dispersion** – the way individuals are spaced within the area; **age structure** – number of individuals in different age groups and; **sex ratio** – proportion of males to females; and growth – change in population size (increase or decrease) over time.

2.2 Population Growth Models

Populations change over time and space as individuals are born or immigrate (arrive from outside the population) into an area and others die or emigrate (depart from the population to another location). Populations grow and shrink and the age and gender composition also change through time and in response to changing environmental conditions. Some populations, for example trees in a mature forest, are relatively constant over time while others change rapidly. Using idealized models, population ecologists can predict how the size of a particular population will change over time under different conditions.

2.2.1 Exponential Growth

Charles Darwin, in his theory of natural selection, was greatly influenced by the English clergyman Thomas Malthus. Malthus published a book (An Essay on the Principle of Population) in 1798 stating that populations with unlimited natural resources grow very rapidly. According to the Malthus' model, once population size exceeds available resources, population growth decreases dramatically. This accelerating pattern of increasing population size is called **exponential growth,** meaning that the population is increasing by a fixed percentage each year. When plotted (visualized) on a graph showing how the population size increases over time, the result is a J-shaped curve (**Figure 2.1**). Each individual in the population reproduces by a certain amount (***r***) and as the population gets larger, there are more individuals reproducing by that same amount (the fixed percentage). In nature, exponential growth only occurs if there are no external limits.

One example of exponential growth is seen in bacteria. Bacteria are prokaryotes (organisms whose cells lack a nucleus and membrane-bound organelles) that reproduce by fission (each individual cell splits into two new cells). This process takes about an hour for many bacterial species. If 100 bacteria are placed in a large flask with an unlimited supply of nutrients (so the nutrients will not

become depleted), after an hour, there is one round of division and each organism divides, resulting in 200 organisms - an increase of 100. In another hour, each of the 200 organisms divides, producing 400 - an increase of 200 organisms. After the third hour, there should be 800 bacteria in the flask - an increase of 400 organisms. After ½ a day and 12 of these cycles, the population would have increased from 100 cells to more than 24,000 cells. When the population size, *N*, is plotted over time, a J-shaped growth curve is produced (**Figure 2.1**). This shows that the number of individuals added during each reproduction generation is accelerating – increasing at a faster rate.

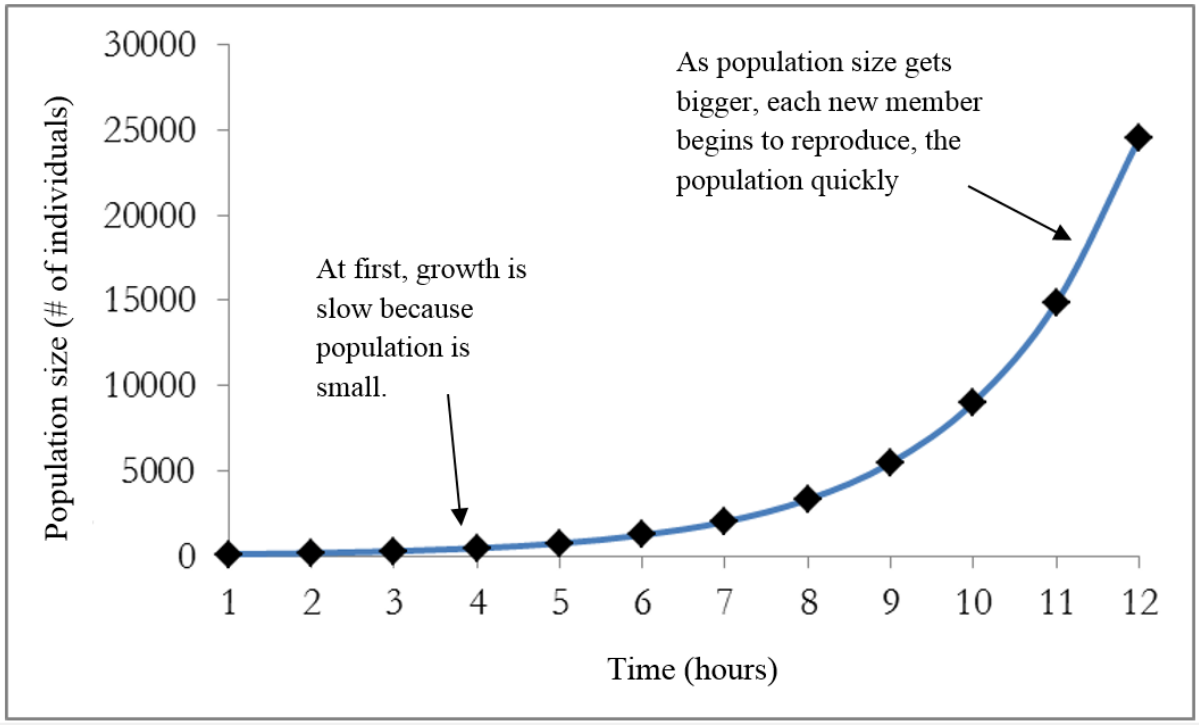


Figure 2.1: The "J" shaped curve of exponential growth for a hypothetical population of bacteria. The population starts out with 100 individuals and after 11 hours there are over 24,000 individuals. As time goes on and the population size increases, the rate of increase also increases (each step up becomes bigger). In this figure "r" is positive.

This type of growth can be represented using a mathematical function known as the **exponential growth model:**

$G = r \times N$ (also expressed as $dN/dt = r \times N$). In this equation

G (or ***dN/dt***) is the *population growth rate*, it is a measure of the number of individuals added per time interval time.

r is the *per capita rate of increase* (the average contribution of each member in a population to population growth; per capita means "per person").

N is the *population size*, the number of individuals in the population at a particular time.

Per capita rate of increase (r)

In exponential growth, the *population growth rate* (***G***) depends on population size (*N*) and the per capita rate of increase (*r*). In this model *r* does not change (fixed percentage) and change in population growth rate, **G**, is due to change in population size, ***N***. As new individuals are added to the population, each of the new additions contribute to population growth at the same rate (*r*) as the individuals already in the population.

r = (birth rate + immigration rate) – (death rate and emigration rate).

If *r* is positive (> zero), the population is increasing in size; this means that the birth and immigration rates are greater than death and emigration.

If *r* is negative (< zero), the population is decreasing in size; this means that the birth and immigration rates are less than death and emigration rates.

If *r* is zero, then the population growth rate (***G***) is zero and population size is unchanging, a condition known as zero population growth. "***r***" varies depending on the type of organism, for example a population of bacteria would have a much higher "***r***" than an elephant population. In the exponential growth model r is multiplied by the population size, *N*, so population growth rate is largely influenced by *N*. This means that if two populations have the same per capita rate of increase (*r*), the population with a larger *N* will have a larger population growth rate than the one with a smaller *N*.

2.2.2 Logistic Growth

Exponential growth cannot continue forever because resources (food, water, shelter) will become limited. Exponential growth may occur in environments where there are few individuals and plentiful resources, but soon or later, the population gets large enough that individuals run out of vital resources such as food or living space, slowing the growth rate. When resources are limited, populations exhibit **logistic growth.** In logistic growth a population grows nearly exponentially at first when the population is small and resources are plentiful but growth rate slows down as the population size nears limit of the environment and resources begin to be in short supply and finally stabilizes (zero population growth rate) at the maximum population size that can be supported by the environment (**carrying capacity**). This results in a characteristic S-shaped growth curve (**Figure 2.2**). The mathematical function or logistic growth model is represented by the following equation:

$$\boldsymbol{G = r * N * [1 - \frac{N}{K}]}$$

Where,
K is the *carrying capacity* – the maximum population size that a particular environment can sustain ("carry"). Notice that this model is similar to the exponential growth model except for the addition of the carrying capacity.

In the exponential growth model, population growth rate was mainly dependent on *N* so that each new individual added to the population contributed equally to its growth as those individuals previously in the population because per capita rate of increase is fixed. In the logistic growth model, individuals' contribution to population growth rate depends on the amount of resources available (K). As the number of individuals (N) in a population increases, fewer resources are available to each

individual. As resources diminish, each individual on average, produces fewer offspring than when resources are plentiful, causing the birth rate of the population to decrease.

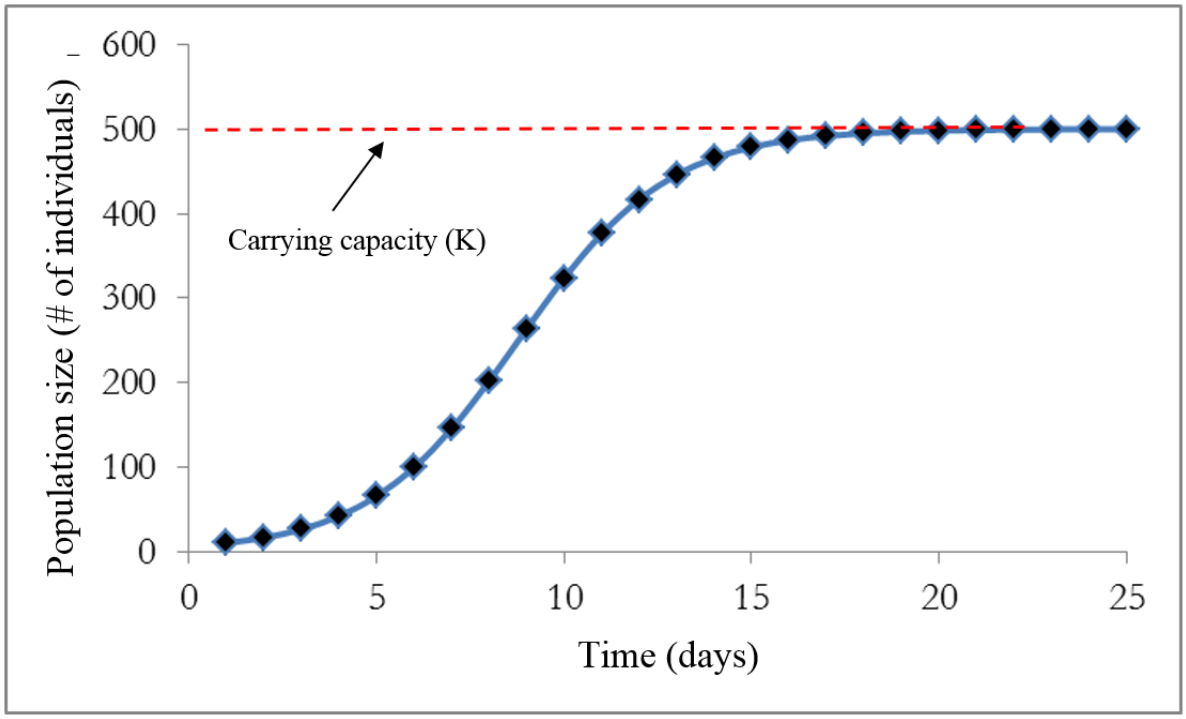
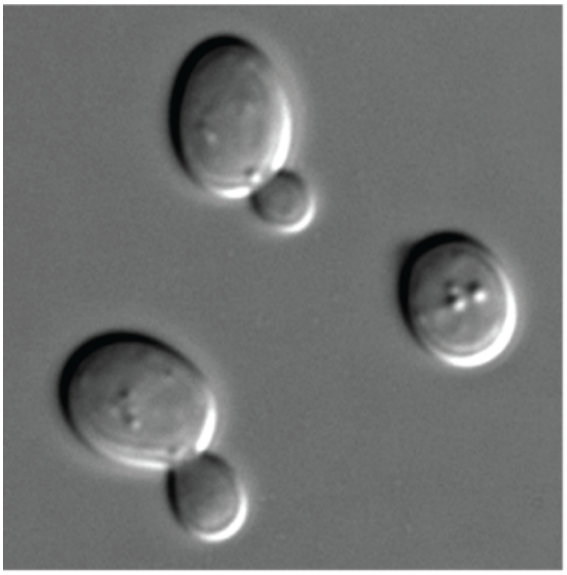


Figure 2.2: Shows logistic growth of a hypothetical bacteria population. The population starts out with 10 individuals and then reaches the carrying capacity of the habitat which is 500 individuals.

Influence of *K* on population growth rate

In the logistic growth model, the exponential growth (***r* * *N***) is multiplied by fraction or expression that describes the effect that limiting factors (***1 - N/K***) have on an increasing population. Initially when the population is very small compared to the capacity of the environment (*K*), 1 - N/K is a large fraction that nearly equals 1 so population growth rate is close to the exponential growth (r * N). For example, supposing an environment can support a maximum of 100 individuals and N = 2, N is so small that *1 – N/K* (1 – 2/100 = 0.98) will be large, close to 1. As the population increases and population size gets closer to carrying capacity (N nearly equals K), then 1 - N/K is a small fraction that nearly equals zero and when this fraction is multiplied by r * N, population growth rate is slowed down. In the earlier example, if the population grows to 98 individuals, which is close to (but not equal) K, then 1 – N/K (1 – 98/100 = 0.02) will be so small, close to zero. If population size equals the carrying capacity, N/K = 1, so 1 – N/K = 0, population growth rate will be zero (in the above example, 1 – 100/100 = 0). This model, therefore, predicts that *a population's growth rate will be small when the population size is either small or large, and highest when the population is at an intermediate level relative to K*. At small populations, growth rate is limited by the small amount of individuals (*N*) available to reproduce and contribute to population growth rate whereas at large populations, growth rate is limited by the limited amount of resources available to each of the large number of individuals to enable them reproduce successfully. In fact, *maximum population growth rate (**G**) occurs when N is half of K*.

Yeast is a microscopic fungus, used to make bread and alcoholic beverages, that exhibits the classical S-shaped logistic growth curve when grown in a test tube (**Figure 2.3**). Its growth levels off as the population depletes the nutrients that are necessary for its growth. In the real world, however, there are variations to this idealized curve. For example, a population of harbor seals may exceed the carrying capacity for a short time and then fall below the carrying capacity for a brief time period and as more resources become available, the population grows again (**Figure 2.4**). This fluctuation in population size continues to occur as the population oscillates around its carrying capacity. Still, even with this oscillation, the logistic model is exhibited.



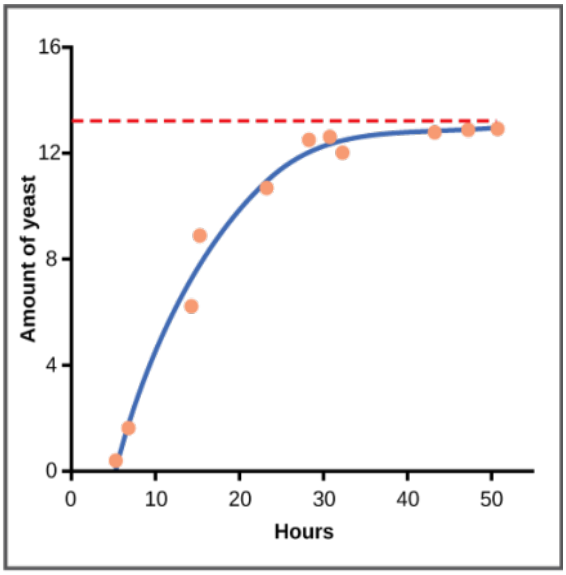


Figure 2.3: Graph showing amount of yeast versus time of growth in hours. The curve rises steeply, and then plateaus at the carrying capacity. Data points tightly follow the curve. The image is a micrograph (microscope image) of yeast cells

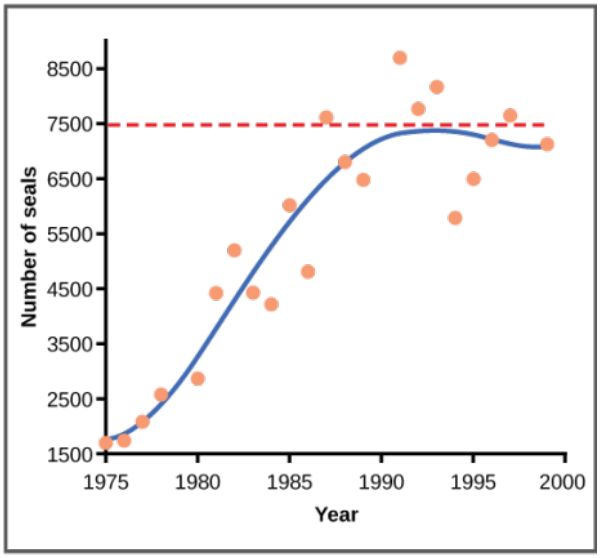


Figure 2.4: Graph showing the number of harbor seals versus time in years. The curve rises steeply then plateaus at the carrying capacity, but this time there is much more scatter in the data. A photo of a harbor seal is shown.

2.3 Factors limiting population growth

Recall previously that we defined density as the number of individuals per unit area. In nature, a population that is introduced to a new environment or is rebounding from a catastrophic decline in numbers may grow exponentially for a while because density is low and resources are not limiting. Eventually, one or more environmental factors will limit its population growth rate as the population size approaches the carrying capacity and density increases. Example: imagine that in an effort to preserve elk, a population of 20 individuals is introduced to a previously unoccupied island that's 200 km^2 in size. The population density of elk on this island is 0.1 elk/km^2 (or 10 km^2 for each individual elk). As this population grows (depending on its per capita rate of increase), the number of individuals increases but the amount of space does not so density increases. Suppose that 10 years later, the elk population has grown to 800 individuals, density = 4 elk/ km^2 (or 0.25 km^2 for each individual). The population growth rate will be limited by various factors in the environment. For example, birth rates may decrease due to limited food or death rate increase due to rapid spread of disease as individuals encounter one another more often. This impact on birth and death rate in turn influences the per capita rate of increase and how the population size changes with changes in the environment. When birth and death rates of a population change as the density of the population changes, the rates are said to be density-dependent and the environmental factors that affect birth and death rates are known as **density-dependent factors**. In other cases, populations are held in check by factors that are not related to the density of the population and are called **density-independent factors** and influence population size regardless of population density. Conservation biologists want to understand both types because this helps them manage populations and prevent extinction or overpopulation.

The density of a population can enhance or diminish the impact of *density-dependent* factors. Most density-dependent factors are *biological* in nature (biotic), and include such things as predation, inter- and intraspecific competition for food and mates, accumulation of waste, and diseases such as those caused by parasites. Usually, higher population density results in higher death rates and lower birth rates. For example, as a population increases in size food becomes scarcer and some individuals will die from starvation meaning that the death rate from starvation increases as population size increases. Also as food becomes scarcer, birth rates decrease due to fewer available resources for the mother meaning that the birth rate decreases as population size increases. For density-dependent factors, there is a feedback loop between population density and the density-dependent factor.

Two examples of density-dependent regulation are shown in **Figure 2.5**. First one is showing results from a study focusing on the giant intestinal roundworm (*Ascaris lumbricoides*), a parasite that infects humans and other mammals. Denser populations of the parasite exhibited lower fecundity (number of eggs per female). One possible explanation for this is that females would be smaller in more dense populations because of limited resources and smaller females produce fewer eggs.

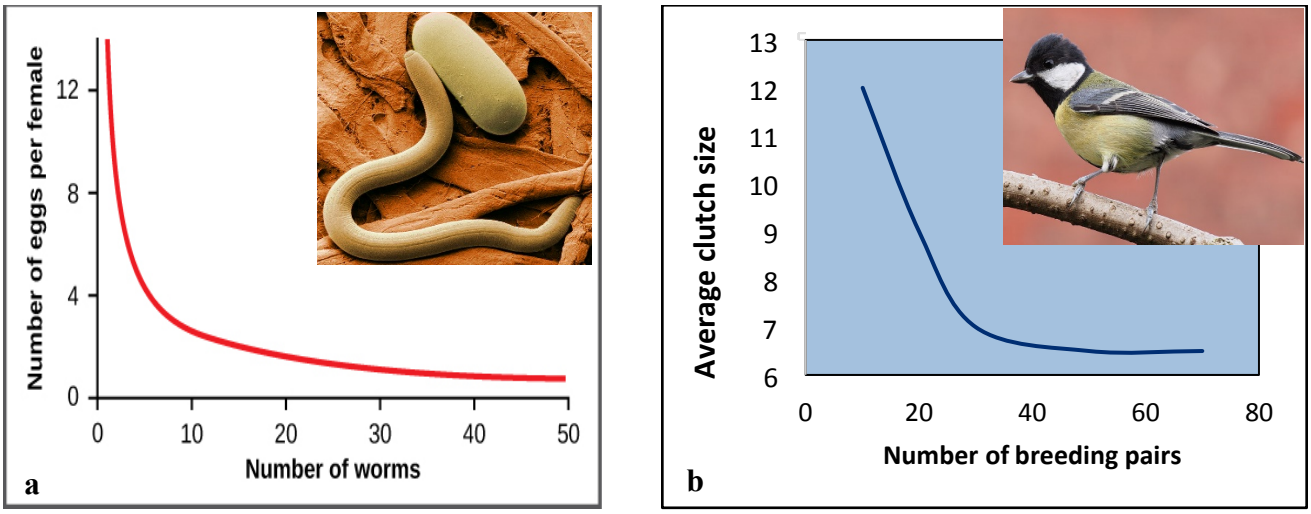


Figure 2.5: (**a**) Graph of number of eggs per female (fecundity), as a function of population size. In this population of roundworms, fecundity (number of eggs) decreases with population density. (**b**) Graph of clutch size (number of eggs per "litter") of the great tits bird as a function of population size (breeding pairs). Again, clutch size decreases as population density increases. (Photo credits: Worm image from Wikimedia commons, public domain image; bird image from Wikimedia commons, photo by Francis C. Franklin / CC-BY-SA-3.0)

Density-independent birth rates and death rates do NOT depend on population size; these factors are independent of, or not influenced by, population density. Many factors influence population size regardless of the population density, including weather extremes, natural disasters (earthquakes, hurricanes, tornadoes, tsunamis, etc.), pollution and other physical/abiotic factors. For example, an individual deer may be killed in a forest fire regardless of how many deer happen to be in the forest. The forest fire is not responding to deer population size. As the weather grows cooler in the winter, many insects die from the cold. The change in weather does not depend on whether there is a population size of 100 mosquitoes or 100,000 mosquitoes, most mosquitoes will die from the cold regardless of the population size and the weather will change irrespective of mosquito population density. Looking at the growth curve of such a population would show something like an exponential growth followed by a rapid decline rather than levelling off (**Figure 2.6**).

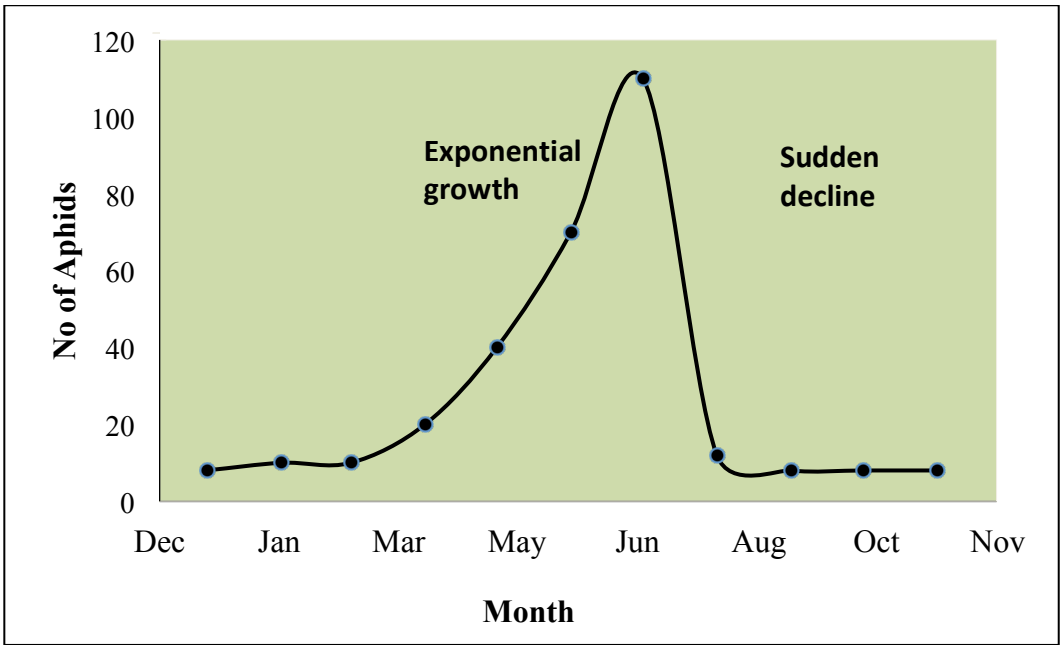


Figure 2.6: Weather change acting as a density-independent factor limiting aphid population growth. This insect undergoes exponential growth in the early spring and then rapidly die off when the weather turns hot and dry in the summer

In real-life situations, density-dependent and independent factors interact. For example, a devastating earthquake occurred in Haiti in 2010. This earthquake was a natural geologic event that caused a high human death toll from this *density-independent event*. Then there were high densities of people in refugee camps and the high density caused disease to spread quickly, representing a *density-dependent* death rate.

Q: Can you think of other *density-dependent* (biological) and *density-independent* (abiotic) population limiting factors?

2.4 Life Tables and Survivorship

Population ecologists use life tables to study species and identify the most vulnerable stages of organisms' lives to develop effective measures for maintaining viable populations. Life tables, like **Table 2.1**, track **survivorship**, the chance of an individual in a given population surviving to various ages. Life tables were invented by the insurance industry to predict how long, on average, a person will live. Biologists use a life table as a quick window into the lives of the individuals of a population, showing how long they are likely to live, when they'll reproduce, and how many offspring they'll produce. Life tables are used to construct **survivorship curves**, which are graphs showing the proportion of individuals of a particular age that are now alive in a population. Survivorship (chance of surviving to a particular age) is plotted on the y-axis as a function of age or time on the x-axis. However, if the percent of maximum lifespan is used on the x-axis instead of actual ages, it is possible to compare survivorship curves for different types of organisms (**Figure 2.7**). All survivorship curves start along the y-axis intercept with all of the individuals in the population (or 100% of the individuals

surviving). As the population ages, individuals die and the curves goes down. A survivorship curve never goes up.

Table 2.1: Life Table for the U.S. population in 2011 showing the number who are expected to be alive at the beginning of each age interval based on the death rates in 2011. For example, 95,816 people out of 100,000 are expected to live to age 50 (0.983 chance of survival). The chance of surviving to age 60 is 0.964 but the chance of surviving to age 90 is only 0.570.

Age (years)	Number Living at Start of Age Interval	Number Dying During Interval	Chance of Surviving Interval	Chance of Dying During Interval
0-1	100000	606	0.993942	0.006058
1-5	99394	105	0.998946	0.001054
5-10	99289	60	0.999397	0.000603
10-15	99230	70	0.999291	0.000709
15-20	99159	242	0.997562	0.002438
20-25	98917	425	0.995704	0.004296
25-30	98493	475	0.995176	0.004824
30-35	98017	553	0.994362	0.005638
35-40	97465	681	0.993015	0.006985
40-45	96784	968	0.989994	0.010006
45-50	95816	1535	0.983982	0.016018
50-55	94281	2306	0.975541	0.024459
55-60	91975	3229	0.964895	0.035105
60-65	88746	4378	0.950668	0.049332
65-70	84368	6184	0.926698	0.073302
70-75	87184	8670	0.889101	0.110899
75-80	69513	12021	0.827073	0.172927
80-85	57493	15760	0.725879	0.274121
85-90	41733	17935	0.570241	0.429759
90-95	23798	14701	0.382258	0.617742
95-100	9097	7169	0.211924	0.788076
100 and over	1928	1928	0	1.000000

SOURCE: CDC/NCHS, National Vital Statistics System.

Survivorship curves reveal a huge amount of information about a population, such as whether most offspring die shortly after birth or whether most survive to adulthood and likely to live long lives. They generally fall into one of three typical shapes, Types I, II and III (**Figure 2.7a**). Organisms that exhibit **Type I** survivorship curves have the highest probability of surviving every age interval until old age, then the risk of dying increases dramatically. Humans are an example of a species with a Type I survivorship curve. Others include the giant tortoise and most large mammals such as elephants. These organisms have few natural predators and are, therefore, likely to live long lives. They tend to produce only a few offspring at a time and invest significant time and effort in each offspring, which increases survival.

In the **Type III** survivorship curve most of the deaths occur in the youngest age groups. Juvenile survivorship is very low and many individuals die young but individuals lucky enough to survive the first few age intervals are likely to live a much longer time. Most plants species, insect

species, frogs as well as marine species such as oysters and fishes have a Type III survivorship curve. A female frog may lay hundreds of eggs in a pond and these eggs produce hundreds of tadpoles. However, predators eat many of the young tadpoles and competition for food also means that many tadpoles don't survive. But the few tadpoles that do survive and metamorphose into adults then live for a relatively long time (for a frog). The mackerel fish, a female is capable of producing a million eggs and on average only about 2 survive to adulthood. Organisms with this type of survivorship curve tend to produce very large numbers of offspring because most will not survive. They also tend not to provide much parental care, if any.

Type II survivorship is intermediate between the others and suggests that such species have an even chance of dying at any age. Many birds, small mammals such as squirrels, and small reptiles, like lizards, have a Type II survivorship curve. The straight line indicates that the proportion alive in each age interval drops at a steady, regular pace. The likelihood of dying in any age interval is the same.

In reality, most species don't have survivorship curves that are definitively type I, II, or III. They may be anywhere in between. These three, though, represent the extremes and help us make predictions about reproductive rates and parental investment without extensive observations of individual behavior. For example, humans in less industrialized countries tend to have higher mortality rates in all age intervals, particularly in the earliest intervals when compared to individuals in industrialized countries. Looking at the population of the United States in 1900 (**Figure 2.7b**), you can see that mortality was much higher in the earliest intervals and throughout, the population seemed to exhibit a type II survivorship curve, similar to what might be seen in less industrialized countries or amongst the poorest populations.

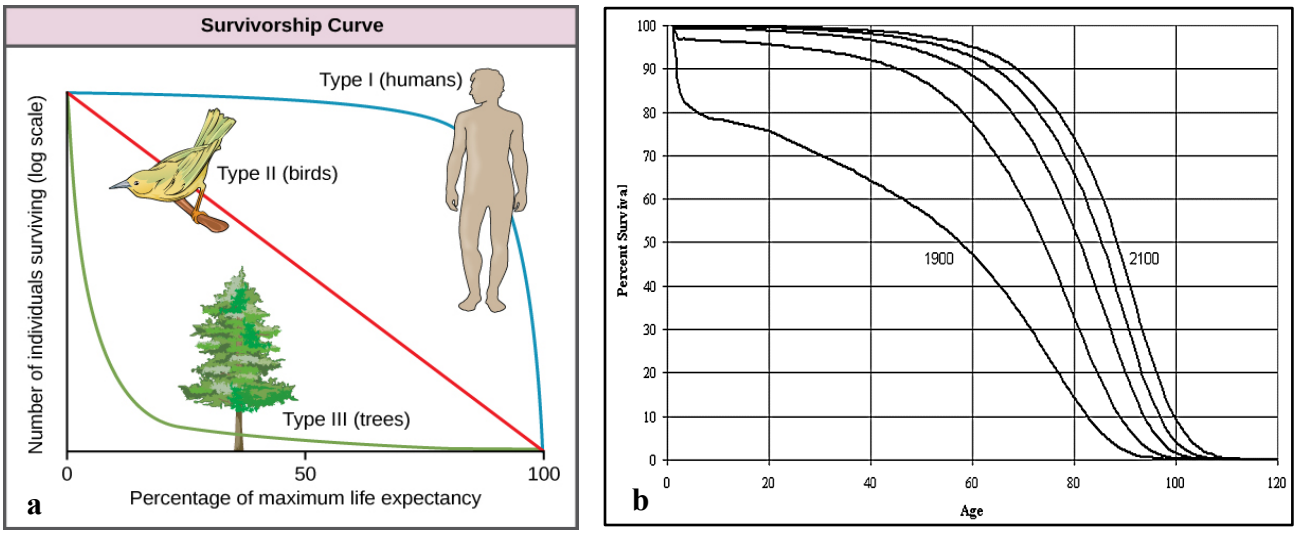


Figure 2.7: (**a**) Survivorship curves show the distribution of individuals in a population according to age. Humans and most large mammals have a Type I survivorship curve because most death occurs in the older years. Birds have a Type II survivorship curve, as death at any age is equally probable. Trees have a Type III survivorship curve because very few survive the younger years, but after a certain age, individuals are much more likely to survive. (**b**) Survivoship curves for the US population for 1900, 1950, 2000, 2050, 2100 *SOURCE: www.ssa.gov*.

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This material has been modified from the OpenStax Biology textbook.

POPULATION ECOLOGY PRACTICE PROBLEMS

1. If a population is experiencing exponential growth, what happens to **N**, ***r*** and **G** over time (increase, decrease or stay the same)?

2. At the beginning of the year, there are 7650 individuals in a population of beavers whose per capita rate of increase for the year is 0.18. What is its population growth rate at the end of the year?

3. A zebrafish population of 1000 individuals lives in an ecosystem that can support a maximum of 2000 zebrafish. The per capita rate of increase for the population is 0.01 for the year. What is the population growth rate?

4. In a scenario where: ***r*** = 0.25; **K** = 18,000;
    a. What is **G** when i) **N** = 4,500; ii) N = 9,000; and iii) **N** = 13,500?
    b. Which **N** level results in the highest population growth rate and why?

5. A chipmunk population is experiencing exponential growth with a population growth rate of 265 individuals/year, and a per capita rate of increase of 0.15. How many chipmunks are currently in this population?

6. Scientists discovered a new species of frog and were able to estimate its population at 755 individuals. At the end of the year, 105 frogs were added to this population. Assuming the population is undergoing exponential growth, what is the per capita rate of increase?

Test your skills (extra challenge)

7. At the beginning of the year, a wildlife area that is 1,000,000 ha in size has a population of 90 Brown bears with a per capita growth rate of 0.02. It's estimated that brown bears **<u>need</u>** a territory of about 10 km^2 per individual (**note**: 1 km^2 = 100 ha). Use this information to answer the following questions.
    a. What is the density of brown bears in this wildlife preserve currently?
    b. What is the *carrying capacity* of the preserve?
    c. What is the population growth rate for this year?

8. A wildlife ranch currently has a population of polar bears whose death rate is 0.05 and birth rate is 0.12 per year. This particular ranch is isolated from other suitable habitats so there's no immigration into or emigration from this population. This population is experiencing logistic growth and currently has 550 bears. If the population growth rate for the year was 36 bears, what is the carrying capacity of the preserve?

Chapter 3: Human Demography

By the end of this chapter, you will be able to:

- State the current size of the human population.
- Interpret age-structure diagrams.
- Explain what the demographic transition model represents and describe the societal changes that cause the demographic transition.
- Describe what happens to birth rates, death rates, population growth rate, and population size as a country moves through the stages of the demographic transition model.
- Give examples of countries in the different stages of the demographic transition models and match age-structure diagrams with the stages of the demographic transition model.
- Define life expectancy and explain how it changes as a country moves through the demographic transition model.
- Define fertility and explain how it changes as a country moves through the demographic transition model.

Chapter outline

1. The human population
2. Demography
3. Age structure diagrams
4. The demographic transition model
5. Life expectancy
6. Fertility

3.1 The human population.

The human population is growing rapidly. For most of human history, there were fewer than 1 billion people on the planet. During the time of the agricultural revolution, 10,000 B.C., there were only 5-10 million people on Earth - which is basically the population of New York City today. In 1800, when the Industrial Revolution began, there were approximately 1 billion people on Earth (Figure 3.1). We've added 6 billion people to the human population in just a little over 200 years. This demonstrates the capacity of the human population to exhibit exponential growth (Chapter 2).

What is the current human population? Use this World population clock link to determine the current human population: http://math.berkeley.edu/~galen/popclk.html

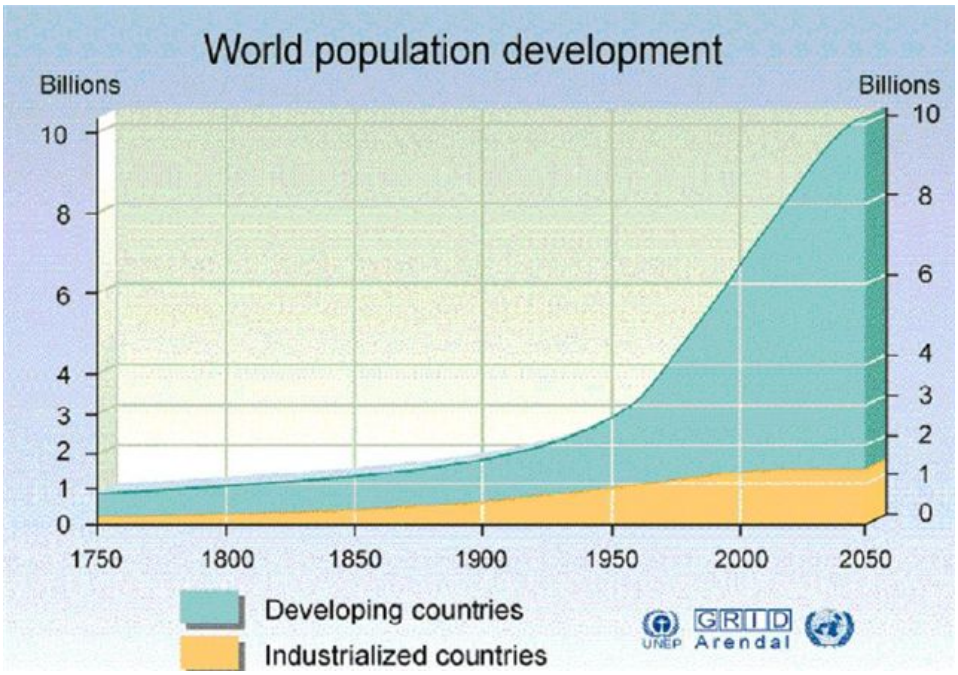

Figure 3.1: Shows the increase in human population size starting in 1750 and predicted out to 2050. The orange area represents the human population in industrialized countries and the blue/green area represents the human population in less-industrialized (developing) countries. The greatest amount of human population growth will be in less-industrialized countries.

3.2 Demography

Demography applies the principles of population ecology (chapter 2) to the human population. Demographers study how human populations grow, shrink, and change in terms of age and gender compositions. Demographers also compare populations in different countries or regions.

3.3 Age structure diagrams

One of the tools that demographers use to understand populations is the **age structure diagram**. This diagram shows the distribution by ages of females and males within a certain population in graphic form. Figure 3.2 shows a diagram for the United States population. In this diagram, the ages are arranged so that age ranges are grouped together, for example: 0 – 4 years, 5 – 9 years, and so on. The population of each group is represented as a bar extending from a central vertical line, with the length of each bar dependent upon the total population for that particular group. The centerline separates the females from the males. The female and male populations for each group are represented by the distance from the centerline, with females on the right and males on the left.

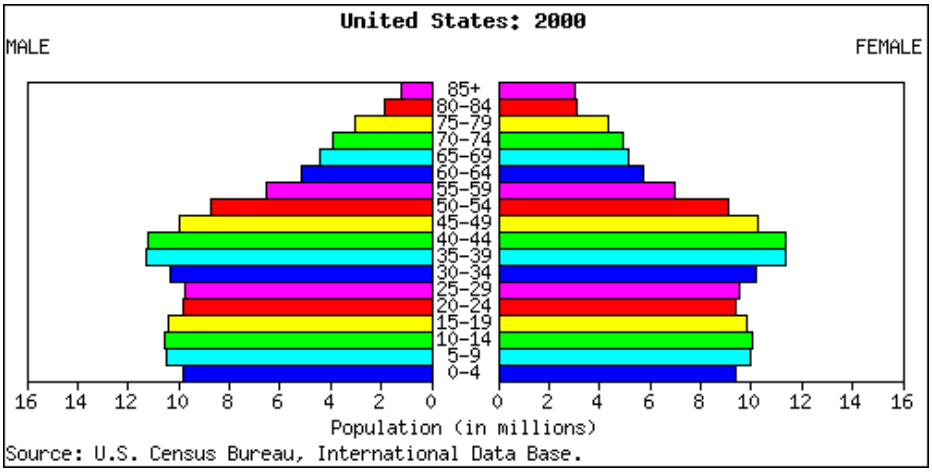

Figure 3.2: Age Structure diagram for the U.S. in 2000

By looking closely at the age structure diagram, one will notice slightly more boys in the younger age groups than girls; however, the ratio tends to reverse in the upper age groups, when females tend to outnumber males. Many countries have a female majority as a result of the longer life expectancy for females.

The following age structure diagrams (Figure 3.3) show the United States in 2005 and 2010. Please note the slightly different x-axes scale on these diagrams compared to the 2000 diagram above (Figure 3.2). You can see the aging group of baby boomers move upward when you compare these 3 age structure diagrams. There are also more elderly (80+) individuals, especially women, in 2005 and 2010.

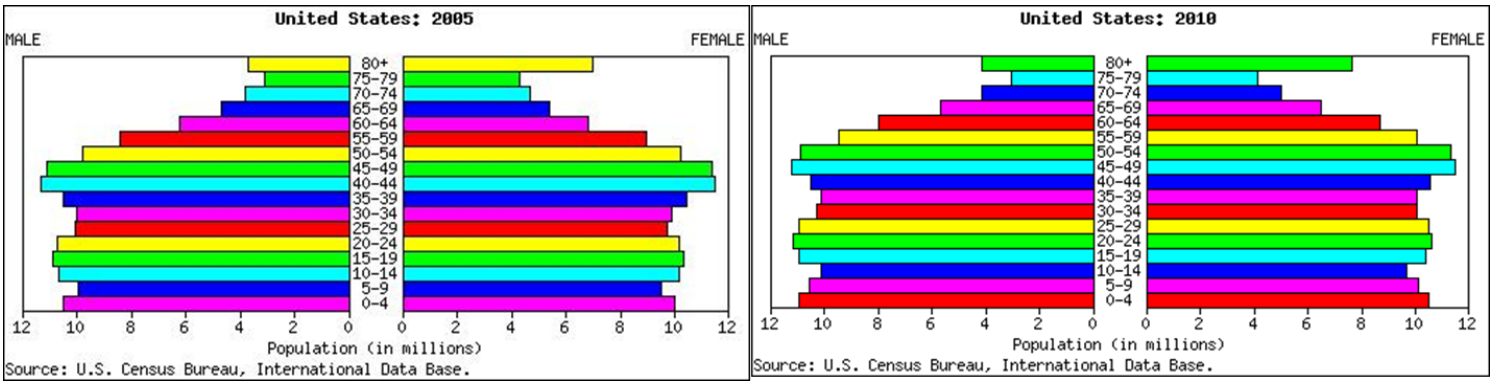

Figure 3.3: Age Structure diagram for the U.S. in 2005 and 2010.

An age-structure diagram provides a snapshot of the current population and can represent information about the past and give potential clues about future problems. When you are interpreting age-structure diagrams, it is important to compare the width of the base to the rest of the population. If the base is very wide compared to the upper parts of the diagram, then this indicates a lot of young people (pre-reproductive) in the population compared to older generations i.e. a high birth rate and a rapidly growing population. If the base is smaller than the upper parts of the diagram, then this indicates few young people in the population compared to older generations (post-reproductive). This population has low birth rates and is shrinking.

3.4 The Demographic Transition Model

The demographic transition model shows the changes in the patterns of birth rates and death rates that typically occur as a country moves through the process of industrialization or development. The demographic transition model was built based on patterns observed in European counties as they were going through industrialization. This model can be applied to other countries, but not all countries or regions fit the model exactly. And the pace or rate at which a country moves through the demographic transition varies among countries.

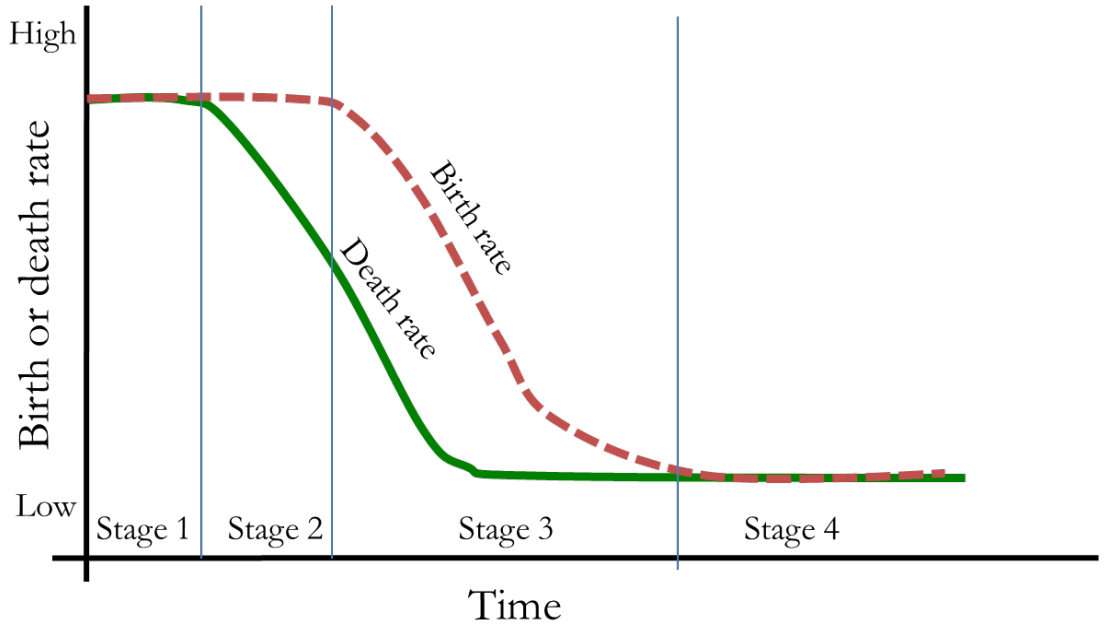

Figure 3.4: The demographic transition model shows how birth rates and death rates change over time as a country becomes more developed. The demographic transition model is typically divided into four stages. The green line represents death rates and the dashed red line represents birth rates.

In the demographic transition model, a country begins in Stage 1, the preindustrial stage. In Stage 1 (Figure 3.4), both birth rates and death rates are high. The high death rates are because of disease and potential food scarcity. A country in Stage 1 of the demographic transition model does not have good health care; there may not be any hospitals or doctors. Children are not vaccinated against common diseases and therefore many children die at a young age. Infant and childhood **mortality rates** (death rates) are very high. A society in Stage 1 is likely based upon agriculture and most people grow their own food. Therefore, droughts or flood can lead to widespread food shortages and death from famine. All of these factors contribute to the high death rate in Stage 1. Partly to compensate for the high death rates, birth rates are also high. High birth rates mean that families are large and each couple, on average, has many children. When death rates are high, having many children means that at least one or two will live to adulthood. In Stage 1, children are an important part of the family workforce and are expected to work growing food and taking care of the family.

As you are examining the stages of the demographic transition model, remember that:

Population Growth Rate = Birth Rate – Death Rate

In Stage 1, birth rates are high, but death rates are high as well. Therefore, population growth rate is low or close to zero (Figure 3.5).

As a country develops, medical advances are made such as access to antibiotics and vaccines. Sanitation improvements, such as proper waste and sewage disposal, and water treatment for clean drinking water also progress. Food production also increases. Together these changes lead to falling death rates which marks the beginning of Stage 2 (Figure 3.4). Death rates continue to fall throughout Stage 2 as conditions improve. This means that people are living longer and childhood morality drops. However, birth rates are still high in Stage 2. There is a time lag between the improving conditions and any subsequent changes in family size, so women are still having many children and now more of these children are living into adulthood. In Stage 2, the birth rate is higher than the death rate, so population growth rate is high. This means that population size increases greatly during Stage 2 of the demographic transition model (Figure 3.5).

A falling birth rate marks the beginning of Stage 3 in the demographic transition model. As a country continues to industrialize, many women join the workforce. Additionally, raising children becomes more expensive and children no longer work on the family farm or make large economic contributions to the family. Individuals may have access to birth control and choose to have fewer children. This leads to a drop in birth rates and smaller family sizes. Death rates also continue to drop during Stage 3 as medicine, sanitation and food security continue to improve. Even though both birth rates and death rates are falling throughout Stage 3, birth rates are higher than death rates. This means that population growth rate is high and that population size continues to increase in Stage 3 of the demographic transition model (Figure 3.5).

Birth rate and death rates drop to low, stable, approximately equal levels in Stage 4. Death rates are low because of medical advances, good sanitation, clean drinking water and food security. Birth rates are low because of access to birth control and many women delay having their first child until they have worked. Childhood mortality is low, life expectancy is high, and family size is approximately two children per couple. With low birth rates and low death rates, population growth rate is approximately zero in Stage 4 (Figure 3.5).

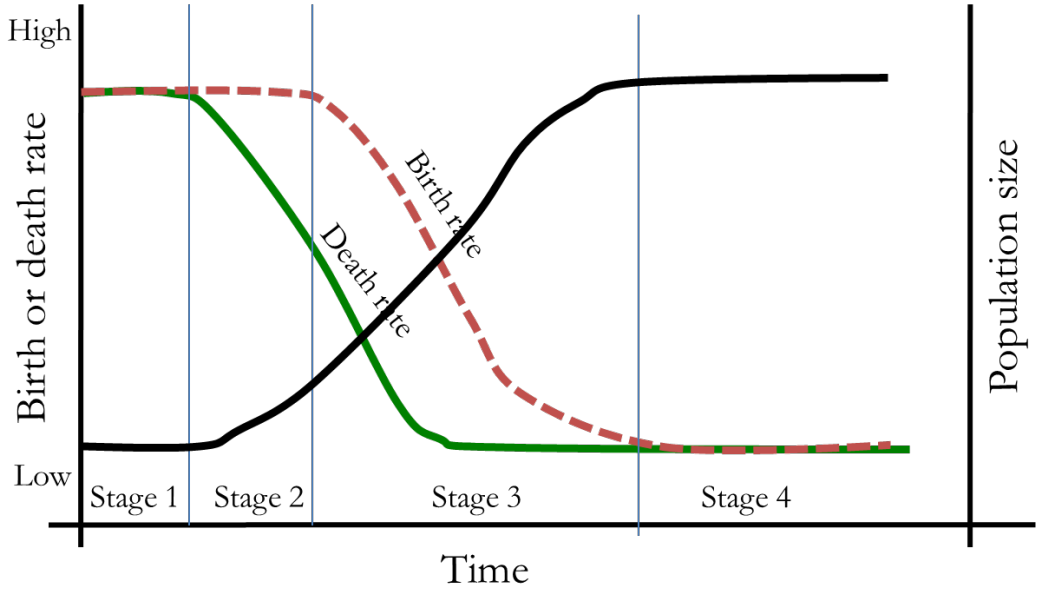

Figure 3.5: This figure repeats the demographic transition model of Figure 3.4, with the changes in population size (y-axes on the far right) shown by the black line. Population size is low and stable in Stage 1, increases

rapidly in Stage 2 and 3 because birth rates are higher than death rates, and then is high and stable again in Stage 4.

3.5 Life expectancy

Life expectancy is the average number of years that a person in a particular population is expected to live. Life expectancy at birth is the number of years a newborn infant would live if mortality rates at the time of its birth did not change. For example, the life expectancy at birth for someone born in 2014 in Japan is 84.46 years while the life expectancy at birth for someone born in the United States in 2014 is 79.56 years (source: https://www.cia.gov). As a country moves through the demographic transition model, life expectancy increases. Overall, life expectancy has increased for most countries and regions over the past 100 years. However, there is still a significant amount of variation in life expectancy in different regions of the world.

Use this World Health Organization interactive map to compare life expectancy among different countries: http://gamapserver.who.int/gho/interactive_charts/mbd/life_expectancy/atlas.html

What other countries have a life expectancy at birth similar to the United States? List two countries that have a higher life expectancy and two countries that have a lower life expectancy than the United States.

3.6 Fertility

Fertility is the actual level of reproduction of a population per individual, based on the number of live births that occur. Total fertility is the average number of children born to each woman, over the woman's lifespan, in a population. Birth rate and fertility are closely linked terms. As a country moves through the demographic transition model, fertility rates decrease. Overall, fertility rates have decreased for most countries and regions over the past 50 years (Figure 3.6). However, there is still a significant amount of variation among different regions of the world.

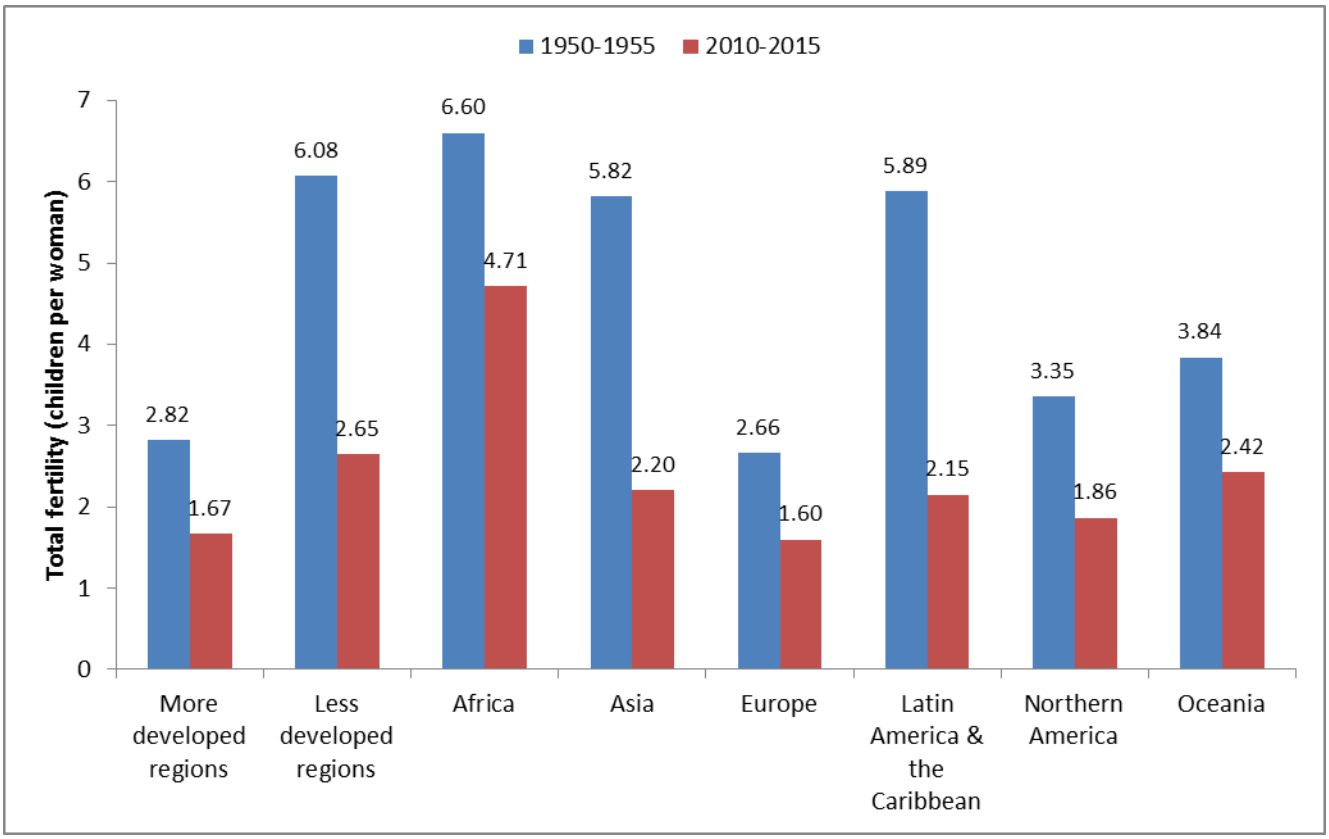

Figure 3.6: Shows the total fertility of different regions of the world. The blue bars are the total fertility estimates from 1950-1955. The red bars are the total fertility estimates from 2010-2015. More developed regions include Europe, Northern America (US and Canada), Australia, New Zealand and Japan. Less developed regions comprise all regions of Africa, Asia (except Japan), Latin America and the Caribbean plus Melanesia, Micronesia and Polynesia. Oceania includes Australia, New Zealand, Melanesia, Micronesia and Polynesia. Data are from the United Nations, Department of Economic and Social Affairs, Population Division. World Population Prospects, 2015 Revision. UN http://esa.un.org/unpd/wpp/DVD/

Additional recourses

United Nations Development Programme, Human Development Reports
http://hdr.undp.org/en/content/demography-and-human-development

Carrying capacity of ecosystems and human demography

http://institutmichelserres.ens-lyon.fr/spip.php?article38

Terms list

Age structure diagram

Demography

Demographic transition model

Fertility

Life expectancy

Mortality rate

Population growth rate

Pre-reproductive/post-reproductive age

CHAPTER 4: NON-RENEWABLE ENERGY

Watts Bar Nuclear Power Plant in East Tennessee. Image from Tennessee Valley Authority (Public Domain).

Chapter outline

4.1 What is Energy?
4.2 Fossil Fuels
4.3 Coal
4.4 Oil
4.5 Natural gas
4.6 Fossil fuels and greenhouse gases
4.7 Nuclear energy

Learning Objectives

By the end of this chapter, students will be able to

- List specific examples of non-renewable energy sources
- Explain what makes an energy source non-renewable
- Describe the main types of fossil fuels and how they formed
- Explain the environmental impacts associated with exploration, extraction and use of the different types of fossil fuels
- Explain nuclear energy, how it works, its benefits and risks

4.1 What is Energy?

Energy is the ability of a system to do work. A system has done work if it has exerted a force on another system over some distance. When this happens, energy is transferred from one system to another. At least some of the energy is also transformed from one type to another during this process. One can keep track of how much energy transfers into or out of a system. There are two categories that all energy falls into: kinetic and potential. **Kinetic energy** refers to types of energy associated with motion (Figure 4.1, top). For example, a rock rolling down a hill, the wind blowing through trees, water flowing over a dam, and a cyclist riding a bicycle are just a few examples of kinetic energy. **Potential energy** is energy possessed by an object or system due to its position in space relative to another object or system and forces between the two (Figure 4.1, bottom). Examples include a rock poised at the top of a hill and water stored behind a dam. Some forms of energy are part kinetic and part potential energy. **Chemical energy** describes the *potential* of a chemical substance to undergo a chemical reaction and transform other chemical substances; hence it is a form of potential energy. Examples include energy stored in the food you eat and the gasoline that you put in your car.

Examples of different forms of **kinetic** energy

Examples of different forms of **potential** energy

Figure 4.1: Examples kinetic (top) and potential (bottom) forms of energy. *All images were obtained from Wikimedia commons (public domain).*

Living organisms need energy to perform life-sustaining "work" in order to survive. For nearly all living systems on Earth, the sun is the ultimate source of that energy. Over time, we humans have developed an understanding of energy that has allowed us to harness it for uses well beyond basic survival. The development and evolution of human society is largely attributed to our relationship with energy. The first major advancement in human understanding

of energy was the mastery of fire for cooking and heating. Modern civilization is especially dependent on energy and some of its most distinct characteristics such as population growth, environmental impact and climate change are all a consequence of energy use. We use energy to heat and light our homes; power our machinery; fuel our vehicles; produce plastics, pharmaceuticals, and synthetic fibers; and provide the comforts and conveniences to which we have grown accustomed in the industrial age. Societal complexity, affluence, and the gap between poor and rich peoples are all related to our level of energy consumption.

4.2 Fossil Fuels

Fossil fuels is the term given to energy sources with a high **hydrocarbon** content (see Chapter 1 for a review of hydrocarbon molecules) found in the Earth's crust that formed in the geologic past and can be burned to release their energy. They were formed from prehistoric plants and animals that lived hundreds of millions of years ago (100 – 500 million years ago). When these ancient living organisms died they were quickly buried and subjected to immense pressure from overlying earth materials including layers of mud, rock, sand, and sometimes surface water bodies such as oceans and lakes.

During the millions of years that passed, the dead plants and animals slowly decomposed in **anaerobic** (very low to no oxygen) conditions and their chemical energy became concentrated. The organic compounds that once made up tissues of these organisms were chemically changed under high pressures and temperatures. While some fossil fuels may be in the process of formation today, the amount of time required for usable quantities to form is measured in millions of years, so these fuels will never be available for us. Thus for all practical purposes we consider fossil fuels to be finite and **non-renewable.**

4.2.1 Fossil Fuel Types and Formation

There are three main types of fossil fuels – natural gas, oil, and coal – and the specific type formed depends on the combination of organic matter that was present, how long it was buried and what temperature and pressure conditions existed when they were decomposing. **Oil** and **natural gas** were created from organisms that lived in water and were buried under ocean or river sediments. Long after the great prehistoric seas and rivers vanished, heat, pressure, and bacteria combined to compress and transform the organic material under layers of silt or shale rock (Figure 4.2). In most areas, a thick liquid called oil formed first, but in deeper, hot regions underground, the transformation process continued until natural gas was formed. Over time, some of this oil and natural gas began working its way upward through the earth's crust until they ran into rock formations called "**caprocks**" that are dense enough to prevent them from seeping to the surface. It is from under these caprocks that most oil and natural gas is retrieved today.

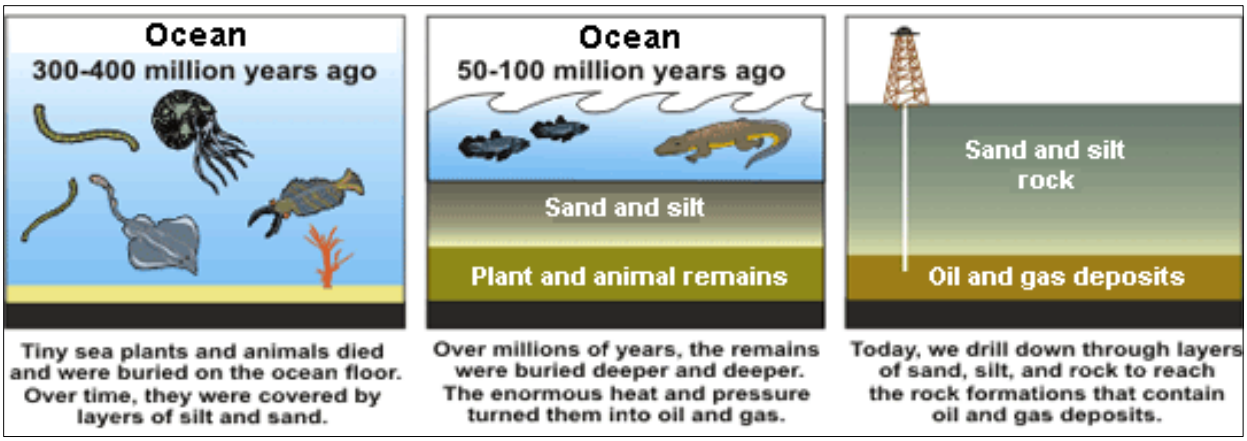

Figure 4.2: Oil and natural gas (petroleum) formation. *Source*: U.S. Energy Information Administration. http://www.eia.gov/energyexplained/index.cfm?page=natural_gas_home

Coal is a fossil fuel that formed from the remains of trees, ferns, and other plants that lived 300 to 400 million years ago (Figure 4.3). In some areas, such as portions of what is now the eastern United States, coal was formed from swamps covered by sea water. The sea water contained a large amount of sulfur, and as the seas dried up, the sulfur was left behind in the coal. Scientists are working on ways to take the sulfur out of coal because when coal burns, the sulfur is released in to the atmosphere as an air pollutant (see Chapter 6). Some coal deposits, however, were formed from freshwater swamps which had very little sulfur in them. These coal deposits, located largely in the western part of the United States, have much less sulfur in them.

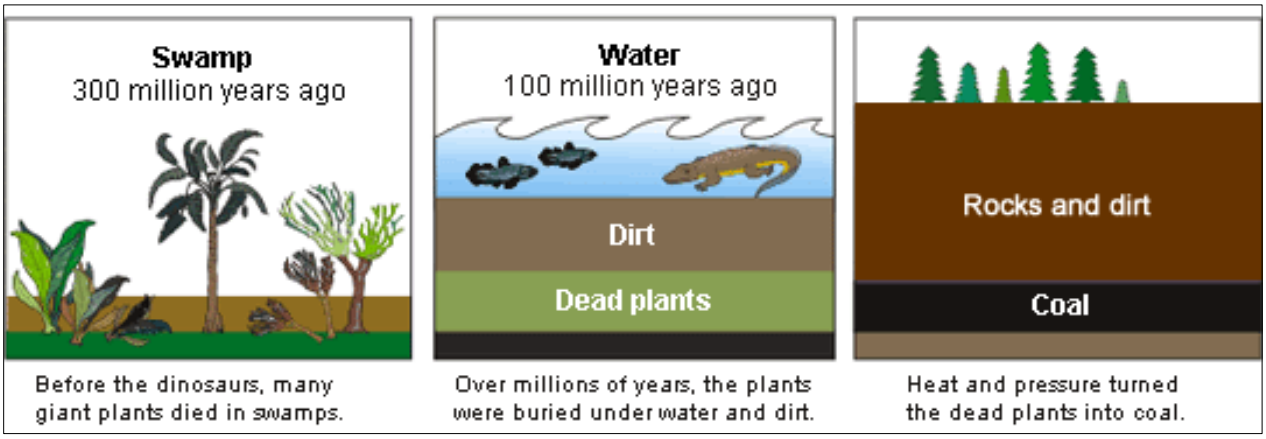

Figure 4.3: The process of coal formation. ***Source:*** U.S. Energy Information Administration.

4.2.2 Consumption

Historically, human prosperity has been directly correlated with energy use. The health and vitality of world societies critically depends on energy, most of which comes from fossil fuels (Figure 4.4). Energy resources, however, are unevenly distributed throughout the world, and so are the consumption rates. Developed regions generally consume far more energy than the developing regions. For example, the United States has only about 5% of the world's population but constitutes over 20% of the world's energy consumption. Additionally,

developing countries devote a larger proportion of energy consumption to subsistence activities such as growing and preparing food, and heating homes. Industrialized nations rely more on mechanized equipment and technology and, therefore, a greater proportion of their energy consumption goes to transportation and industry.

Fossil fuels can be utilized without being converted or transformed to another form of energy, this is referred to as **primary energy** consumption. In their primary form, fossil fuels can be used for transportation, heating and cooking, or used to generate electricity. The use of **electricity** is a form of **secondary energy** consumption. Transforming fossil fuel energy into electricity allows for easier transportation over long distances and application to a variety of uses. Additionally, there are four major sectors that consume energy: 1) The *industrial sector* which includes facilities and equipment used for manufacturing, agriculture, mining, and construction; 2) The *transportation sector* includes vehicles that transport people or goods including cars, trucks, buses, motorcycles, trains, aircraft, boats, barges, and ships; 3) The *residential sector* consists of homes and apartments; 4) The *commercial sector* includes offices, malls, stores, schools, hospitals, hotels, warehouses, restaurants, places of worship, and more. Each of these sectors also consumes electricity produced by the electric power sector.

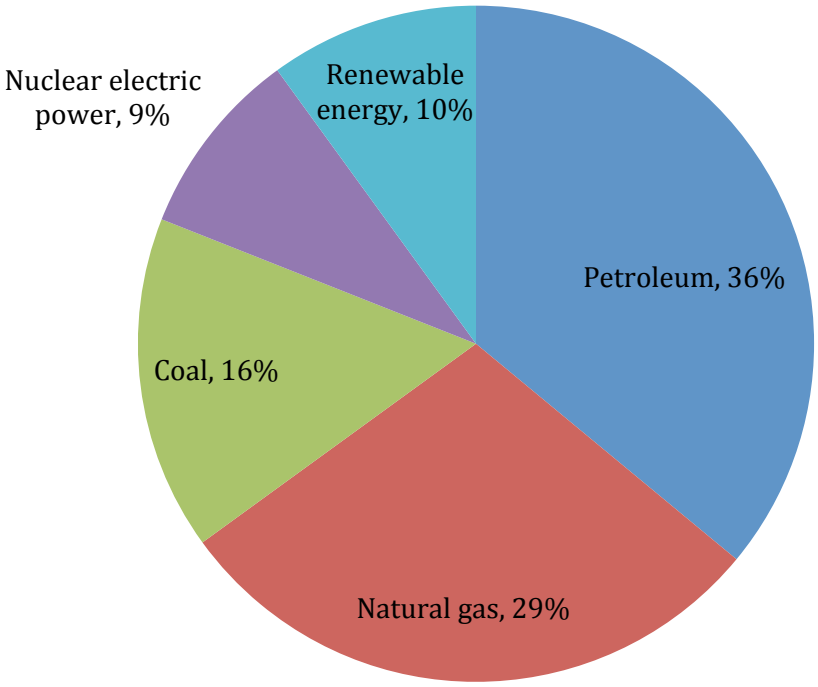

Figure 4.4: U.S. primary energy consumption by source (all sectors), 2015, showing that about 80 % of our energy consumption comes from fossil fuels. Data from U.S. Energy Information Administration, April 2016.

4.3 Coal

Coal is a combustible black or brownish-black sedimentary rock with a high amount of carbon and hydrocarbons. Coal is classified into four main types, or ranks depending on the types and amounts of carbon present and on the amount of heat energy the coal can produce, including anthracite, bituminous, subbituminous, and lignite (highest to lowest ranked, pictured in Figure 4.5). For us to use the potential energy stored in coal, it first must be mined from the ground. This process in itself uses a great deal of resources and has its own environmental impacts. Coal then typically undergoes processing to make it suitable for use in **coal-fire power plants**. Finally, the processed coal is burned in these power plants, and the kinetic energy released from its combustion is harnessed for electricity generation or other purposes. We will investigate each of these steps individually below.

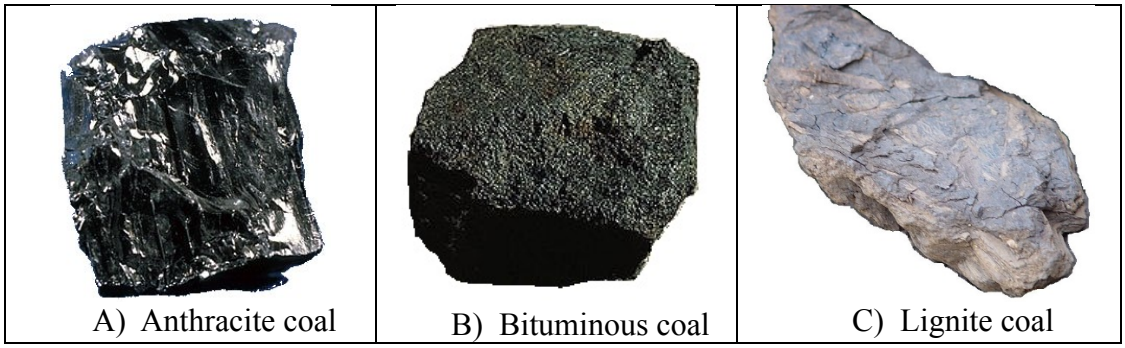

Figure 4.5: Different types of coal. Images obtained from Wikimedia Commons.

4.3.1 Coal Mining and Processing, and Electricity Generation

There are two primary methods of coal mining: **strip mining** and **underground mining**. Strip-, or surface-, mining uses large machines to remove the soil and layers of rock known as **overburden** to expose coal seams. It is typically used when the coal is less than 200 feet underground. **Mountaintop removal** is a form of surface mining where the tops of mountains are blasted with dynamite and removed to access coal seams. After the mining is finished, the disturbed area can be re-covered with topsoil, and the area is replanted. However, the topography of the mountain is permanently altered.

Underground mining, sometimes called deep mining, is used when the coal is several hundred feet below the surface. Some underground mines are thousands of feet deep, and extend for miles. Miners ride elevators down deep mine shafts and travel on small trains in long tunnels to get to the coal. The miners use large machines that dig out the coal.

Once mined, coal may go to a preparation plant located near the mining site where it is cleaned and processed to remove impurities such as rocks and dirt, ash, sulfur, and other unwanted materials. This process increases the amount of energy that can be obtained from a unit of coal, known as its **heating value**.

Finally, the mined and processed coal must be transported. Transportation can be more expensive than mining the coal. Nearly 70% of coal delivered in the United States is transported, for at least part of its trip, by train. Coal can also be transported by barge, ship, or truck. Coal can also be crushed, mixed with water, and sent through a slurry **pipeline**. Sometimes, coal-fired electric power plants are built near coal mines to lower transportation costs.

Once at the power plant, coal is first pulverized into a fine powder then mixed with hot air and blown into a **furnace**, allowing for the most complete combustion and maximum heat possible. Purified water, pumped through pipes inside a **boiler**, is turned into steam by the heat from the combustion of coal. The high pressure of the steam pushing against a series of giant **turbine** blades turns the turbine shaft. The turbine shaft is connected to the shaft of the **generator**, where magnets spin within wire coils to produce electricity. After doing its work in the turbine, the steam is drawn into a **condenser**, a large chamber in the basement of the power plant. In this important step, millions of gallons of cool water from a nearby source (such as a river or lake) are pumped through a network of tubes running through the condenser. The cool water in the tubes converts the steam back into water that can be used over and over again in the plant. The cooling water is returned to its source without any contamination except at a higher temperature than when first extracted from the river or lake. Figure 4.6 below is a schematic diagram showing a typical layout of a coal-fire power plant. You can also watch a short video of a virtual tour of a coal power plant at the URL provided below.

Coal Power Plant Virtual Tour Video

https://www.youtube.com/watch?v=2IKECt4Y3RI

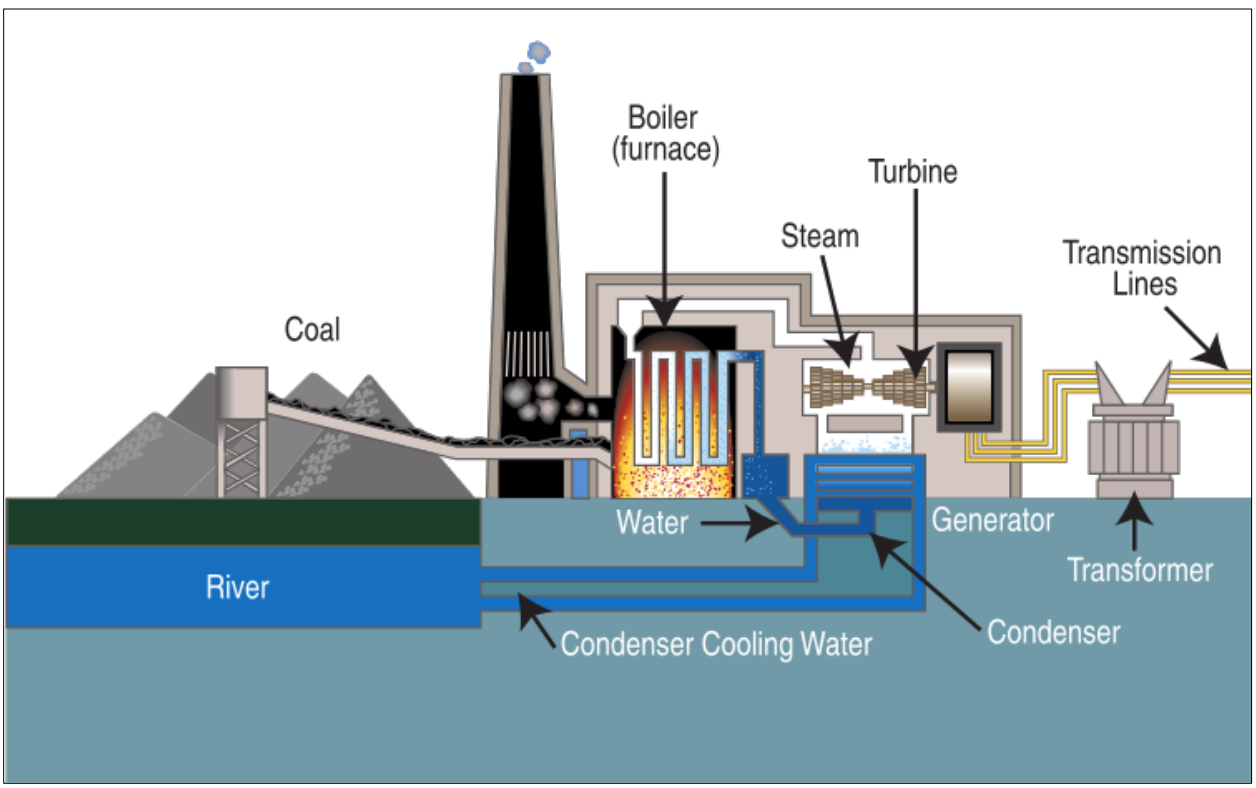

Figure 4.6: Diagram of a typical steam-cycle coal power plant (proceeding from left to right). Image by US Tennessee Valley Authority – Public domain. www.tva.com

4.3.2 Impacts of coal mining and burning

Impacts of coal mining on the environment

A majority of the coal mined in the United States (about 66%) is from surface, or strip mines which leave highly visible impacts at the surface. Strip mining operations generally involve removing soils, rock, and other material to access shallow deposits of coal and therefore leave permanent scars on the landscape. It also involves the destruction of substantial amounts of forests and other ecosystems, destroying natural habitats and threatening biodiversity.

Mountaintop removal, the extreme form of strip mining, has affected large areas of the Appalachian Mountains in West Virginia and Kentucky. The tops of mountains are removed using a combination of explosives and mining equipment and the material is deposited into nearby valleys. This technique not only alters the landscape (Figure 4.7) but affects the health and quality of nearby streams by depositing rocks, dirt, and pollutants that can harm aquatic wildlife. While mountaintop removal mining has existed since the 1970s, its use became more widespread and controversial beginning in the 1990s. U.S. laws require that dust and water runoff from areas affected by coal mining operations be controlled, and that the area be **reclaimed**, and returned to close to its original condition.

Figure 4.7: A) Strip mine for lignite coal at Garzweiler near Koln, Germany. Image from Wikimedia commons https://commons.wikimedia.org/wiki/File:Garzweiler.strip.mine.jpg B) Mountaintop removal in Eunice WV, photo by Roston, obtained from https://commons.wikimedia.org/wiki/File:Euniceblast3.JPG

One of the largest environmental impacts of underground mining may be the **methane** gas that must be vented out of mines to make the mines a safe place to work. Methane is a **greenhouse gas**, meaning that it enhances the greenhouse effect naturally occurring in our atmosphere, and contributes to global warming and global climate change. Its global warming potential, or relative capacity to produce the greenhouse effect, is higher than that of carbon dioxide (see chapter 7). Other impacts of underground mining include ground collapse above

mine tunnels and draining of acidic water from abandoned mines into nearby streams. Acidic water lowers the pH (resulting in increased **acidity**), which is detrimental to aquatic organisms. This **acid mine drainage** is an environmental impact associated with both underground mining and strip mining.

Impacts of coal burning on the environment and human health

In the United States and most of the world, most of the coal consumed is used as a fuel to generate electricity. Burning coal produces emissions such as **sulfur dioxide** (SO_2) and **nitrogen oxides** (NO_x) that are associated with acid rain (more on this in chapter 6). **Carbon dioxide** (CO_2), another emission resulting from burning coal, is a major greenhouse gas that is associated with global warming (see chapter 7).

Ash (including fly ash and bottom ash) is a residue created when coal is burned at power plants. In the past, fly ash was released into the air through the smokestack, where it would contribute to **particulate matter** air pollution (see chapter 6). Laws now require that much of the fly ash now must be be captured by pollution control devices, like scrubbers. In the United States, fly ash is generally stored at coal power plants or placed in landfills. Pollution leaching from ash storage and landfills into groundwater and the rupture of several large impoundments of ash are environmental concerns.

Burning coal produces emissions that also impact human health. Emissions such as sulfur dioxide (SO_2), nitrogen oxides (NO_x) and particulates contribute to respiratory illnesses. Particulates also contribute to a condition among coal miners and other coal workers known as coal workers' pneumoconiosis (CWP) or black lung disease, which results from long exposure to coal dust. Inhaled coal dust progressively builds up in the lungs and is unable to be removed by the body; this leads to inflammation, fibrosis, and in worse cases, tissue death (necrosis).

Coal is the largest source of **mercury** and also a source of other **heavy metals**, many of which have been linked to both neurological and developmental problems in humans and other animals. Mercury concentrations in the air usually are low and of little direct concern. However, when mercury enters water, either directly or through deposition from the air, biological processes transform it into **methylmercury**, a highly toxic chemical that accumulates in fish and the animals (including humans) that eat fish.

4.3.3 Reducing the environmental impacts of coal use

Regulations such as the **Clean Air Act** and the **Clean Water Act** require industries to reduce pollutants released into the air and water. Below are some actions that have been taken to reduce the negative impacts of coal on human and environmental health:

- **Clean coal technology**: Industry has found several ways to reduce sulfur, NO_x, and other impurities from coal before burning.
- Coal consumers have shifted toward greater use of low sulfur coal.
- Power plants use **scrubbers**, to clean SO_2, NO_x, particulate matter, and mercury from the smoke before it leaves their smokestacks. In addition, industry and the U.S. government have cooperated to develop technologies that make coal more energy-efficient so less needs to be burned.
- Research is underway to address emissions of carbon dioxide from coal combustion. **Carbon capture & sequestration** separates CO_2 from emissions sources and recovers it in a

concentrated stream. The CO_2 can then be sequestered, which puts CO_2 into storage, possibly underground, where it will remain permanently (see chapter 7).

- Reuse and recycling can also reduce coal's environmental impact. Land that was previously used for coal mining can be reclaimed and used for airports, landfills, and golf courses. Waste products captured by scrubbers can be used to produce products like cement and synthetic gypsum for wallboard.

4.4 Oil

Petroleum Oil is currently the most widely used fossil fuel and accounts for about one third of global energy consumption. Unlike coal, which is primarily used as a fuel for electricity generation, oil is primarily used as a fuel for **transportation**. Oil is also used to manufacture **plastics** and other synthetic compounds ubiquitous to our everyday life. **Crude** (unprocessed) oil varies greatly in appearance depending on its composition. It is usually black or dark brown (although it may be yellowish, reddish, or even greenish). In the reservoir it is usually found in association with natural gas, which being lighter forms a gas cap over the oil.

Oil is made up of hydrocarbons which are molecules that contain hydrogen and carbon in various lengths and structures, from straight chains to branching chains to rings. Hydrocarbons contain a lot of energy and many of the things derived from crude oil like gasoline, diesel fuel, paraffin wax and so on take advantage of this energy.

4.4.1 Extraction

Oil is mainly obtained by drilling either on land (**onshore**) or in the ocean (**offshore**). Early offshore drilling was generally limited to areas where the water was less than 300 feet deep. Oil and natural gas drilling rigs now operate in water as deep as two miles. Floating platforms are used for drilling in deeper waters. These self-propelled vessels are attached to the ocean floor using large cables and anchors. Wells are drilled from these platforms which are also used to lower production equipment to the ocean floor. Some drilling platforms stand on stilt-like legs that are embedded in the ocean floor. These platforms hold all required drilling equipment as well as housing and storage areas for the work crews.

Offshore oil producers are required to take precautions to prevent pollution, spills, and significant changes to the ocean environment. Offshore rigs are designed to withstand hurricanes. Offshore production is much more expensive than land-based production. When offshore oil wells are no longer productive enough to be economical, they are sealed and abandoned according to applicable regulations.

4.4.2 Processing and Refining

When extracted, crude oil consists of many types of hydrocarbons as well as some unwanted substances such as sulfur, nitrogen, oxygen, dissolved metals, and water all mixed together. Unprocessed crude oil is therefore, not generally useful in industrial applications and must first be separated into different useable products at a **refinery** (Figure 4.8). All refineries perform three basic steps: separation, conversion, and treatment in the processing and refining of crude oil.

Figure 4.8: Tesoro Corporation Oil Refinery in Anacortes, Washington. Photo by Walter Siegmund. https://commons.wikimedia.org/wiki/Oil_refinery#/media/File:Anacortes_Refinery_31904.JPG

During **separation**, the various products (hydrocarbons) are separated in to different components (called *fractions*), by taking advantage of the differences in boiling temperature of the components. This process is called *fractional distillation* and involves heating up the crude, letting it vaporize and then condensing the vapor. The lightest components have the lowest boiling temperature and rise to the top while the heaviest which also have the highest boiling temperature remain at the bottom.

Conversion is the chemical processing in which some of the fractions are transformed in to other products, for example, a refinery can turn diesel fuel into gasoline depending on the demand for gasoline. Conversion can involve breaking larger hydrocarbon chains into smaller ones (cracking), combining smaller chains into larger ones (unification) or rearranging the molecules to created desired products (alteration).

Treatment is done to the fractions to remove impurities such as sulfur, nitrogen and water among others. Refineries also combine the various fractions (processed and unprocessed) into mixtures to make desired products. For example, different mixtures of hydrocarbon chains can create gasolines with different octane ratings, with and without additives, lubricating oils of various weights and grades (e.g., WD-40, 10W-40, 5W-30, etc.), heating oil and many others. The products are stored on-site until they can be delivered to various markets such as gas stations, airports and chemical plants.

A 42 U.S. gallon barrel of crude oil yields about 45 gallons of petroleum products because of refinery processing gain. This increase in volume is similar to what happens to popcorn when it is popped. Gasoline makes up the largest fraction of all petroleum products obtained (Figure 4.9). Other products include diesel fuel and heating oil, jet fuel, petrochemical feedstocks, waxes, lubricating oils, and asphalt.

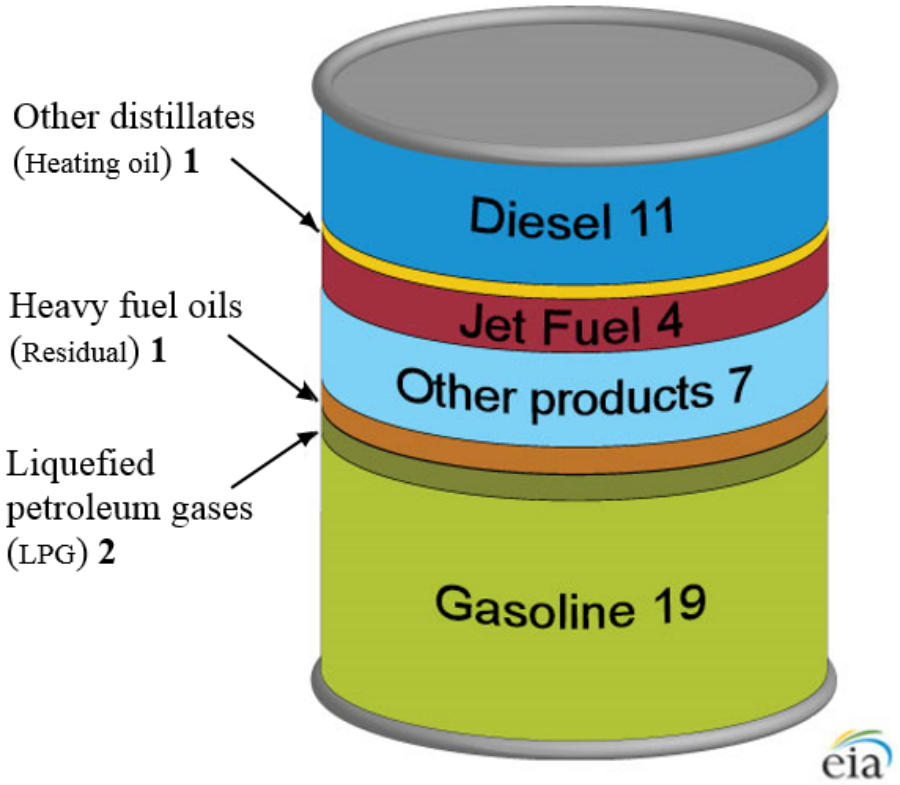

Figure 4.9:Main products (measured in gallons) made from a barrel of crude oil, 2013. ***Source***: U.S. Energy information administration http://www.eia.gov/energyexplained/index.cfm?page=oil_home

4.4.3 Fracking for oil

Hydraulic fracturing, informally referred to as "fracking," is an oil well development process that typically involves injecting water, sand, and chemicals under high pressure into a bedrock formation via the well. This process is intended to create new fractures in the rock as well as increase the size, extent, and connectivity of existing fractures. Hydraulic fracturing is a well-stimulation technique used commonly in low-permeability rocks like tight sandstone, shale, and some coal beds to increase oil flow to a well from petroleum-bearing rock formations (Figure 4.10).

Energy development often requires substantial amounts of water, and hydraulic fracturing is no exception. Water is needed not only for the traditional drilling process, but also for the actual fracturing as well. Water is first mixed with chemicals and fine sands, then pumped at extremely high pressure into the shale rock to fracture it, forming pathways for the oil and gas to reach the well. The water is then recovered, along with the oil and gas.

There are concerns regarding the potential contamination of fresh groundwater resources from oil and gas extraction wells that use hydraulic fracturing; either from the petroleum resource being produced or from the chemicals introduced in the fracturing process. Fracking fluid flowback – the fluid pumped out of the well and separated from oil and gas – not only contains the chemical additives used in the drilling process but also contains heavy metals, radioactive materials, **volatile organic compounds** (VOCs) and hazardous air pollutants such as

benzene, toluene, ethylbenzene and xylene. In some cases, this contaminated water is sent to water treatment plants that are not equipped to deal with some of these classes of contamination.

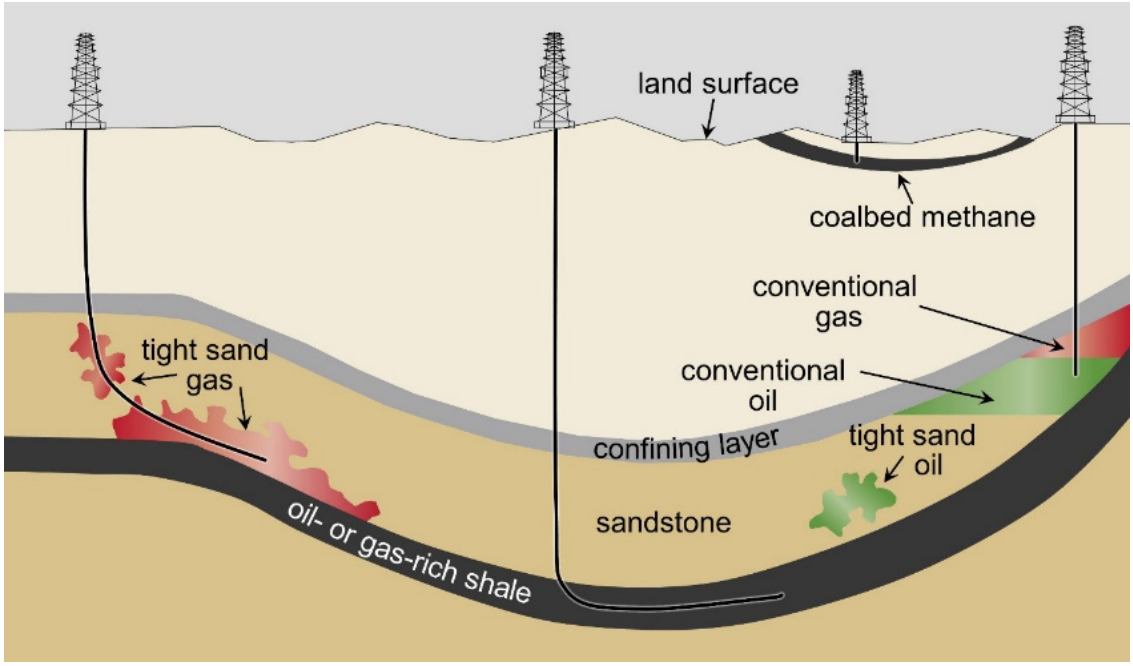

Figure 4.10: Schematic cross-section of general types of oil and gas resources and the orientations of production wells used in hydraulic fracturing. Source: US EPA (Public Domain)

4.4.4 Environmental Impacts of Oil

Burning petroleum oil products releases emission such as **carbon monoxide** (CO), sulfur dioxide (SO_2), nitrogen oxides (NO_x), and particulate material all of which are air pollutants that impact the environment as well as human health (see more on air pollution in Chapter 6). Petroleum also emits carbon dioxide which is a greenhouse gas.

Exploring and drilling for oil may disturb land and ocean habitats. On land, extensive infrastructure such as road networks, transport pipelines and housing for workers are needed to support a full-scale drilling operation. These can pollute soil and water, fragment habitats, and disturb wildlife.

Human-caused **oil spills** in rivers and oceans harm ecosystems. Natural oil seepages do occur and may be a significant source of oil that enters the environment globally, but they are slow, small, and spread out over large areas, and the ecosystem has adapted to them. Spills from tankers or well spills have more catastrophic impacts. The quantity of oil spilled during accidents has ranged from a few hundred tons to several hundred thousand tons but even small spills have been shown to have a great impact on ecosystems.

Oil spills at sea are generally much more damaging than those on land, since they can spread for hundreds of nautical miles in a thin oil slick which can cover beaches with a thin coating of oil. This can kill sea birds, mammals, shellfish and other organisms it coats. Oil spills on land are more readily containable if a makeshift earth dam can be rapidly bulldozed around the spill site before most of the oil escapes, and land animals can avoid the oil more easily. The

amount of oil spilled from ships dropped significantly during the 1990s partly because new ships were required to have a double-hull lining to protect against spills.

Leaks also happen when we use petroleum products on land. For example, gasoline sometimes drips onto the ground when people are filling their gas tanks, when motor oil gets thrown away after an oil change, or when fuel escapes from a leaky storage tank. When it rains, the spilled products get washed into the gutter and eventually flow to rivers and into the ocean. Another way that oil sometimes gets into water is when fuel is leaked from motorboats and jet skis.

When a leak in a storage tank or pipeline occurs, petroleum products can also get into the ground, and the ground must be cleaned up. To prevent leaks from underground storage tanks, all buried tanks are supposed to be replaced by tanks with a double lining.

4.5 Natural Gas

Crude oil is frequently found in reservoirs along with natural gas. In the past, natural gas was either burned or allowed to escape into the atmosphere. Now, technology has been developed to capture the natural gas and either reinject it into the well or compress it into **liquid natural gas** (LNG).

Natural gas is predominately composed of methane (CH_4). Some of the gases that are produced along with methane, such as butane and propane (by-products), are separated and cleaned at a gas processing plant. The by-products, once removed, are used in a number of ways. For example, propane can be used for cooking on gas grills. Natural gas withdrawn from a well may contain liquid hydrocarbons and nonhydrocarbon gases. This is called "wet" natural gas. The natural gas is separated from these components near the site of the well or at a processing plant. The gas is then considered "dry" and is sent through pipelines to a local distribution company, and, ultimately, to the consumer.

Most of the natural gas consumed in the United States is produced in the United States. Some is imported from Canada and shipped to the United States in pipelines. A small amount of natural gas is shipped to the United States as LNG. We can also use machines called **digesters** that turn today's organic material (plants, animal wastes, etc.) into natural gas through the process of anaerobic decomposition. This process replaces waiting for millions of years for the gas to form naturally. The natural gas produced by these digesters is not a fossil fuel, but is rather a renewable source of bioenergy (see chapter 5).

4.5.2 Fracking for Gas

Conventional natural gas is found in permeable reservoirs, typically composed of sandstone or limestone, where extraction is relatively straightforward because the gas generally flows freely. Unconventional gas is found in rocks with extremely low permeability, which makes extracting it much more difficult. Such gas is extracted by employing so called “unconventional” techniques such as hydraulic fracturing (fracking), which has been in use since the late 1940s. In recent decades, fracking technology has greatly improved, and its use has been expanded. The process of fracking for gas is very similar to that of fracking for oil, and the environmental impacts are similar also.

4.6 Fossil Fuels and Greenhouse Gases

Fossil fuels are made up mainly of hydrogen and carbon. When burned, the carbon combines with oxygen to create carbon dioxide (CO_2). The amount of CO_2 produced depends on the carbon content of the fuel. For example, for the same amount of energy produced, natural gas produces about half and petroleum produces about three-fourths of the amount of CO_2 produced by coal. Energy-related CO_2 emissions, resulting from the combustion of coal, petroleum, and natural gas, account for about 80% of total U.S. human-caused (anthropogenic) greenhouse gas (GHG) emissions. There are many sources of non-energy CO_2 emissions, but those emissions account for a relatively small share of total GHG emissions. See chapter 7 for a discussion of the results of GHG emissions.

Energy use is largely driven by economic growth and by weather patterns that affect heating and cooling needs. The fuels used in electricity generation also have an impact on the amount of GHG emissions. In the United States, most of the electricity generated comes from coal power plants and consequently, majority of the carbon dioxide emission resulting from electricity generation is from coal combustion (Figure 4.11). Although the industrial sector is the largest consumer of energy (including direct fuel use and purchased electricity), the transportation sector emits more carbon dioxide because of its near complete dependence on petroleum fuels. The residential and commercial sectors have lower emission levels (most of which comes from fossil energy combustion to produce electricity) than the transportation and industry sectors.

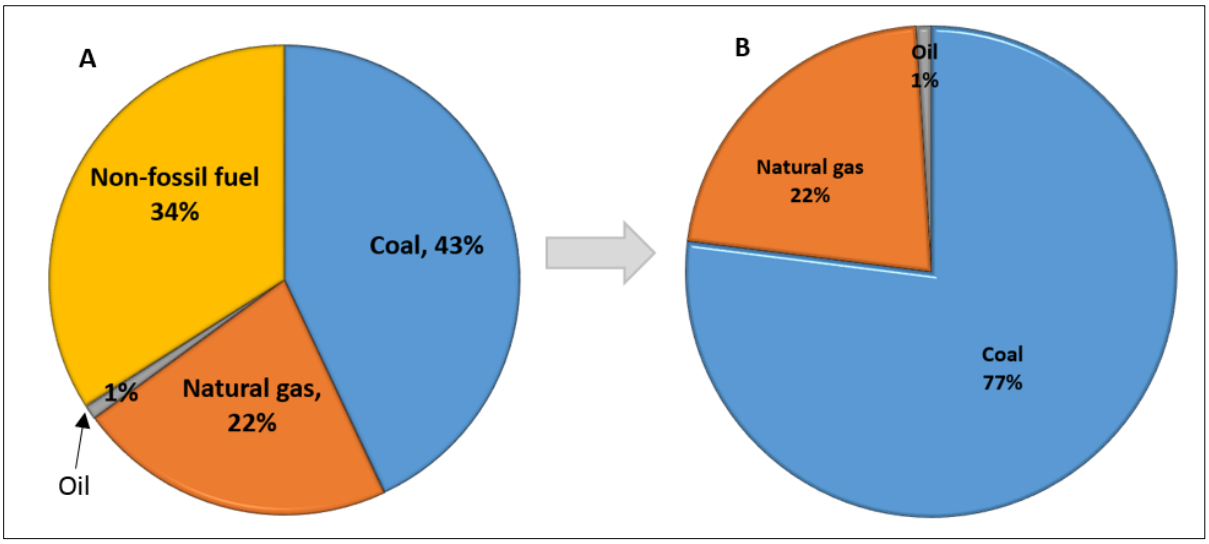

Figure 4.11: A) Major fuel/energy sources for U.S. electricity generation, 2013. B) Resulting carbon dioxide emissions from electricity generation by fuel type, 2013. Based on data from U.S. Energy Information Administration

4.7 Nuclear Energy

Nuclear energy is energy in the **nucleus** (core) of an atom (see chapter 1 for a review of atomic structure). There is enormous energy in the forces that hold protons and neutrons in the

nucleus together. Energy is released when those forces are broken. Nuclear energy can be released from atoms by splitting apart the nucleus of an atom to form smaller atoms, a process known as **nuclear fission**. During nuclear fission, a small atomic particle called a **neutron** hits the uranium atom and splits it, releasing a great amount of energy in the form of heat and **radiation**. More neutrons are also released when the uranium atom splits. These neutrons go on to bombard other uranium atoms, and the process repeats itself over and over again. This is called a **chain reaction** (Figure 4.12). Nuclear power plants use the energy from nuclear fission to produce electricity.

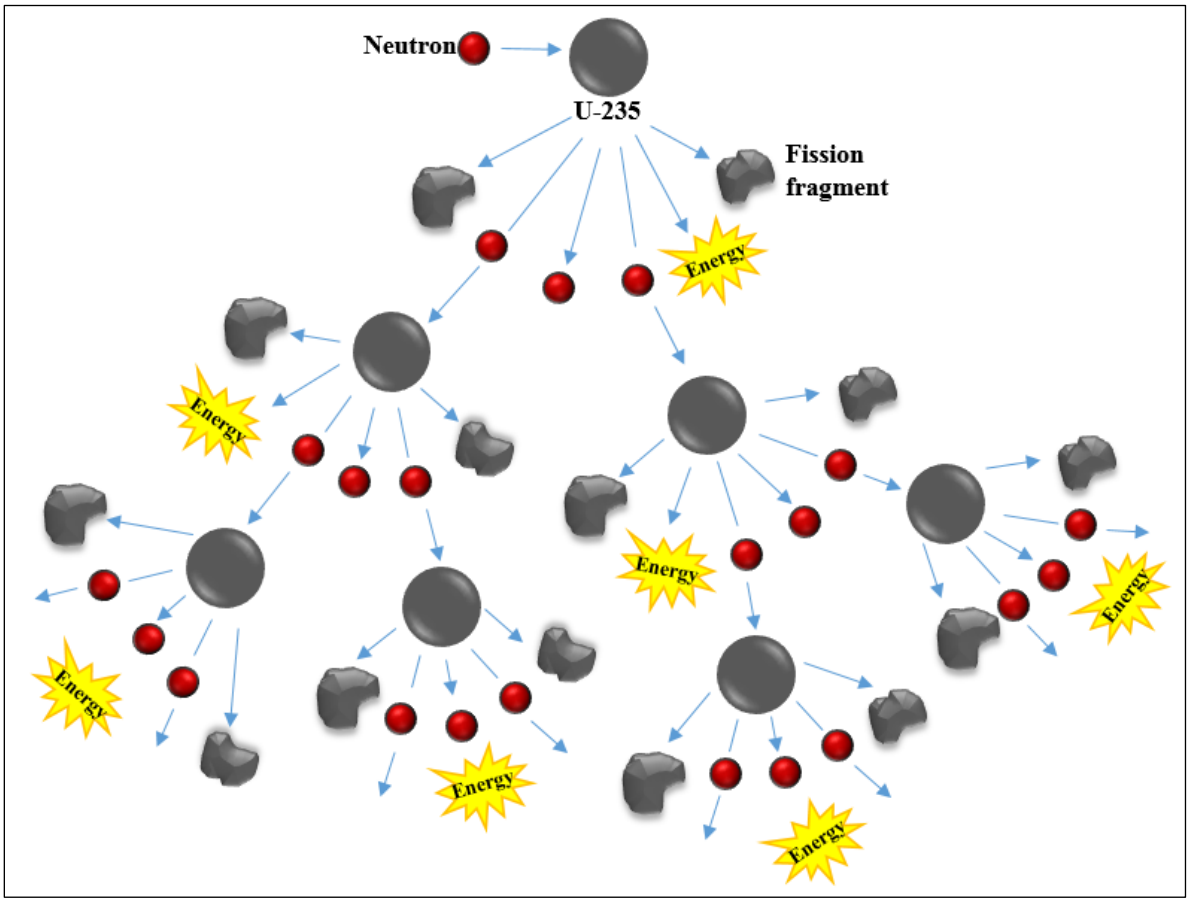

Figure 4.12: Fission chain reaction – begins when a neutron bombards a U-235 atom, splitting it into two fission fragments, along with more neutrons and energy. The neutrons bombard other uranium atoms releasing more energy and more neutrons and the reaction continues.

4.7.1 Nuclear fuel processing

Uranium is a naturally occurring radioactive element that decays into daughter **isotopes** (see chapter 1 for a review of isotopes), releasing radiation energy in the process. There are three naturally occurring isotopes of uranium almost all (99.27 %) of which is uranium-238 (U-238); the remainder consists of U-235 (0.72 %) and U-234 (0.006 %). **U-235** is the preferred nuclear fuel because when its atoms are split (fissioned), they not only emit heat and high energy radiation but also enough neutrons to maintain a chain reaction and provide energy to power a

nuclear power plant. Uranium is found in rocks all over the world but is relatively rare and the supply is finite making it a nonrenewable energy source.

Uranium usually occurs in combination with small amounts of other elements and once it is mined, the U-235 must be extracted and processed before it can be used as a fuel in a nuclear power plant to generate electricity. The process begins with **exploration** for uranium and the development of mines to extract the discovered **ore** (*ore* refers to rock that contains minerals of economic importance). Mining is either conventional (underground or open pit) or unconventional, such as in-place solution mining or heap leaching, which use liquid solvents to dissolve and extract the ore. Mined uranium ore (Figure 4.13 A) typically yields one to four pounds of uranium concentrate per ton of uranium ore (0.05% to 0.20%).

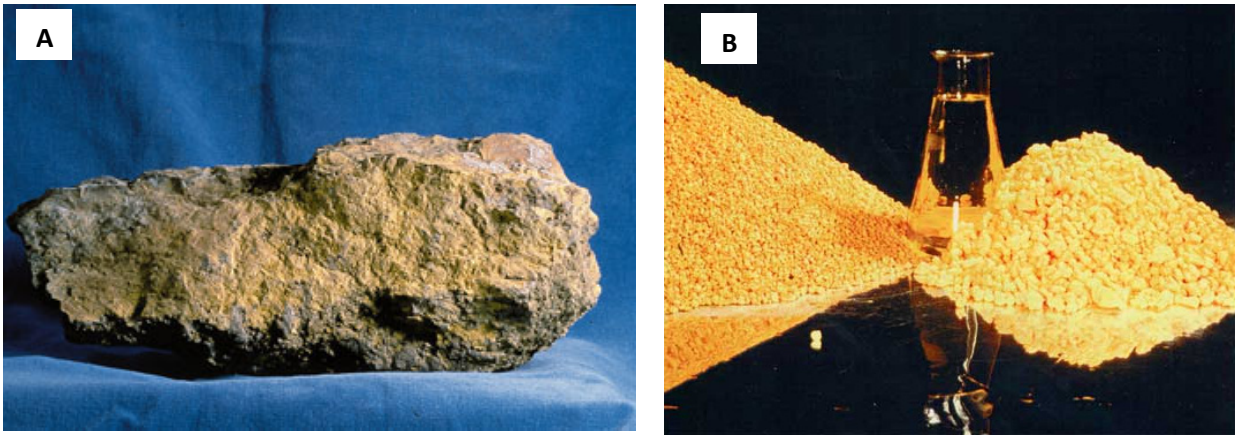

Figure 4.13: A) Uranium ore B) Yellowcake (U_3O_8). Images obtained from United States Geological Survey (A) and United States Department of Energy (B).

Uranium ore from a conventional mine is usually refined into uranium concentrate in a process referred to as **milling**. The ore is crushed and ground into fine powder that is then reacted with chemicals to separate the uranium from other minerals. The concentrated uranium product is typically a bright yellow or orange powder called *yellowcake* (U_3O_8) (Figure 4.13 B), and the waste stream from these operations is called *mill tailings.* Uranium ore in solution is also milled into yellowcake by retrieving the uranium out of the solution and concentrating it.

The yellowcake then undergoes **conversion** into uranium hexafluoride (UF_6) gas. This step enables the atomic segregation of the three naturally occurring uranium isotopes in to individual components. In the UF_6 gas, the original concentrations of uranium isotopes are still unchanged. This gas is then sent to an **enrichment** plant where the isotope separation takes place and the concentration of U-235 is increased to about a 4% to 5% (compared to 0.72 % original concentration). The product, called *enriched UF_6,* is sealed in canisters and allowed to cool and solidify before it is transported to a fuel assembly plant.

The next step in the production of nuclear fuel takes place at fuel **fabrication** facilities. Here, the enriched UF_6 gas is reacted to form a black uranium dioxide (UO_2) powder. The powder is then compressed and formed into the shape of small ceramic *fuel pellets* (Figure 4.14 A). Each ceramic pellet produces roughly the same amount of energy as 150 gallons of oil. The pellets are stacked and sealed into long metal tubes that are about 1 centimeter in diameter to form **fuel rods**. (Figure 4.14 B) fuel rods are then bundled together to make up a *fuel assembly*

(Figure 4.14 C). Depending on the reactor type, there are about 179 to 264 fuel rods in each fuel assembly. A typical reactor core holds 121 to 193 fuel assemblies.

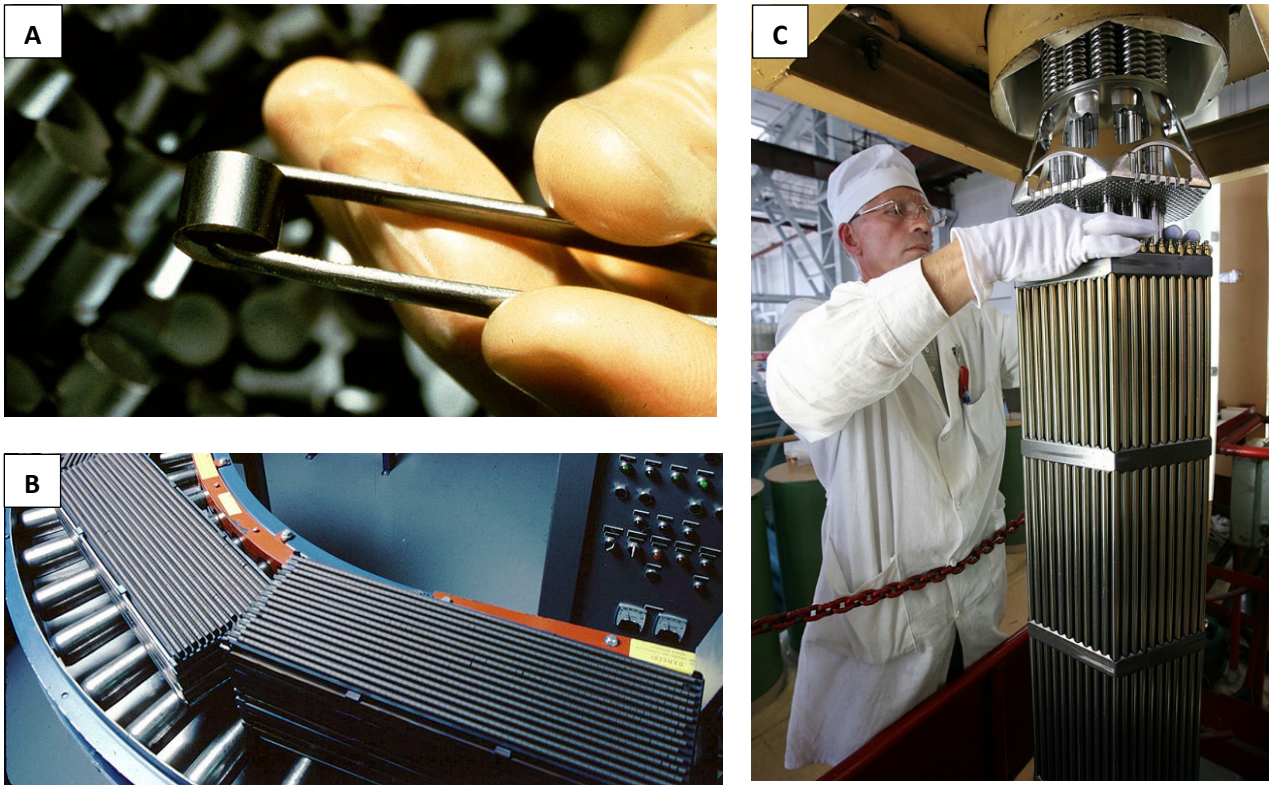

Figure 4.14: Fuel fabrication process. A) Uranium dioxide powder compressed into *fuel pellets*. B) Fuel pellets stacked and sealed in metal tubes forming *fuel rods*. C) Fuel rods are bundled into a *fuel assembly*. Images A and B from NRC (public domain); C from RIA Novosti archive, image #132602 / Ruslan Krivobok / CC-BY-SA 3.0

4.7.2 Nuclear Power Plant

After fabrication, fuel assemblies are transported to nuclear power plants where they are used as a source of energy for generating electricity. They are stored onsite until they are needed by the reactor operators. At this stage, the uranium is only mildly radioactive, and essentially all radiation is contained within the metal tubes. When needed, the fuel is loaded into a reactor core (Figure 4.15). Typically, about one third of the reactor core (40 to 90 fuel assemblies) is changed out every 12 to 24 months.

The most common type of reactors are the **pressurized water reactors** (PWR) (Figure 4.15) in which water is pumped through the *reactor core* and heated by the fission process. The water is kept under high pressure inside the reactor so it does not boil. The heated water from the reactor passes through tubes inside the *steam generator* where the heat is transferred to water flowing around the tubes in the steam generator. The water in the steam generator boils and turns to steam. The steam is piped to the turbines. The force of the expanding steam drives the turbines, which spin a magnet in coil of wire – the generator– to produce electricity.

After passing through the turbines, the steam is converted back to water by circulating it around tubes carrying cooling water in the *condenser*. The condensed steam – now water – is returned to the steam generators to repeat the cycle.

The three water systems (condenser, steam generator, and reactor) are separate from each other and are not permitted to mix. Water in the reactor is radioactive and is contained within the containment structure whereas water in the steam generator and condenser is nonradioactive.

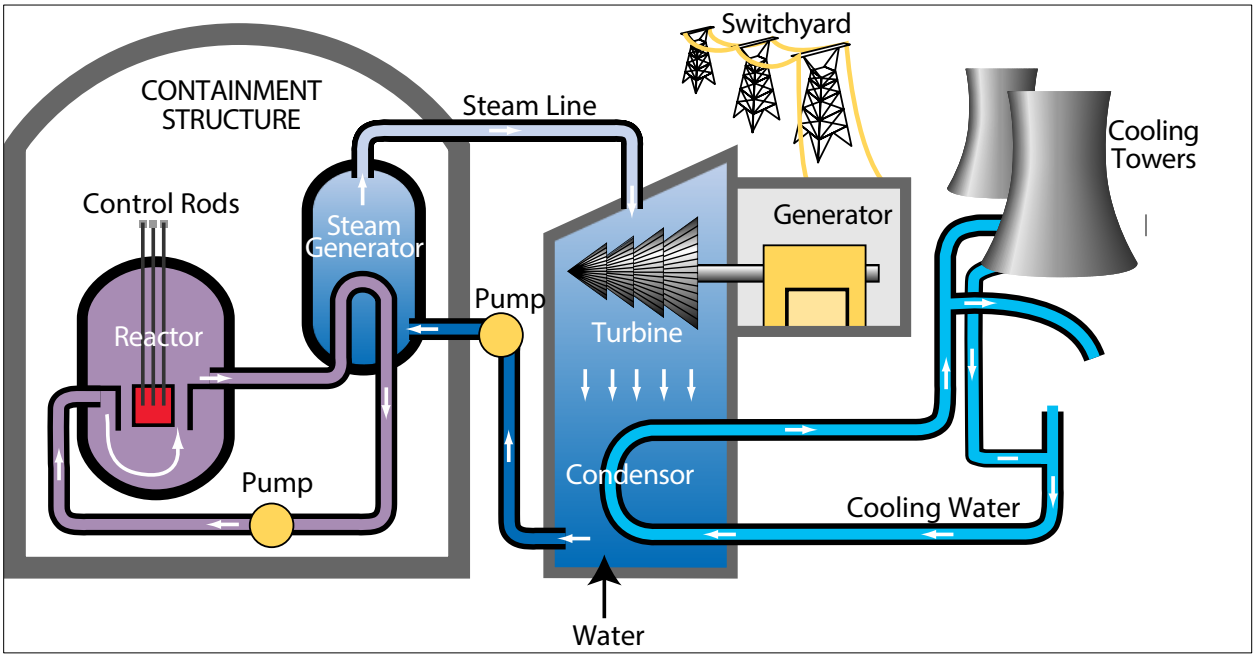

Figure 4.15: A schematic diagram of a pressurized water reactor (PWR), the most common type of nuclear reactor. Diagram from Tennessee Valley Authority (public domain). www.tva.com

4.7.3 Benefits of Nuclear Energy

By using fission, nuclear power plants generate electricity without emitting air pollutants like those emitted by fossil fuel-fired power plants. This means that financial costs related to chronic health problems caused by air pollutants such as particulate material, carbon monoxide, nitrogen oxides and ozone among others are significantly reduced. In addition nuclear reactors do not produce carbon dioxide while operating which means that nuclear energy does not contribute to the global warming problem.

Another benefit of nuclear energy over fossil fuels especially coal is that uranium generates far more power per unit weight or volume. This means that less of it needs to be mined and consequently the damage to the landscapes is less especially when compared to the damage that results from coal mining such as mountaintop removal.

4.7.4 The Drawbacks of Nuclear Energy

The main environmental concern related to nuclear power is the creation of radioactive wastes such as uranium mill tailings, spent (used) reactor fuel, and other radioactive wastes. These materials can remain radioactive and dangerous to human health for thousands of years. Radioactive wastes are classified as low-level and high-level. By volume, most of the waste

related to the nuclear power industry has a relatively low-level of radioactivity. Uranium mill tailings contain the radioactive element radium, which decays to produce **radon**, a radioactive gas. Most uranium mill tailings are placed near the processing facility or mill where they come from. Uranium mill tailings are covered with a barrier of material such as clay to prevent radon from escaping into the atmosphere, and they are then covered by a layer of soil, rocks, or other materials to prevent erosion of the sealing barrier.

The other types of low-level radioactive waste are the tools, protective clothing, wiping cloths, and other disposable items that get contaminated with small amounts of radioactive dust or particles at nuclear fuel processing facilities and power plants. These materials are subject to special regulations that govern their handling, storage, and disposal so they will not come in contact with the outside environment.

High-level radioactive waste consists of spent nuclear reactor fuel (i.e., fuel that is no longer useful for producing electricity). The spent reactor fuel is in a solid form consisting of small fuel pellets in long metal tubes called rods. Spent reactor fuel assemblies are initially stored in specially designed pools of water, where the water cools the fuel and acts as a radiation shield. Spent reactor fuel assemblies can also be stored in specially designed dry storage containers. An increasing number of reactor operators now store their older spent fuel in dry storage facilities using special outdoor concrete or steel containers with air cooling. There is currently no permanent disposal facility in the United States for high-level nuclear waste.

When a nuclear reactor stops operating, it must be **decommissioned**. This involves safely removing the reactor and all equipment that has become radioactive from service and reducing radioactivity to a level that permits other uses of the property. The U.S. Nuclear Regulatory Commission has strict rules governing nuclear power plant decommissioning that involve cleanup of radioactively contaminated plant systems and structures, and removal of the radioactive fuel.

A **nuclear meltdown**, or uncontrolled nuclear reaction in a nuclear reactor, can potentially result in widespread contamination of air and water. Some serious nuclear and radiation accidents have occurred worldwide. The most severe accident was the Chernobyl accident of 1986 in the then Soviet Union (now Ukraine) which killed 31 people directly and sickened or caused cancer in thousands more. The Fukushima Daiichi nuclear disaster (2011) in Japan was caused by a 9.0 magnitude earthquake that shut down power supply and a tsunami that flooded the plant's emergency power supply. This resulted in the release of radioactivity although it did not directly result in any deaths at the time of the disaster. Another nuclear accident was the Three Mile Island accident (1979) in Pennsylvania, USA. This accident resulted in a near disastrous core meltdown that was due to a combination of human error and mechanical failure but did not result in any deaths and no cancers or otherwise have been found in follow up studies of this accident. While there are potentially devastating consequences to a nuclear meltdown, the likelihood of one occurring is extremely small. After every meltdown, including the 2011 Fukushima Daiichi disaster, new international regulations were put in place to prevent such an event from occurring again.

The processes for mining and refining uranium ore and making reactor fuel require large amounts of energy. Nuclear power plants have large amounts of metal and concrete, which also require large amounts of energy to manufacture. If fossil fuels are used for mining and refining uranium ore or in constructing the nuclear plant, then the emissions from burning those fuels could be associated with the electricity that nuclear power plants generate.

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Nuclear Regulatory Commission www.nrc.gov

Tennessee Valley Authority www.tva.com

U.S. Department of Energy http://www.energy.gov/

U.S Energy Information Administration http://www.eia.gov/

U.S. Environmental Protection Agency www.epa.gov

Terms list

Acid mine drainage
Anaerobic
Ash
Boiler
Caprocks
Carbon capture & sequestration
Carbon dioxide
Carbon monoxide
Chain reaction
Chemical energy
Clean Air Act
Clean coal technology
Clean Water Act
Coal
Coal-fire power plant
Condenser
Conversion
Crude
Decommissioned
Digesters
Electricity
Energy
Enrichment
Exploration
Fabrication
Fossil fuel
Fuel rods
Furnace
Generator
Greenhouse gas
Heating value
Heavy metals
Hydraulic fracturing
Hydrocarbon
Isotope
Kinetic energy
Liquid natural gas
Mercury
Methane
Methylmercury
Milling
Mountaintop removal
Natural gas
Neutron
Nitrogen oxides
Non-renewable
Nuclear fission
Nuclear meltdown
Nucleus
Offshore
Oil
Oil spill
Onshore
Ore
Overburden
Particulate matter
Petroleum
Pipeline
Plastic
Potential energy
Pressurized water reactors
Primary energy
Radiation
Radon
Reclaimed
Refinery
Scrubber
Secondary energy

Separation
Strip mining
Sulfur dioxide
Transporation
Treatment
Turbine
U-235
Underground mining
Uranium
Volatile organic
compounds

Chapter 5: Alternative energy

Learning outcomes - by the end of this chapter, students should be able to.

1. Describe arguments for alternative energy
2. Explain the following aspects of solar energy:
    a. How passive solar energy works and provide examples of its use.
    b. How solar panels (photovoltaic cells) work.
    c. The limitations and environmental costs associated with solar energy.
3. Explain the following aspects of biofuels / biomass energy:
    a. Describe what is meant by the term "carbon neutral" and explain how biomass energy can and cannot be carbon neutral.
    b. Describe current achievements in biofuels and potential of this area for growth.
4. Describe wind energy and explain the advantages and disadvantages.
5. Describe geothermal energy and explain the advantages and disadvantages
6. Describe hydroelectric energy, advantages and disadvantages

Chapter Outline

5.1 INTRODUCTION 2
5.1.1 The World's Growing Energy Needs 3
5.1.2 Why Use Renewable Energy Sources? 4
5.2 SOLAR ENERGY 4
5.2.1 Passive and Active Solar Energy 5
5.2.3 Environmental Impacts of solar energy 7
5.3 BIOMASS ENERGY 7
5.3.1 Direct combustion of solid biomass 8
5.3.2 Gaseous Biomass 9
5.3.3 Liquid Biofuels 9
5.3.4 Environmental Impacts of Biomass Energy 10
5.4 WIND POWER 11
5.4.1 Environmental Impacts of Wind Energy 12
5.5 GEOTHERMAL ENERGY 12
5.5.1 Environmental Impacts of Geothermal Energy 13
5.6 HYDROELECTRIC POWER (HYDROPOWER) 14
5.6.1 Environmental Impacts of Hydroelectric Power 15
5.6.2 Potential of Tidal Power 16
5.7 OTHER ALTERNATIVE RENEWABLE ENERGY SOURCES 16
5.7.1 Hydrogen 16
5.7.2 Electric cars 18
5.8 POLICY AND CONSERVATION 18

5.1 INTRODUCTION

Energy sources that are more or less continuously made available in a time frame useful to people are called **renewable energy**. Renewable energy sources are often considered alternative sources because, in general, most industrialized countries do not rely on them as their main energy source. Instead, they tend to rely on the conventional energy sources such as fossil fuels or nuclear power that are non-renewable. Because of the energy crisis in the United States during the 1970s, dwindling supplies of fossil fuels and hazards associated with nuclear power, use of renewable energy sources such as solar energy, hydroelectric, wind, biomass, and geothermal has grown. Renewable energy comes from the sun (considered an "unlimited" supply) or other sources that can theoretically be renewed at least as quickly as they are consumed. If used at a sustainable rate, these sources will be available for consumption for thousands of years or longer. Renewable alternatives derive from wind, water, solar or biomass (**Figure 5.1**). Note that wind, water and biomass energy sources are indirect sources of solar energy. One limitation currently associated with most forms of renewable energy is that the energy is not concentrated and not easily portable.

Figure 5.1 A variety of voltage sources (clockwise from top left): the Brazos Wind Farm in Fluvanna, Texas (credit: Leaflet, Wikimedia Commons); the Krasnoyarsk Dam in Russia (credit: Alex Polezhaev); a solar farm (credit: U.S. Department of Energy); and a group of nickel metal hydride batteries (credit: Tiaa Monto). The voltage output of each depends on its construction and load, and equals emf only if there is no load.

Energy is an important ingredient in all phases of society. We live in a very interdependent world, and access to adequate and reliable energy resources is crucial for economic growth and for maintaining the quality of our lives. However, current levels of energy consumption and production are not sustainable because of the heavy reliance on non-renewable energy sources. The principal energy resources used in the world are shown in **Figure 5.2**. The

fuel mix has changed over the years but now is dominated by oil, although natural gas and solar contributions are increasing. About 80 % of our energy comes from nonrenewable fossil fuels and nuclear. The link between global warming and fossil fuel use, with its production of carbon dioxide through combustion, has made, in the eyes of many scientists, a shift to non-fossil fuels of utmost importance – but it will not be easy. About 40 % of the world's energy comes from oil, and much of that goes to transportation uses.

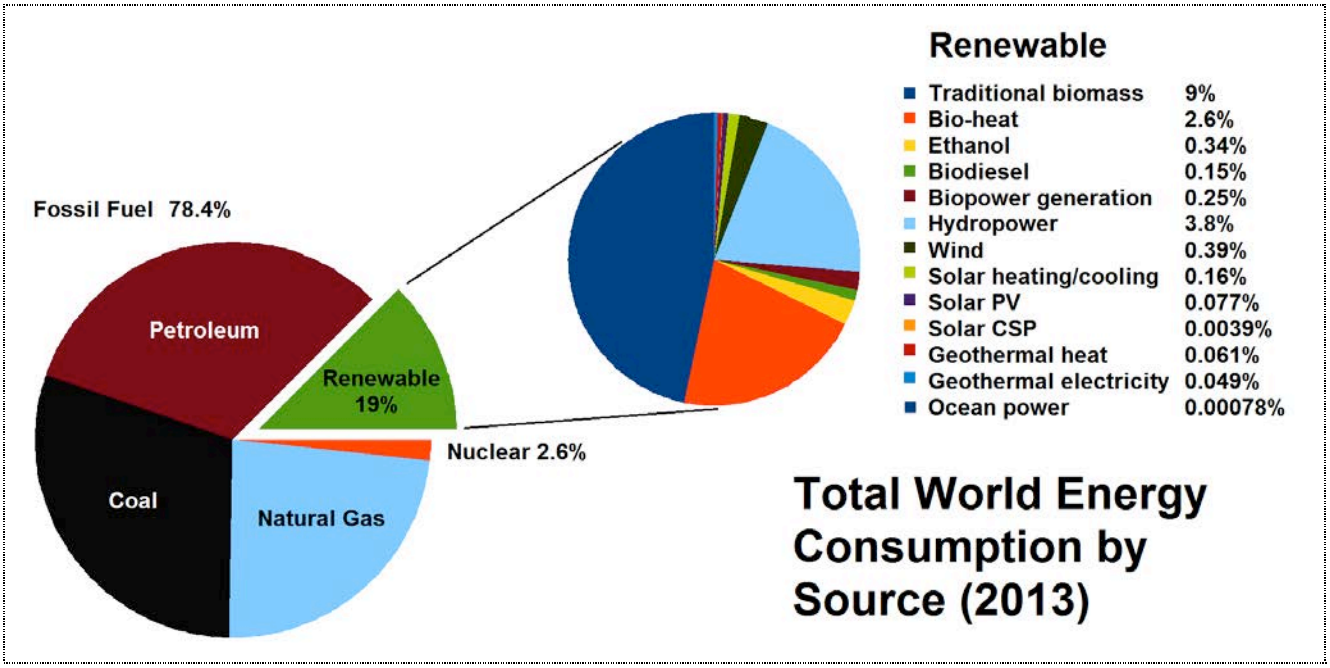


Figure 5.2. World energy consumption by source, 2013, in percent. Notice that when all forms of biomass energy are combined, biomass makes up the largest proportion of renewable energy used worldwide. Source: Wikimedia commons - By Delphi234 - Own work, CC0, https://commons.wikimedia.org/w/index.php?curid=33567170

5.1.1 The World's Growing Energy Needs

World energy consumption continues to rise especially in countries like China where the economy is improving. Global demand for energy has tripled in the past 50 years and might triple again in the next 30 years (**Figure 5.3**). While much of this growth will come from the rapidly booming economies of China and India, many of the industrialized countries, especially those in Europe, are hoping to meet their energy needs by expanding the use of renewable sources. Although presently only a small percentage, renewable energy is growing very fast, especially wind energy. For example, Germany plans to meet 20% of its electricity and 10% of its overall energy needs with renewable resources by the year 2020. Energy is a key constraint in the rapid economic growth of China and India. In 2003, China surpassed Japan as the world's second largest consumer of oil. However, over 1/3 of this oil is imported. Unlike most Western countries, coal dominates the commercial energy resources of China, accounting for 2/3 of its energy consumption. In 2009 China surpassed the United States as the largest emitter of CO_2. In India, the main energy resources are biomass (wood and dung) and coal. Half of India's oil is imported. About 70% of India's electricity is generated by highly polluting coal. Yet there are

sizeable strides being made in renewable energy. India has a rapidly growing wind energy base, and it has the largest solar cooking program in the world. While non-renewable sources dominate, some countries get a sizeable percentage of their electricity from renewable resources. For example, about 67% of New Zealand's electricity demand is met by hydroelectric. Renewable resources, primarily hydroelectric, generate only 10% of the U.S. electricity.

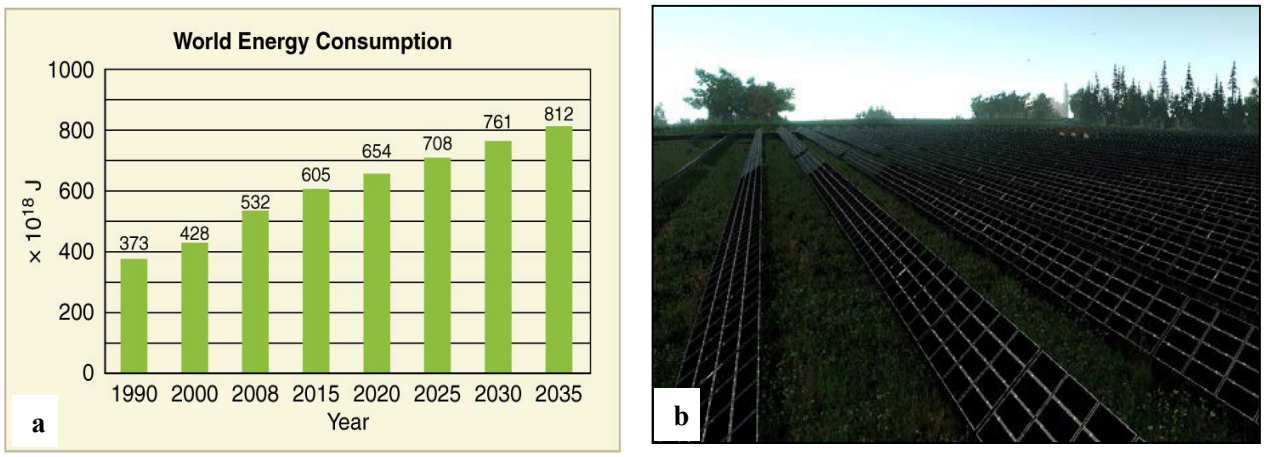


Figure 5.3: (**a**) Past and projected world energy use (source: Based on data from U.S. Energy Information Administration, 2011). (**b**) Solar cell arrays at a power plant in Steindorf, Germany (credit: Michael Betke, Flickr).

5.1.2 Why Use Renewable Energy Sources?

Majority of renewable energy sources including solar, wind, water, and biomass can be directly or indirectly attributed to the sun. The fact that the sun will continue burning for another 4-5 billion years makes it inexhaustible as an energy source for human civilization. With appropriate technology, renewable energy sources allow for local, decentralized control over power. Homes, businesses, and isolated communities can use sources such as solar to produce electricity without being near a power plant or being connected to a grid. This eliminates problems such as spills associated with extraction and transportation of fossil fuels that is needed in order to supply these fossil fuels to those areas that are lacking. Most renewable energy sources do not pollute the air with greenhouse gas emissions and other air pollutants associated with fossil fuels. This is especially important in combating climate change.

5.2 SOLAR ENERGY

Solar energy is the ultimate energy source driving life on earth and many human activities. Though only one billionth of the energy that leaves the sun (**Figure 5.4**) actually reaches the earth's surface, this is more than enough to meet the world's energy requirement. In fact, all other sources of energy, renewable and non-renewable, are actually stored forms of solar energy. The process of directly converting solar energy to heat or electricity is considered a renewable energy source. Solar energy represents an essentially unlimited supply of energy as the sun will long outlast human civilization on earth. The difficulties lie in harnessing the energy. Solar energy has been used for centuries to heat homes and water, and modern technology

(photovoltaic cells) has provided a way to produce electricity from sunlight. There are two basic forms of solar energy collectors are passive and active.

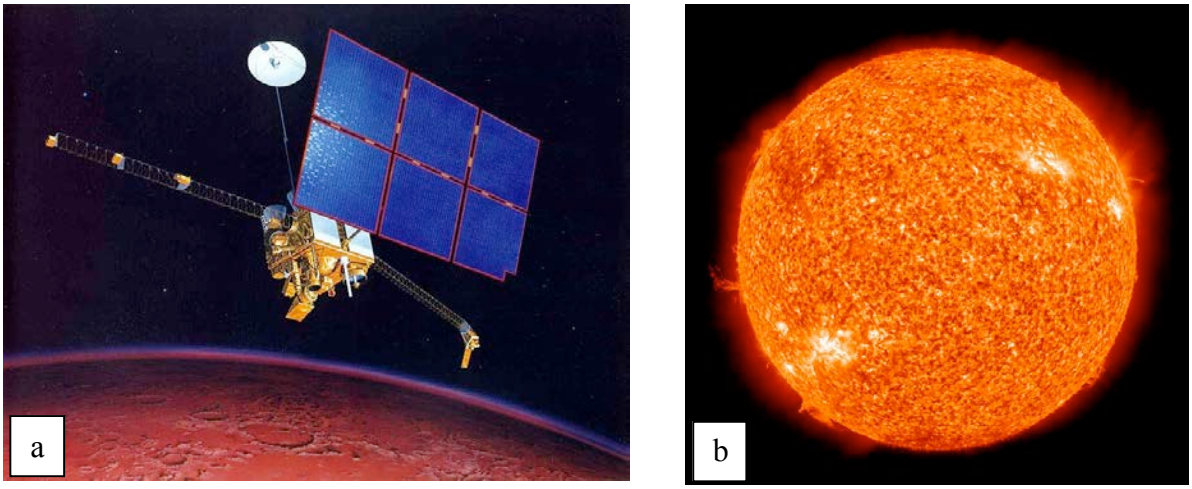


Figure 5.4. a) Mars Observer in Mars Orbit showing the solar panel. (Picture: Wikimedia Commons http://www.jpl.nasa.gov/images/spacecraft/marsobserver/craft1-browse.jpg,). b) The Sun photographed at 304 angstroms by the Atmospheric Imaging Assembly (AIA 304) of NASA's Solar Dynamics Observatory (SDO). This is a false-color image of the Sun observed in the extreme ultraviolet region of the spectrum.
http://sdo.gsfc.nasa.gov/assets/img/browse/2010/08/19/20100819_003221_4096_0304.jpg, NASA/SDO (AIA)

5.2.1 Passive and Active Solar Energy

Passive solar energy uses heating and cooling strategies that have been used historically such as natural ventilation, solar heat gain, solar shading and efficient insulation. Passive solar space heating happens when the sun shines through the windows of a building and warms the interior (**Figure 5.5**). Building designs that optimize passive solar heating usually have south-facing windows that allow the sun to shine on solar heat-absorbing walls or floors during the winter. The solar energy heats the building by natural radiation and convection and the heat is trapped, absorbed and stored by materials with high thermal mass (usually bricks or concrete) inside the house. The heat is released at night when needed to warm up the building as it loses heat to the cooler outdoors. Window overhangs or shades block the sun from entering the windows during the summer to keep the building cool.

Active solar energy systems require the input of some energy to pump a heat-absorbing fluid medium through a *collector* to store and distribute the energy. Fans or pumps circulate air or heat-absorbing liquids through collectors and then transfer the heated fluid directly to a room or to a heat storage system. The solar collectors are either concentrating or non-concentrating. In the **non-concentrating collectors**, the surface area that intercepts the solar radiation is the same as the area absorbing the radiation. *Flat-plate collectors* are the most common type of non-concentrating collectors and are used when temperatures lower than 200°F are sufficient. The collectors absorb and transfer heat to a fluid (water or air) which is then circulated to provide heating to a building. In **concentrating collectors** the surface area intercepting the solar radiation is greater, sometimes hundreds of times greater, than the absorber area. The collector

focuses or concentrates solar energy onto an absorber. The collector usually moves so that it maintains a high degree of concentration on the absorber.

Figure 5.5. Passive solar building near Crestone, Colorado (image from Wiki Commons)

Photovoltaic (PV) Cells

Solar photovoltaic (PV) devices, or solar cells, change sunlight directly into electricity. PV uses semiconducting materials such as silicon to produce electricity from sunlight: when light hits the cells, the material produces free electrons that migrate across the cell, creating an electric current. Small PV cells can power calculators, watches, and other small electronic devices. Arrangements of many solar cells in PV panels and arrangements of multiple PV panels in PV arrays can produce electricity for an entire house (**Figure 5.6a**). Some PV power plants have large arrays that cover many acres to produce electricity for thousands of homes.

Hundreds of thousands of houses and buildings around the world have PV systems on their roofs. Many multi-megawatt PV power plants have also been built. Covering 4% of the world's desert areas with photovoltaics could supply the equivalent of all of the world's electricity. The Gobi Desert alone could supply almost all of the world's total electricity demand.

Solar Thermal Power Plants

Solar thermal power plants, like the one in **Figure 5.6b** use concentrating solar collector systems to collect and concentrate sunlight to produce the high temperature heat needed to generate electricity. All solar thermal power systems have solar energy collectors with two main components: *reflectors* (mirrors) that capture and focus sunlight onto a *receiver*. In most types of systems, a heat-transfer fluid is heated and circulated in the receiver and used to produce steam. The steam is converted into mechanical energy in a turbine, which powers a generator to produce electricity. Solar thermal power systems have tracking systems that keep sunlight focused onto the receiver throughout the day as the sun changes position in the sky.

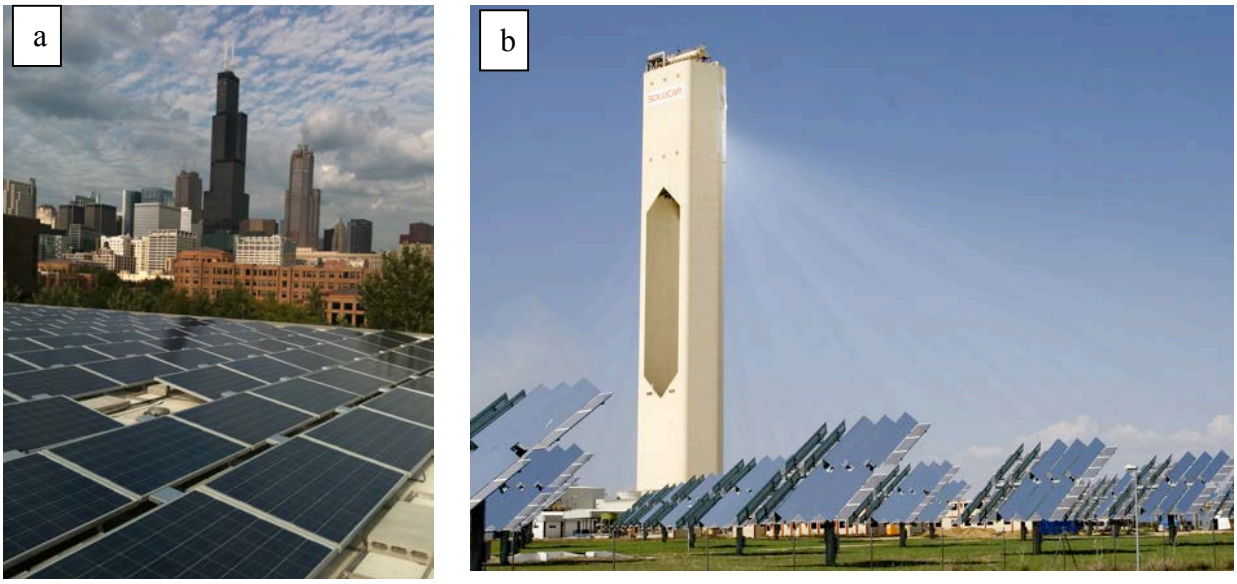


Figure 5.6: a) Rooftop Solar Installations on Douglas Hall at the University of Illinois at Chicago has no effect on land resources, while producing electricity with zero emissions. Source: Office of Sustainability. **b**) Solucar PS10 solar power tower in Andalusia, Spain, is a solar thermal power plant that generates electricity commercially. (Photo by Afloresm Solucar PS10 CC BY 2.0)

5.2.3 Environmental Impacts of solar energy

Solar power has minimal impact on the environment, depending on where it is placed. In 2009, one percent of the renewable energy generated in the United States was from solar power (1646 MW) out of the eight percent of the total electricity generation that was from renewable sources. The manufacturing of photovoltaic (PV) cells generates some hazardous waste from the chemicals and solvents used in processing. Often solar arrays are placed on roofs of buildings or over parking lots or integrated into construction in other ways. However, large systems may be placed on land and particularly in deserts where those fragile ecosystems could be damaged if care is not taken. Some solar thermal systems use potentially hazardous fluids (to transfer heat) that require proper handling and disposal. Concentrated solar systems may need to be cleaned regularly with water, which is also needed for cooling the turbine-generator. Using water from underground wells may affect the ecosystem in some arid locations.

5.3 BIOMASS ENERGY

Biomass energy is from the energy stored in materials of biological origin such as plants and animals. Biomass energy is the oldest energy source used by humans. Until the Industrial Revolution prompted a shift to fossil fuels in the mid-18th century, biomass energy was the world's dominant fuel source. It includes *direct combustion* of solid biomass to provide energy for heating, cooking, and even generating electricity. The most common source for direct combustion is wood, but energy can also be generated by burning animal manure (dung), herbaceous plant material (non-wood), peat (partially decomposed plant and animal tissues), or converted biomass such as charcoal (wood that has been partially burned to produce a coal-like

substance). Biomass can also be converted into a *liquid biofuels* used to power vehicles such as ethanol from corn, sugarcane residue and soybeans or even used cooking oil for biodiesel. Biomass energy can also be in *gaseous* form such as methane. Currently, about 12 percent of the world's energy comes from biomass (**Figure 5.2**). Biomass is most frequently used as a fuel source in many developing nations, but with the decline of fossil fuel availability and the increase in fossil fuel prices, biomass is increasingly being used as a fuel source even in developed nations.

5.3.1 Direct combustion of solid biomass

Using wood and charcoal made from wood, for heating and cooking can replace fossil fuels and may result in lower CO_2 emissions. If wood is harvested from forests or woodlots that have to be thinned or from urban trees that fall down or needed be cut down anyway, then using it for biomass does not impact those ecosystems. However, wood smoke contains harmful pollutants like carbon monoxide and particulate matter. For home heating, it is most efficient and least polluting when using a modern wood stove or replace insert that are designed to release small amounts of particulates. However, in places where wood and charcoal are major cooking and heating fuels such as in industrializing countries, the wood may be harvested faster than trees can grow resulting in deforestation.

Biomass is also being used on a larger scale, where small power plants are powered by biomass such as woodchips (**Figure 5.7**). For instance, Central State Hospital, Milledgeville, GA has a woodchip burning plant that was the most advanced system available for its time and operating today. Colgate University in Hamilton, New York, has had a wood-burning boiler since the mid-1980's that processes about 20,000 tons of locally and sustainably harvested wood chips, the equivalent of 1.17 million gallons (4.43 million liters) of fuel oil, avoiding 13,757 tons of emissions, and saving the university over $1.8 million in heating costs. The University's steam-generating wood-burning facility now satisfies more than 75 percent of the campus's heat and domestic hot water needs. For more information about this, click here Colgate University.

Figure 5.7. A biomass (woodchip) power plant in Germany. Image from Wikimedia Public Domain.

Waste products of various industries and processes such as lumber mill sawdust, paper mill sludge, yard waste, oat hulls from an oatmeal processing plant, woody debris from logging, organic waste from feedlots, and residue from crops can also be used for energy. Waste to energy processes are gaining renewed interest as they can solve two problems at once: 1) disposal of waste as landfill capacity decreases; and 2) production of energy from a renewable resource. In the United States, several plants have been constructed to burn urban biomass waste and use the energy to generate electricity. Many of the environmental impacts are similar to those of a coal plant like air pollution, ash generation, etc. Since the fuel source is less standardized than coal and hazardous materials may be present in municipal solid waste (MSW), or garbage, incinerators and waste-to-energy power plants need to clean the stack gases of harmful materials. The U.S. EPA regulates these plants very strictly and requires anti-pollution devices to be installed. If not contained, waste is distributed in many ecosystems. The ash from these plants may contain high concentrations of various metals that were present in the original waste. If ash is clean enough it can be recycled as a MSW landfill cover or to build roads, cement block and artificial reefs. Also, while incinerating at high temperature many of the toxic chemicals may break down into less harmful compounds.

5.3.2 Gaseous Biomass

Organic material can be converted to methane, the main component of natural gas, by anaerobic decomposition or fermentation, a process that utilizes anaerobic bacteria. Methane is a relatively clean fuel that burns efficiently. It can be generated from any kind of organic waste such as municipal sewage and garbage, livestock manure, kitchen, and garden scraps. In fact, municipal landfills are active sites of methane production contributing annually to methane in the atmosphere and to global warming. This gas can and is currently being captured by numerous landfills around the United States that burn it to generate electricity at power plants or supply it to homes for heating. The electricity may replace electricity produced by burning fossil fuels and result in a net reduction in CO_2 emissions. Burning methane produced from manure provides more heat than burning the dung itself, and the sludge left over from bacterial digestion is a rich fertilizer, containing healthy bacteria as well as most of the nutrients originally in the dung. The main environmental impacts are from the construction of the plant itself. Burning methane releases CO_2 and although CO_2 is a greenhouse gas, its global warming potential is much lower than that of methane (see chapter 7). Also, since this methane if from organic waste resulting from ongoing photosynthetic processes, it is considered carbon-neutral, unlike CO_2 from fossil fuels.

5.3.3 Liquid Biofuels

Biofuels are transportation fuels produced from plant sources and used to power vehicles. The most common ones are ethanol and biodiesel. **Ethanol**, also known as ethyl alcohol or grain alcohol, is produced by fermenting crops such as corn, sugarcane, and other crops and then mixed with conventional gasoline. As an additive, ethanol lowers reliance on conventional oil and increases the combustion efficiency of gasoline, reducing pollutant emissions. In Brazil, which has a sizeable ethanol industry based on sugarcane, all gasoline sold contains 25 percent alcohol, and over 70 percent of the cars sold each year can run on either ethanol or gasoline. Ethanol-gasoline mixtures burn cleaner than pure gasoline but are more volatile and thus have higher "evaporative emissions" from fuel tanks and dispensing equipment. These emissions

contribute to the formation of harmful, ground level ozone and smog. Gasoline requires extra processing to reduce evaporative emissions before it is blended with ethanol.

Biodiesel which is essentially vegetable oil, can also be derived from a wide range of plant sources, including rapeseed, sunflowers, and soybeans, and can be used in most conventional diesel engines. Biodiesel can also be made from used vegetable oil and has been produced on a very local basis. Because it burns more cleanly than its petroleum-based counterpart, biodiesel can reduce pollution from heavy-duty vehicles such as trucks and buses. Compared to petroleum diesel, biodiesel combustion produces less sulfur oxides, particulate matter, carbon monoxide, and unburned and other hydrocarbons, but more nitrogen oxide.

Calculating the net energy or CO_2 generated or reduced in the process of producing the biofuel is crucial to determining its environmental impact. Biofuels may be derived from parts of plants not used for food (cellulosic biomass) thus reducing that impact. Cellulosic ethanol feedstock includes native prairie grasses, fast growing trees, sawdust, and even waste paper. Also, in some parts of the world, large areas of natural vegetation and forests have been cut down to grow sugarcane for ethanol and soybeans and palm-oil trees to make biodiesel. This is not sustainable land use.

Biomass energy may be considered to be **carbon-neutral** because the plants that are used to make them (such as corn and sugarcane for ethanol, or soy beans and palm oil trees for biodiesel) take up CO_2 from the atmosphere through photosynthesis as they grow and may offset the CO_2 produced when burned. If the biomass is not burned for energy generation, the carbon contained in the biomass would still be returned to the atmosphere as CO_2 when the organisms die and decompose to complete the cycle. Burning biomass, therefore, does not result in new additional CO_2 in the atmosphere but rather returns carbon that came from the atmosphere and used to produce the biomass in the first place. On the other hand, burning fossil fuels introduces new carbon into the atmosphere that was previously stored deep in the Earth's crust and would have stayed there if we (humans) did not extract it.

5.3.4 Environmental Impacts of Biomass Energy

A major challenge of biomass is determining if it is really a more sustainable option. The energy content of some biomass energy sources may not be as high as fossil fuels so more must be burned to generate the same energy. It often takes energy to make energy and biomass is one example where the processing to make it may not be offset by the energy it produces. If traditional monoculture crops like corn or soybeans are used, they require major quantities of fossil fuel to manufacture fertilizer, run farm machines, and ship the fuel to markets, so these biofuels do not always offer significant net energy savings over gasoline and diesel fuel. In such instances, biofuels may not be carbon-neutral because the process of producing the biofuels results in more CO_2 added to the atmosphere than that removed by the growing crops. Even if the environmental impact is net positive, for example if renewable energy sources are used to make the biofuels, the economic and social effects of growing plants for fuels need to be considered. The land, fertilizers, water, and energy used to grow biofuel crops could be used to grow food crops instead. The competition of land for fuel vs. food can increase the price of food, which has a negative effect on society. It could also decrease the food supply and increase malnutrition and starvation globally.

Trees that are cut for firewood are frequently not replanted. In order to be used sustainably, one tree must be planted for every one cut down. If too much biomass is taken it can reduce forest and grassland contributions to ecosystem services. Forests and grasslands help take

CO_2 out of the atmosphere through photosynthesis and the loss of photosynthetic activity results in increased amounts of CO_2 in the atmosphere and contribute to global warming since CO_2 is a greenhouse gas. Burning biomass directly (wood, manure, etc.) produces high particulate material pollution (see chapter 6 on Air Pollution), produces CO_2 and deprives the soil of nutrients it normally would have received from the decomposition of the organic matter. Each type of biomass energy source, therefore, must be evaluated for its full life-cycle impact in order to determine if it is really advancing sustainability and reducing environmental impacts.

5.4 WIND POWER

Wind is a renewable energy source that uses the power of moving air to generate electricity. Wind turbines use blades to collect the wind's kinetic energy. Wind flows over the blades creating lift (similar to the effect on airplane wings), which causes the blades to turn. The blades are connected to a drive shaft that turns an electric generator, which produces electricity (**Figure 5.8**). Wind turbines are becoming a more prominent sight across the United States, even in regions that are considered to have less wind potential. Wind turbines (often called windmills) do not release emissions that pollute the air or water (with rare exceptions), and they do not require water for cooling. The U.S. wind industry had 40,181 MW of wind power capacity installed at the end of 2010, with 5,116 MW installed in 2010 alone, providing more than 20 % of installed wind power around the globe. According to the American Wind Energy Association, over 35 % of all new electrical generating capacity in the United States since 2006 was due to wind, surpassed only by natural gas.

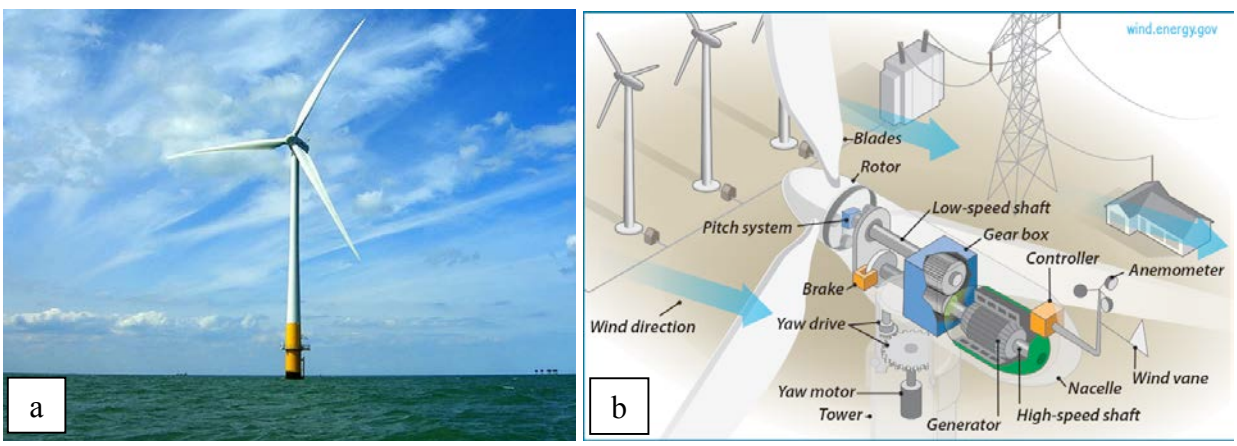


Figure 5.8. a) This wind turbine in the Thames Estuary in the UK is an example of induction at work, (credit: Phault, Flickr). Wind pushes the blades of the turbine, spinning a shaft attached to magnets, see image **b** for parts. The magnets spin around a conductive coil, inducing an electric current in the coil, and eventually feeding the electrical grid. Follow this link for an Animation.

Most windmills generate about 1kW of electricity, which is only practical for decentralized power generation. California has about 17,000 windmills with a capacity of about 1,400 MW. This is about 80% of all windmills in the U.S. In West Europe windmill generators are quite common. Since a wind turbine (**Figure 5.8**) has a small physical footprint relative to the amount of electricity it produces, many wind farms are located on crop, pasture, forest land, or coastal areas. They contribute to economic sustainability by providing extra income to farmers

and ranchers, allowing them to stay in business and keep their property from being developed for other uses. For example, energy can be produced by installing wind turbines in the Appalachian Mountains of the United States instead of engaging in mountain top removal for coal mining.

5.4.1 Environmental Impacts of Wind Energy

Off shore wind turbines on lakes or the ocean may have smaller environmental impacts than turbines on land. Wind turbines do have a few environmental challenges. There are aesthetic concerns to some people when they see them on the landscape. A few wind turbines have caught on fire, and some have leaked lubricating fluids, though this is relatively rare. Some people do not like the sound that wind turbine blades make.

Turbines have been found to cause bird and bat deaths particularly if they are located along their migratory path. This is of particular concern if these are threatened or endangered species. There are ways to mitigate that impact and it is currently being researched.

There are some small impacts from the construction of wind projects or farms, such as the construction of service roads, the production of the turbines themselves, and the concrete for the foundations. However, overall life cycle analysis has found that turbines make much more energy than the amount used to make and install them.

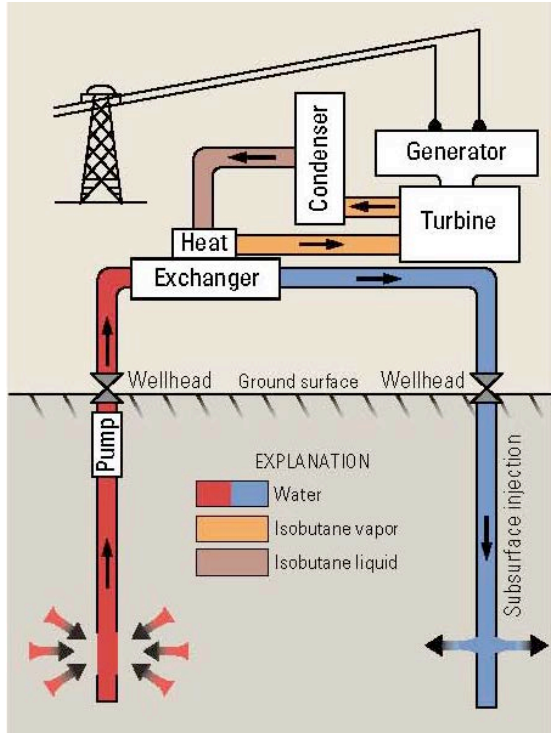
5.5 GEOTHERMAL ENERGY

Geothermal energy uses heat from the Earth's internal geologic processes in order to produce electricity or provide heating. The subsurface temperature of the Earth provides an endless energy resource. One source of geothermal energy is steam. Groundwater percolates down through cracks in the subsurface rocks until it reaches rocks heated by underlying magma, and the heat converts the water to steam. Sometimes this steam makes its way back to the surface in the form of a geyser or hot spring. Wells can be dug to tap the steam reservoir and bring it to the surface, to drive generating turbines and produce electricity (**Figure 5.9 a**). Hot water can be circulated to heat buildings. Regions near tectonic plate boundaries have the best potential for geothermal activity.

A geothermal system requires heat, permeability, and water. The heat from the Earth's core continuously flows outward. Sometimes the heat, as magma, reaches the surface as lava, but it usually remains below the Earth's crust, heating nearby rock and water — sometimes to levels as hot as 700°F. When water is heated by the earth’s heat, hot water or steam can be trapped in permeable and porous rocks under a layer of impermeable rock and a geothermal reservoir can form. Geothermal energy can be used for electricity production, for commercial, industrial, and residential direct heating purposes, and for efficient home heating and cooling through geothermal heat pumps.

To develop electricity from geothermal resources, wells are drilled into a geothermal reservoir. The wells bring the geothermal water to the surface, where its heat energy is converted into electricity at a geothermal power plant (**Figure 5.9 b**). Geothermal power plants do not burn fuel to generate electricity so their emission levels are very low.

a



b

Figure 5.9. **a**) Installing a Geothermal Pipe System Drilling to install geothermal ground source pipe system. Source: Office of Sustainability. **b**) Electricity generation at a moderate-temperature hydrothermal system. The geothermal water is used to boil a second fluid (isobutane in this example) whose vapor then drives a turbine generator. The wastewater is injected back into the subsurface. Source: USGS.

5.5.1 Environmental Impacts of Geothermal Energy

The environmental impact of geothermal energy depends on how it is being used. Direct use and heating applications have almost no negative impact on the environment. Geothermally heated water can release dissolved gases, including carbon dioxide, methane, ammonia and hydrogen sulfide, although these are usually in very small quantities when compared to those released from fossil fuel plants. In addition, geothermal plants use scrubber systems to clean the air of hydrogen sulfide that is naturally found in the steam and hot water. They emit 97 % less acid rain-causing sulfur compounds than are emitted by fossil fuel plants.

Even though geothermal energy is renewable, not every plant built to capture this energy will be able to operate indefinitely because the energy relies on groundwater recharge. If the heated water is used faster than the recharge rate of groundwater, the plant will eventually run out of water. The Geysers in California started experiencing this and operators responded by injecting municipal wastewater into the ground to replenish the supply. Also, patterns of geothermal activity in the Earth's crust naturally shift over time and an area that produces hot groundwater now may not always so do. The water of many hot springs is laced with salts and minerals that corrode equipment, shorten the lifetime of plants and increase maintenance costs.

Electrical power is restricted to regions where energy can be tapped from naturally heated groundwater but most areas of the world are not rich in naturally heated groundwater. Engineers are trying to overcome this by drilling deeply into dry rock, fracture the rock and pump in cold

water which becomes heated and drawn up through an outlet well and used to generate power. However, this approach is said to trigger minor earthquakes.

5.6 HYDROELECTRIC POWER (HYDROPOWER)

This is the second largest source of renewable energy used, next to biomass energy. Majority of hydropower currently comes from dams built across a river to block the flow of river water. The water stored behind the dam contains potential energy (see chapter 4) and when released, the potential energy is converted to kinetic energy as the water rushes down. This energy is used to turn blades of turbines and causing a generator to generate electricity. Electricity generated in the powerhouse of a dam is transmitted to the electric grid by transmission lines while the water flows into the riverbed below the dam and continues down river. An alternative approach considered less disruptive involves diverting a portion of the river's water through a pipe or channel and passed through a powerhouse to generate electricity and returned to the river. Another approach involves pumping water from a lower reservoir to a higher reservoir and then allowed to flow downhill through a turbine, generating electricity. This approach, however, requires energy input to pump the water.

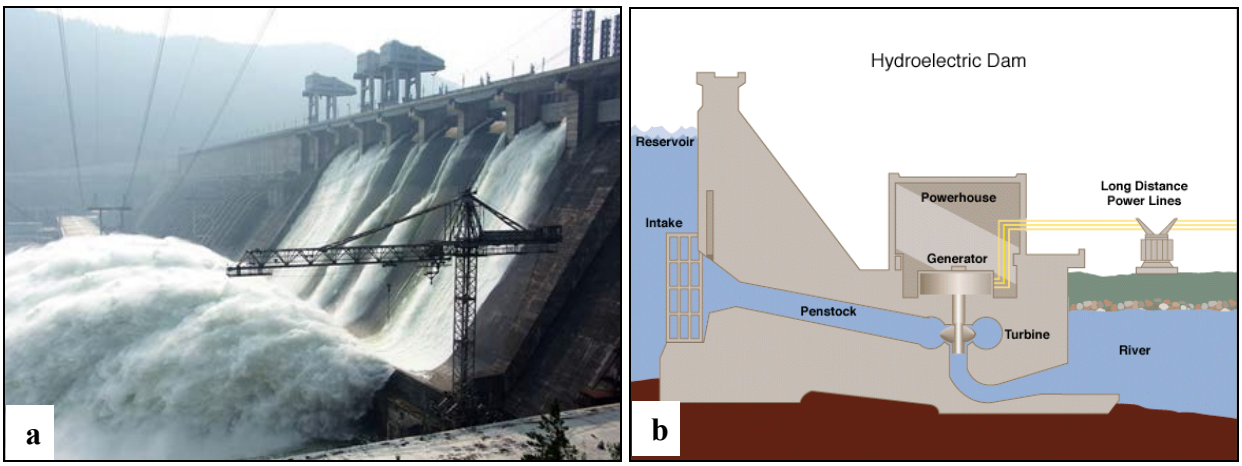


Figure 5.10. a) Hydroelectric facility (credit: Denis Belevich, Wikimedia Commons); **b)** An illustration showing how water is funneled through a portion of the dam to rotate turbines and generate electricity. (Image from Wikimedia, public domain).

Figure 5.11 shows the Hoover Power Plant located on the Colorado River. In the U.S., hydroelectric plants account for about 10% of total production and account for about 35 % of the United States' renewable energy consumption. In 2003 capacity was at 96,000 MW and it was estimated that 30,000 MW capacity is undeveloped. Energy produced can be calculated and modeled as shown in **Figure 5.12**.

Figure 5.11. a) A view of the Hoover dam from above (credit Adam Kliczek). **b)** Hydroelectric generators at the Hoover dam (credit: Jon Sullivan).

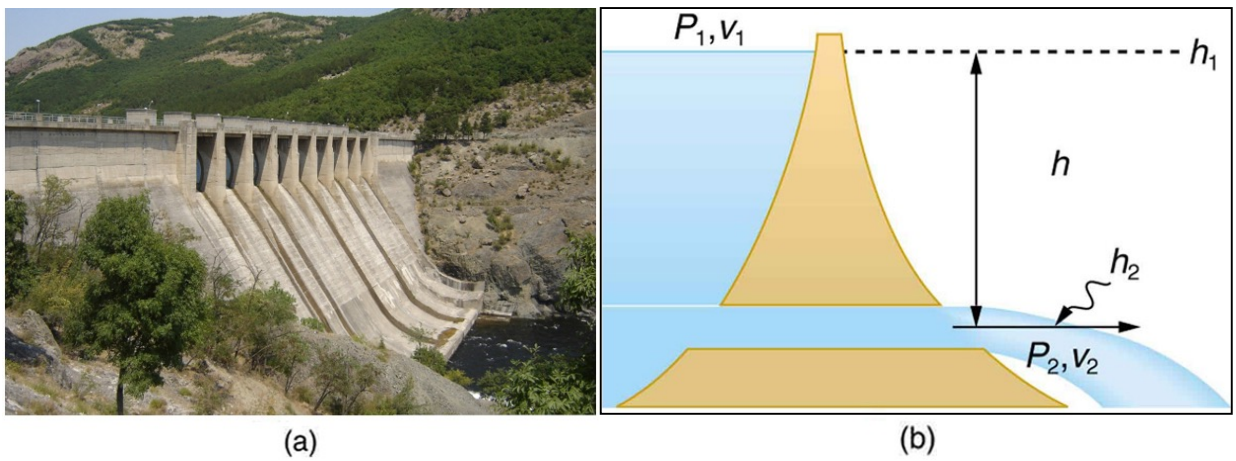


Figure 5.12. (a) Water gushes from the base of the Studen Kladenetz dam in Bulgaria. (credit: Kiril Kapustin; http://www.ImagesFromBulgaria.com) (b) In the absence of significant resistance, water flows from the reservoir with the same speed it would have if it fell the distance *h* without friction.

5.6.1 Environmental Impacts of Hydroelectric Power

Hydropower (hydro-electric) is considered a clean and renewable source of energy since it does not directly produce emissions of air pollutants and the source of power is regenerated. However, hydropower dams, reservoirs, and the operation of generators can have serious environmental impacts. A dam that is used to create a reservoir or to divert water to a run-of-river hydropower plant can obstruct migration of fish to their upstream spawning areas in areas where salmon must travel upstream to spawn, such as along the Columbia River in Washington and Oregon. Hydro turbines kill and injure some of the fish that pass through the turbine although there are ways to reduce that effect. This problem can be partially alleviated by using 'fish ladders' that help the salmon get up the dams.

A reservoir and operation of the dam can affect the natural water habitat due to changes in water temperatures, chemistry, flow characteristics, and silt loads, all of which can lead to

significant changes in the ecology and physical characteristics of the river upstream and downstream. Construction of reservoirs may cause natural areas, farms, and archeological sites to be covered and force populations to relocate and result in the loss of scenic rivers

Carbon dioxide and methane may also form in reservoirs where water is more stagnant and be emitted to the atmosphere. The exact amount of greenhouse gases produced from hydropower plant reservoirs is uncertain. If the reservoirs are located in tropical and temperate regions, including the United States, those emissions may be equal to or greater than the greenhouse effect of the carbon dioxide emissions from an equivalent amount of electricity generated with fossil fuels (EIA, 2011 p. 333).

5.6.2 Potential of Tidal Power

Tidal power involves placing turbines in zones of the ocean with significant tides and currents, and using the power of flowing water to turn the blades of a turbine to generate electricity. Ocean power systems are still being researched and currently still experimental. For example, the Bay of Fundy, which has a 15 m tide, a dam constructed across the estuary would let water enter on the incoming tide, then release the water through turbines at low tide. The energy potential is great http://www.ialtenergy.com/tidal-power-news.html , and so is the environmental cost. Tapping tidal energy resources involves building major dams on inlets and estuaries that are prized for other purposes, so few tidal energy facilities have been developed. Harnessing waves and currents on a significant scale will involve designing turbine structures that are large, inexpensive, and can operate for long periods under the physical stresses and corrosive forces of ocean environments. Though proposed, a tidal power plant has not been constructed at Fundy. There is a 240,000 kW tidal plant at La Rance, France.

5.7 OTHER ALTERNATIVE RENEWABLE ENERGY SOURCES

5.7.1 Hydrogen

Hydrogen gas may be an important clean fuel of the future. Hydrogen is considered an energy carrier, like electricity and batteries, it carries energy that can be converted for use later. Hydrogen gas does not tend to exist freely but rather hydrogen atoms bind to other atoms and molecules becoming incorporated in everything from water to organic compounds. Therefore, to obtain hydrogen gas for fuel, energy is needed to force these substances to release their hydrogen atoms. One such procedure is known as **electrolysis** in which an electric current is passed through water to decompose the water molecule into oxygen and hydrogen **(Figure 5.13)**. Hydrogen can also be produced from hydrocarbons such as natural gas and coal, fermentation of plant waste material, and using algae.

The nation of Iceland is attempting to become the first hydrogen based energy economy using its abundant geothermal energy resources. Some energy experts believe that combining hydrogen fuel and electricity could serve as a basis for a clean, safe, and energy efficient energy system. Electricity generated from intermittent renewable sources such as wind and solar can be used to produce hydrogen fuel for fuel cells that would then generate electricity to power vehicles, computers, heat homes and many other uses. An energy system based on hydrogen would alleviate dependence on foreign fuels and help fight climate change. Hydrogen is the most abundant element in the universe and we will never run out of it.

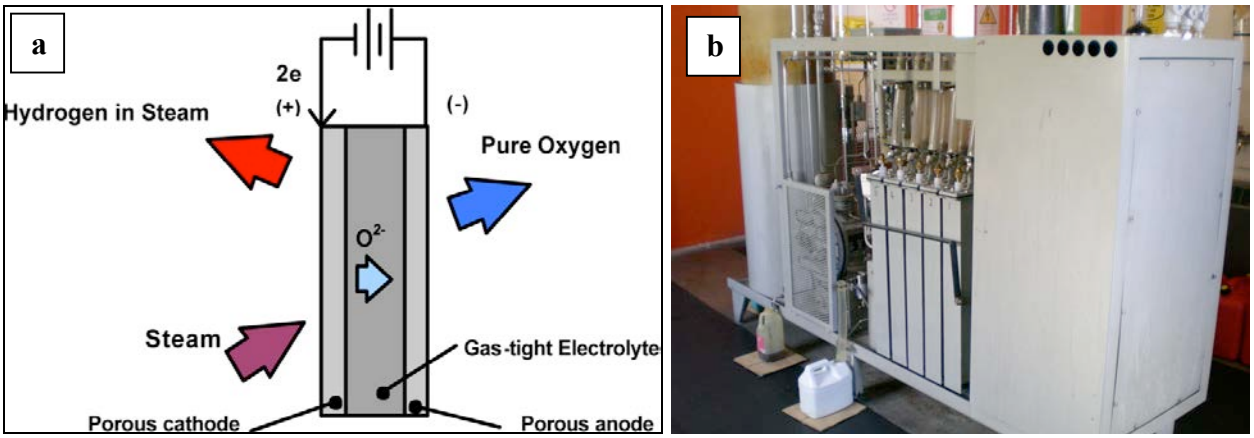


Figure 5.13 a) An electric current passed through water resulting in the separation of hydrogen atoms from oxygen to produce the hydrogen fuel. **b**) An electrolyser used in the production of hydrogen by CambridgeBayWeather. After production the hydrogen is used to inflate weather balloons to which a radiosonde is attached. The oxygen produced is vented to the outside.

Fuel Cells

Fuel cells are highly efficient power plants that produce electricity using hydrogen fuel in a chemical reaction that is a reverse of the electrolysis process that produced the hydrogen fuel (**Figure 5.14**). Energy is released by an exothermic electrochemical reaction that combines hydrogen and oxygen ions through an electrolyte material to generate electricity and heat. Experimental fuel cells that can power automobiles have been developed (**Figure 5.14**).

Figure 5.14: The electrochemical processes showing how hydrogen fuel is combined with oxygen generating heat energy along with water as a waste product. Some vehicles that use the fuel cell include buses (photo is a hydrogen fuel bus on Tower Bridge London, photo by Sludge G.), cars (The Toyota Fine N car based on fuel cell technology, photo by Chris 73, CC BY-SA 3.0) and motorcycles (Suzuki Burgman Fuel Cell cutaway model shown here, Photo by Mario CC BY-SA 3.0).

Challenges of Hydrogen

Currently, the infrastructure for using hydrogen fuel is lacking and converting a nation such as the United States to hydrogen would require massive and costly development of facilities to produce, store, transport, and provide the fuel. The environmental impact of hydrogen production itself depends on the source of material used to supply the hydrogen. For example, biomass and fossil fuel sources result in carbon-based emissions. Some research suggests that leakage of hydrogen from its production, transport, and use could potentially deplete stratospheric ozone. Research into this is still ongoing.

5.7.2 Electric cars

Electric cars are vehicles that solely depend on electricity to work. They are charged using fossil fuel energy sources (**Figure 5.15 a**), but they are very efficient. Although it might seem like science fiction the electric car is already here, and has been here for the last hundred years. The main problem with the electric car is that it cannot go very far before it needs to be recharged, something that takes between three to six hours. Different models have been explored (**Figure 5.15 b**), but for now most cars are equipped as a hybrid with a back up reservoir using fossil fuel.

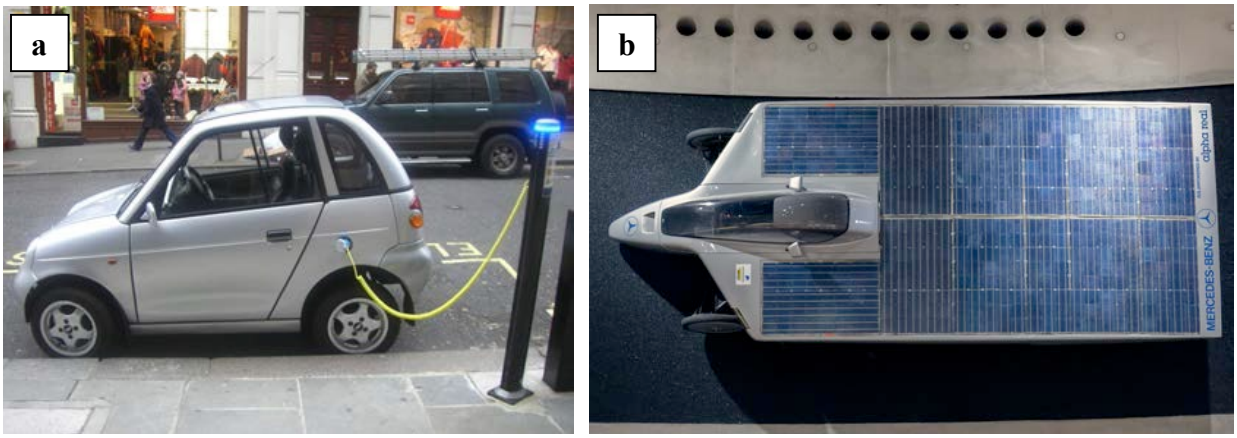


Figure 5.15. a) This REVAi, an electric car, gets recharged on a street in London. (credit: Frank Hebbert). **b**) 1985 Mercedes-Benz/Alpha Real "Tour de Sol" Solarmobile; built for the 1985 Tour de Sol Centennial Rally, solar car race from Lake Constance to Lake Geneva.

5.8 POLICY AND CONSERVATION

As we finish this chapter on energy and work, it is relevant to draw some distinctions between two sometimes misunderstood terms in the area of energy use. As has been mentioned elsewhere, the "*law of the conservation of energy*" is a very useful principle in analyzing physical processes. It is a statement that cannot be proven from basic principles, but is a very good bookkeeping device, and no exceptions have ever been found. It states that the total amount of energy in an isolated system will always remain constant. Related to this principle, but remarkably different from it, is the important philosophy of energy *conservation*. Conservation has to do with seeking to decrease the amount of energy used by an individual or a group through (1) reduced consumption (e.g., turning down thermostats, driving fewer kilometers) and/or (2)

increasing conversion efficiencies in the performance of a particular task—such as developing and using more efficient room heaters, cars that have greater miles-per-gallon ratings, energy efficient compact fluorescent lights, energy efficient appliances, etc. Since energy in an isolated system is not destroyed or created, one might wonder why we need to be concerned about our energy resources, since energy is a conserved quantity. The problem is that the final result of most energy transformations is waste heat transfer to the environment and conversion to energy forms no longer useful for doing work. To state it in another way, the potential for energy to produce useful work has been "degraded" in the energy transformation.

A rational energy policy should encourage research by private industry and should provide funding for basic research, ensure fair access to alternative energy sources, encourage the internalization of external cost of fossil fuel energy, and promote the dissemination of information about the costs and benefits of alternative energy sources.

Questions:

1. Describe three major environmental challenges for fossil fuels in general or one in particular.
2. Rate the following electricity sources for their contribution to climate change from most to least: biomass, coal, solar, wind, nuclear, natural gas, oil, geothermal, hydroelectric, MSW. Is there any compelling reason not to use any of the carbon neutral (no net carbon emissions) sources?
3. Describe the environmental and social concerns associated with biofuels.

In class activities: Design a sustainable city of the future

Websites for more information and further discussion

News: algae car: http://inhabitat.com/first-algae-powered-car-attempts-to-cross-us-on-25-gallons/

For a video presentation on the different ways to use geothermal energy, visit http://geothermal.marin.org/video/vid_pt5.html

Are Electric Vehicles Better for the Environment than Gas-Powered Ones? http://www.technologyreview.com/view/517146/are-electric-vehicles-better-for-the-environment-than-gas-powered-ones/

See excel file with terminology introduced in this chapter.

Chapter 6: Air pollution

Emissions from this power plant in New Mexico contained excessive amounts of sulfur dioxide. Image from National Parks Service (Public Domain).

Learning Objectives:

By the end of this chapter, students will be able to

- Describe the composition and structure of the atmosphere.
- Explain the importance of the ozone layer, its depletion, and specific steps taken to address it.
- Distinguish between indoor and outdoor air pollution and how these compare among industrialized and less industrialized countries
- Identify natural and anthropogenic sources of air pollution
- Explain the effects of air pollution on human and ecosystem health
- Explain how the Clean Air Act legislation works and describe its outcomes

Chapter Outline

6.1 Composition and Structure of the Atmosphere 2
6.2 Ozone 4
6.3 Outdoor Air Pollution 9
6.4 Indoor Air Pollution 13
6.5 Effects of Air Pollution on Human Health 15
6.6 Acid Rain 17
6.7 Air Pollution Legislation 18

6.1 Composition and Structure of the Atmosphere

Atmosphere refers to the layer of gases that surrounds Earth and is held in place by Earth's gravitational attraction (gravity). The mix of gases in the atmosphere forms a complex system organized into layers that together support life on Earth. Although there are numerous gases, as shown in Table 6.1, the top four gases make up 99.998 % of the volume of *clean dry air* (unpolluted air that does not contain water vapor). Of this dry composition of the atmosphere **nitrogen**, by far, is the most common (78%). Nitrogen dilutes oxygen and prevents rapid or instantaneous burning at the Earth's surface, as oxygen gas is a necessary reactant of the combustion process. Nitrogen is also needed and used by living things to make proteins, though as nitrogen gas, N_2, it is unavailable to most living things. **Oxygen** is used by all living things to make molecules that are essential for life. It is also essential for aerobic respiration as well as combustion or burning. **Argon** is a non-reactive gas and we use it in light bulbs, in double-pane windows, and to preserve priceless documents such as the original Declaration of Independence and the Constitution. **Carbon dioxide** is an essential gas used by plants and other organisms to make sugar (food) through photosynthesis. This process is essential for other life as well because during photosynthesis, water molecules are split apart and their oxygen is released back to the atmosphere. Carbon dioxide also acts as a blanket that prevents the escape of heat into outer space (see more on this in Chapter 7). The atmosphere is rarely, if ever, completely dry. **Water vapor** (water in a 'gas' state) is usually present up to about 4% of the total volume depending on location. In the Earth's desert regions (30° N/S) when dry winds are blowing, the water vapor contribution to the composition of the atmosphere will be near zero.

Table 6.1: Average composition of clean dry air in the lower atmosphere

Gas	Symbol	Content	
Nitrogen	N_2	78.08%	99.998%
Oxygen	O_2	20.95%	
Argon	Ar	0.93%	
Carbon dioxide	CO_2	0.03%	
Neon	Ne	18.20 parts per million	
Helium	He	5.20 parts per million	
Krypton	Kr	1.10 parts per million	
Sulfur dioxide	SO_2	1.00 parts per million	
Methane	CH_4	2.00 parts per million	
Hydrogen	H_2	0.50 parts per million	
Nitrous oxide	N_2O	0.50 parts per million	
Xenon	Xe	0.09 parts per million	
Ozone	O_3	0.07 parts per million	
Nitrogen dioxide	NO_2	0.02 parts per million	
Iodine	I_2	0.01 parts per million	
Carbon monoxide	CO	Trace	
Ammonia	NH_3	Trace	

Source: National Weather Service http://www.srh.noaa.gov/jetstream/atmos/atmos_intro.htm

Earth's atmosphere is divided into four distinct layers based on thermal characteristics (temperature changes), chemical composition, movement, and density (Figure 6.1). The **troposphere** is the lowest layer extending from the surface up to roughly 18 km above the surface depending on location (varies from as low

as 6 km to as high as 20 km). There is continuous flow and swirling of air constantly through convection currents redistributing heat and moisture around the globe. This results in the short-lived and local patterns of temperature and moisture that we call **weather**. Because gravity holds most air molecules close to the Earth's surface, the troposphere is the densest of all layers, containing about 75% of the total mass of the atmosphere. The density of the gases in this layer decrease with height so the air becomes thinner. In response, the temperature in the troposphere also decreases with height. As one climbs higher, the temperature drops from an average around 17°C (62°F) at sea level to about -51°C (-60°F) at the **tropopause,** a sharp boundary at the top of the troposphere that limits mixing between the troposphere and the upper layers.

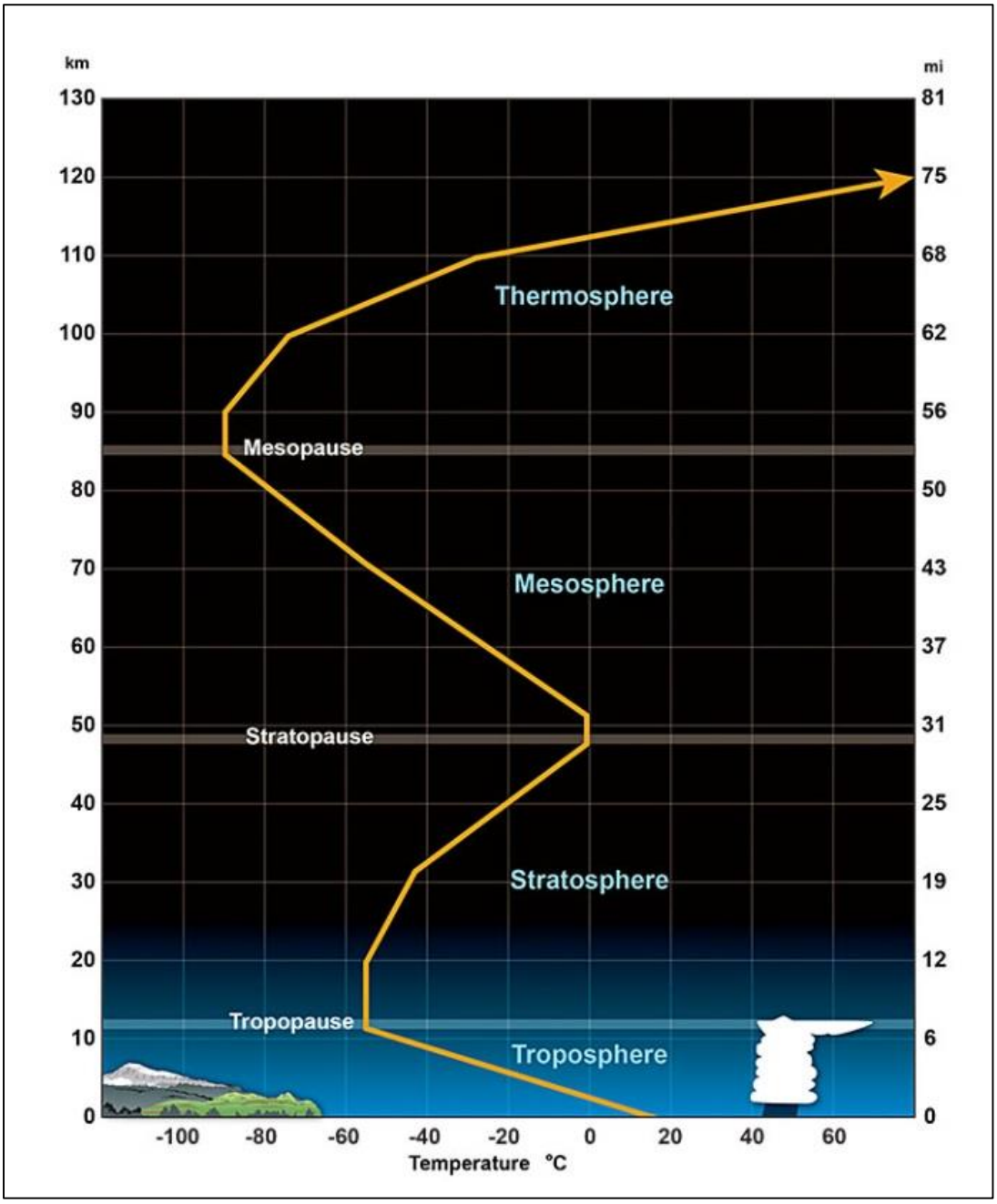


Figure 6.1: An average temperature profile through the lower layers of the atmosphere. Height (in miles and kilometers) is indicated along each side. **Source:** National Weather Service http://www.srh.noaa.gov/jetstream/atmos/atmprofile.htm

The **stratosphere** is the layer that extends from the tropopause up to about 50 km to 53 km above the Earth's surface depending on location. The proportions of most gases in this layer is similar to that of the troposphere with two main exceptions: 1) there is almost no water vapor in the stratosphere and 2) the stratosphere has nearly 1,000 times more ozone (O_3) than the troposphere. With only about 19% of the total mass of the atmosphere, the density of the stratosphere is significantly lower than the troposphere. However, temperature in this region increases with height as a result of heat that is produced during the formation of ozone (more on ozone in section 6.2). This heat is responsible for temperature increases from an average -51 °C (-60°F) at tropopause to a maximum of about -15°C (5°F) at the top of the stratosphere. This increase in temperature with height means warmer air is located above cooler air. This prevents "convection" as there is no upward vertical movement of the gases. The consequence of this little to no mixing of gases in the stratosphere makes it relatively calm but also means that once substances such as pollutants enter this zone, they can remain suspended for many years. The top of the stratosphere is bound by a boundary known as the **stratopause**.

Above the stratosphere is the **mesosphere** which extends to about 85 km above the Earth's surface. The mesosphere has no ozone molecules and the other gases such as oxygen and nitrogen continue to become less dense with height. As a result, not much ultraviolet and x-ray radiation from the sun is absorbed by molecules in this layer so temperature decreases with altitude. Both the stratosphere and the mesosphere are considered the middle atmosphere.

Between about 85 km and 600 km lies the **thermosphere**. This layer is known as the upper atmosphere. Unlike the mesosphere, the gases in this layer readily absorb incoming high energy ultraviolet and x-ray radiation from the sun. Because of this absorption, the temperature in the thermosphere increases with height and can reach as high as 2,000°C (3,600°F) near the top depending on solar activity. However, despite the high temperature, this layer of the atmosphere would still feel very cold to our skin due to the very thin atmosphere. The high temperature indicates the amount of energy absorbed by molecules but with so few in this layer, the total number of molecules is not enough to heat our skin. There's no sharp boundary that marks the end of the atmosphere. Pressure and density simply continue to decrease with distance until they become indistinguishable from the near-vacuum of outer space.

6.2 Ozone

Ozone (O_3) is a molecule in which three atoms of oxygen are bonded together. The oxygen gas in the air we breathe has two oxygen atoms bonded together (O_2). Ozone is relatively unstable and releases its third oxygen atom readily so it oxidizes and burns things more readily than oxygen gas. This characteristic makes ozone in the troposphere (ground-level ozone) an air pollutant (see section 6.3) but in the stratosphere, ozone is essential for protecting life on Earth. Ozone in the stratosphere is formed when an oxygen molecule (O_2) is broken apart into two separate oxygen atoms (O) by high-energy ultra violet (UV) solar radiation. Each of the resulting oxygen atoms (O) in turn reacts with an oxygen molecule (O_2) creating ozone (O_3) (Figure 6.2). Once produced, ozone can absorb UV radiation breaking the molecule to regenerate an oxygen molecule and a single oxygen atom. So, while ozone is continually being replenished, it is also continually being destroyed. If the rate of ozone creation is equal to the rate of destruction, the total amount will remain the same. Because there is so much oxygen in our atmosphere, this "ozone-oxygen cycle" is continuously absorbing UV radiation.

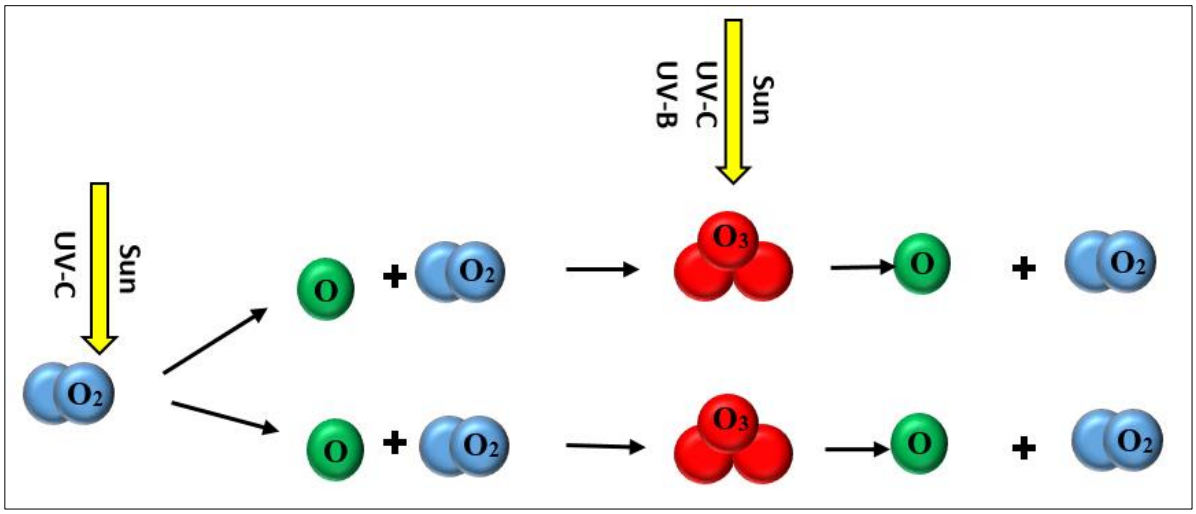


Figure 6.2: The "ozone-oxygen cycle" showing the natural formation and breaking of ozone (O_3) in the stratosphere

6.2.1 The Ozone Layer

Ozone makes up a very small proportion of the gases in our atmosphere and most of it is concentrated in a portion of the stratosphere roughly 17 – 30 km above the surface. This region, called the **ozone layer**, acts as a protective shield that protects life on the surface of the Earth by absorbing most of the harmful portions of the high-energy UV radiation coming from the sun. UV is subdivided into three types namely UV-A, UV-B, and UV-C (Figure 6.3). Of these three types, UV-A is the least energetic and least harmful but can cause some damage to living cells, resulting in sunburns and skin damage. UV-A is also not absorbed by ozone in the stratosphere and is therefore transmitted through the atmosphere to the surface of the Earth. UV-C is the most harmful and most energetic of all UV, but is strongly absorbed in both the thermosphere and the stratosphere and does not make it to the Earth's surface. UV-C is the one responsible for the splitting of oxygen molecules in the stratosphere that leads to the formation of ozone. When ozone absorbs UV it regenerates oxygen atoms and releases heat which warms the upper part of the stratosphere. Since UV-C does not make it to the Earth's surface, the most harmful form of UV radiation that reaches the surface is UV-B. However, the amount of UV-B that reaches Earth's surface is significantly reduced because most of it is absorbed by ozone in the stratosphere. Ozone is the only known gas that absorbs UV-B.

Natural conditions in the stratosphere sustain a dynamic balance between the creation and destruction of ozone which helps to ensure the continued existence of the ozone layer. Any disruption of this balance that results in a higher rate of ozone destruction than ozone creation would result in depletion of ozone. Ozone depletion, consequently, leads to significant increase in the amount of harmful UV-B radiation that reaches the Earth's surface and this what we are talking about when we discuss the **ozone problem**.

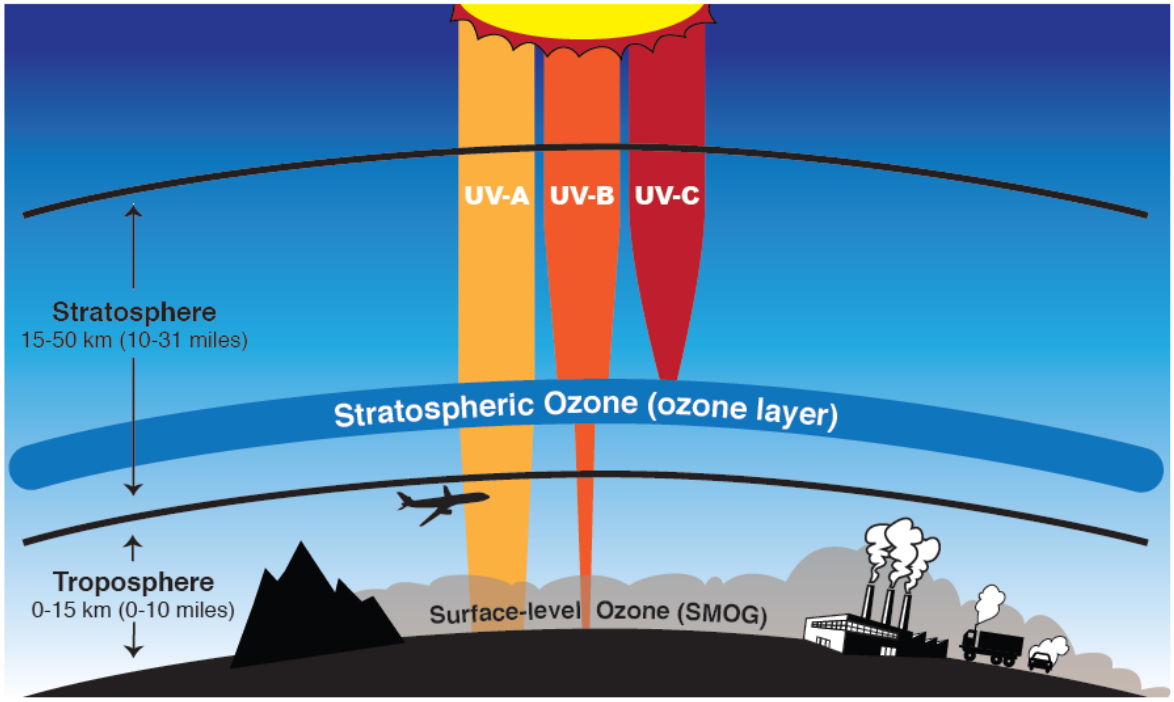


Figure 6.3: Ozone is "good" in the stratosphere because it absorbs most ultraviolet radiation. Ozone is "bad" in the troposphere because it is harmful to breathe and is the primary component of smog in summer. ***Source:*** www.nasa.gov

6.2.2 The Ozone Hole

The **Ozone Hole** is not really a "hole" but rather an area where the thickness of the ozone layer is greatly reduced. This hole is a result of ozone depletion that occurs every year during the Antarctic spring (Figure 6.4) and was first reported to the public by the British Antarctic Survey in 1985. The thickness of the ozone layer above the Antarctic continued to decline while the geographic area covered by the ozone hole continued to increase, reaching its lowest concentration (thickness) in 1994 and largest geographic area in 2000. Recent data shows that ozone concentration globally and in the Arctic and Antarctic is no longer declining.

During the long winter months of darkness over the Antarctic, atmospheric temperatures drop, creating unique conditions for chemical reactions that are not found anywhere else in the atmosphere. During this time, the Antarctic air mass is isolated from the rest of the atmosphere and circulates around the pole in what is known as the *polar vortex*. This isolation allows temperatures to drop low enough to create ice crystals at high altitudes. Ozone, nitric acid, sulfuric acid and other chlorine containing molecules are absorbed on the surfaces of these ice particles. When the sun rises over the Antarctic in the southern spring (October), light rapidly releases free chlorine atoms into the stratosphere. The chlorine atoms react with ozone breaking it down to molecular oxygen and an oxygen atom. The polar vortex keeps the ozone-depleted air inside the vortex from mixing with the undepleted air outside the vortex, hence the formation of an ozone hole.

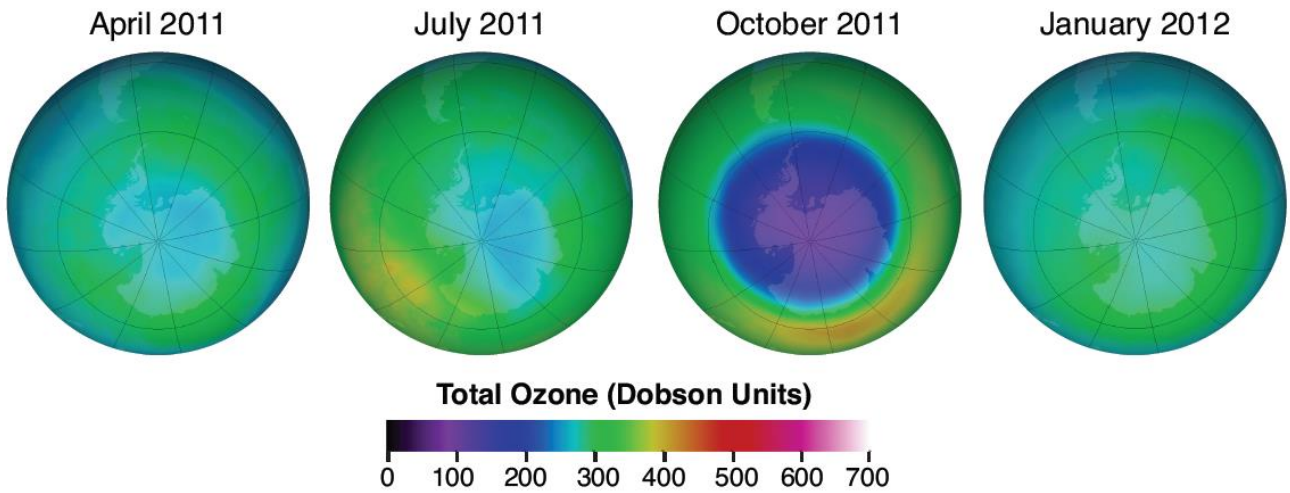


Figure 6.4: Ozone concentrations over the Antarctic region for four months representing the four seasons. Ozone concentration drops significantly during the Antarctic spring (October). ***Source:*** www.nasa.gov

6.2.3 Ozone Depletion

Global ozone concentrations change periodically with regular natural cycles such as changing seasons, winds, and long time scale sun variations. Concentrations of ozone in the atmosphere are measured in parts per billion (ppb). Scientists have been measuring ozone since the 1920's using ground-based instruments that look skyward. Satellite measurements of concentrations of atmospheric ozone began in 1970 and continue today.

Ozone depletion occurs when the rate at which ozone is broken down is greater than the rate of its creation, interfering with the dynamic balance between creation and destruction that maintains the ozone layer. When this happens, the amount of harmful UV-B radiation that reaches the Earth's surface increases. Ozone depletion was first identified over the Antarctic. Scientists suggested that reactions involving man-made chlorine-containing compounds were responsible for depleting ozone in the stratosphere. This hypothesis was based mostly on the physical and chemical properties of these compounds and knowledge about atmospheric conditions.

Chlorofluorocarbons (CFCs) are man-made compounds made up of chlorine, fluorine and carbon. These compounds were commonly used as propellants in everyday products such as shaving cream, hair spray, deodorants, paints and insecticides and as coolants in refrigerators and air conditioners. CFCs are extremely stable molecules and do not react with other chemicals in the lower atmosphere, part of the reason why they were considered a safe choice. Their stability means that they tend to remain in the atmosphere for a very long time. With the constant movement of air in the lower atmosphere, CFCs eventually make their way into the stratosphere. Exposure to ultraviolet radiation in the stratosphere breaks them apart, releasing chlorine atoms. Free chlorine (Cl) atoms then react with ozone molecules, taking one oxygen atom to form chlorine monoxide (ClO) and leaving an oxygen molecule (O_2) (Figure 6.5). The ClO reacts with other atoms freeing up the Cl making it available to react with another ozone molecule, repeating the cycle over and over resulting in ozone depletion.

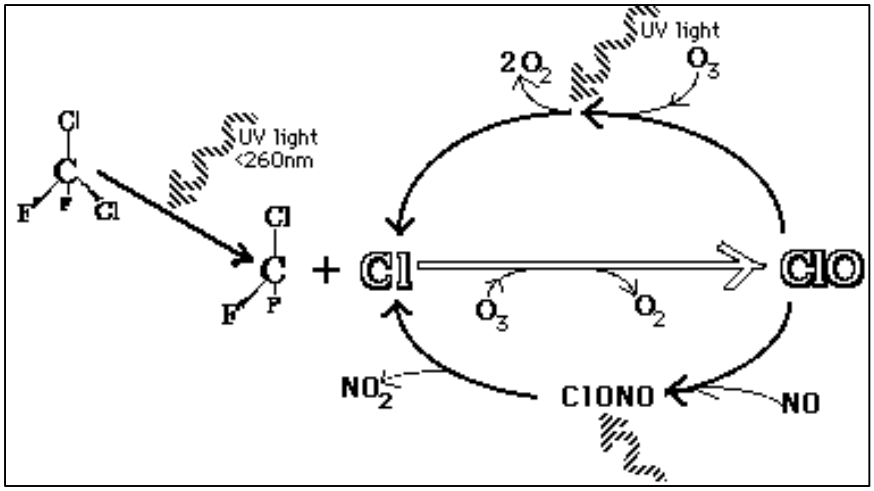


Figure 6.5: Ozone destruction. UV radiation frees a chlorine (Cl) atom from a CFC molecule, this atom reacts with ozone and produces an oxygen gas molecule and chlorine monoxide (ClO). ClO reacts with another oxygen atom, it frees up the Cl atom which then proceeds to destroy another ozone molecule.
Source: Wiki commons https://commons.wikimedia.org/wiki/Category:Ozone#/media/File:Chlorine_catalysis.GIF

If each chlorine atom released from a CFC molecule destroyed only one ozone molecule, CFCs would pose very little threat to the ozone layer. However, when a chlorine monoxide molecule encounters a free atom of oxygen, the oxygen atom breaks up the chlorine monoxide, stealing the oxygen atom and releasing the chlorine atom back into the stratosphere to destroy another ozone molecule. These two reactions happen over and over again, so that a single atom of chlorine, acting as a catalyst, destroys many molecules (about 100,000) of ozone. The consequence of stratospheric ozone depletion is increased levels of UV-B radiation reaching the Earth's surface, posing a threat to human health and the environment. Figure 6.6 shows a lower than average amount of stratospheric ozone over North America in 1997 when it was abnormally cold compared to 1984, which was warmer than average, showing that ozone depletion does not exclusively affect just the South Pole (Antarctic).

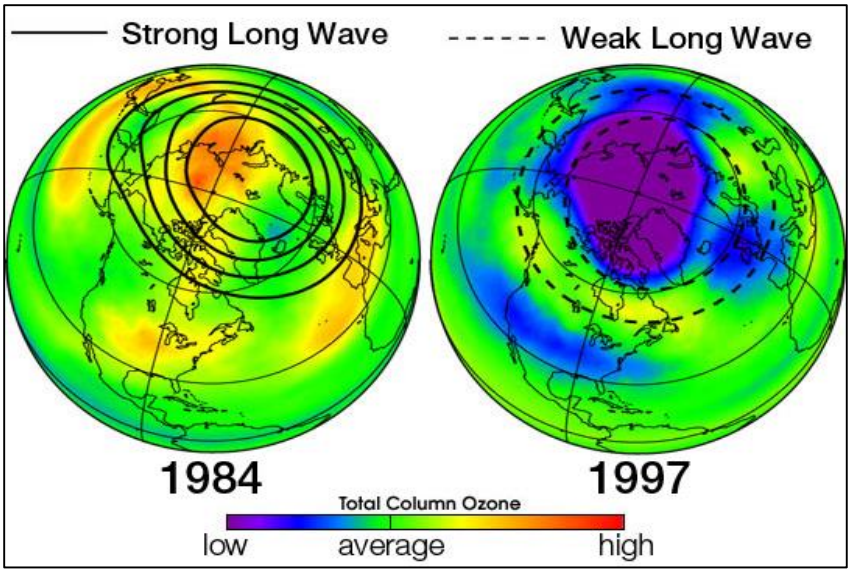


Figure 6.6: Seasonal ozone depletion over North America was lower in 1984 and greater in 1997.
Source: NASA http://earthobservatory.nasa.gov/IOTD/view.php?id=1771

6.2.4 The Montreal Protocol

International policy efforts to restrict production of ozone depleting CFCs culminated in the 1987 treaty known as the **Montreal Protocol** in which signing nations agreed to cut CFC production in half by 1998. At least five follow-up agreements since then helped to deepen the cuts, advanced timetables for compliance, and addressed additional ozone-depleting substances such as halons, methyl chloroform, carbon tetrachloride, and hydrochlorofluorocarbons (HCFCs). Most countries around the world have phased out production of the substances covered by the agreements and industry has been able to shift to safer alternative chemicals. As a result, there's evidence that the Antarctic ozone hole has stopped growing worse, although recovery is not expected anytime soon. Phasing out CFCs and HCFCs is also beneficial in protecting the earth's climate, as these substances are also very damaging greenhouse gases.

As part of the United States' commitment to implementing the Montreal Protocol, the U.S. Congress amended the Clean Air Act (section 6.7), adding provisions for protection of the ozone layer. Most importantly, the amended Act required the gradual end to the production of chemicals that deplete the ozone layer. The Clean Air Act amendments passed by Congress requires the Environmental Protection Agency (EPA) to develop and implement regulations for the responsible management of ozone-depleting substances in the United States. Under the Clean Air Act, EPA has created several regulatory programs to address numerous issues, including:

- ending the production of ozone-depleting substances,
- ensuring that refrigerants and halon fire extinguishing agents are recycled properly,
- identifying safe and effective alternatives to ozone-depleting substances,
- banning the release of ozone-depleting refrigerants during the service, maintenance, and disposal of air conditioners and other refrigeration equipment,
- requiring that manufacturers label products either containing or made with the most harmful ozone depleting substances.

6.3 Outdoor Air Pollution

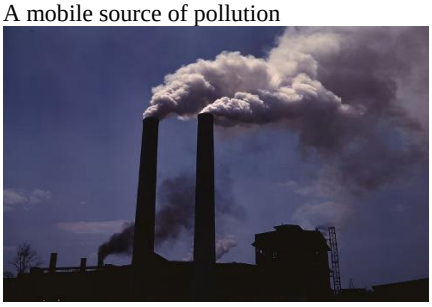
Air pollution refers to the introduction, into the atmosphere, of substances that have harmful effects on humans, other living organisms, and the environment either as solid particles, liquid droplets or gases. Air pollution can result from natural processes such as dust storms, forest fires, and volcanic eruptions, or from human activities such as biomass burning, vehicular emissions, mining, agriculture, and industrial processes. Improved technology and government policies have helped reduce most types of outdoor air pollution in many industrialized countries including the United States, in recent decades. However, outdoor air quality is still a problem in less industrialized nations, especially in megacities of rapidly industrializing nations such as China and India.

Outdoor pollutants can come from **stationary** (**point**) sources or **mobile** (**nonpoint**) sources (Figure 6.7). Stationary sources have a fixed location, for example power plant smokestacks, burning, construction sites, farmlands and surface mines among others. Mobile sources of air pollutants move from place to place while emitting pollutants. Examples of mobile sources include vehicles, aircrafts, ships, and trains.

Volcanic eruption, a natural source

Aircraft, a mobile source

A mobile source of pollution



Smokestack, a stationary source

Figure 6.7: Images showing various sources of air pollution, including natural and anthropogenic, stationary and mobile. **Source**: All images obtained from Wiki Commons https://commons.wikimedia.org/wiki/Air_pollution

Pollutants are categorized into two major types based on how they originated namely primary and secondary pollutants. **Primary pollutants** are those released directly from the source into the air in a harmful form. The primary pollutants that account for nearly all air pollution problems are carbon monoxide (58%), volatile organic compounds (VOCs, 11%), nitrogen oxides (15%), sulfur dioxides (13%), and particulate material (3%). **Secondary pollutants** are produced through reactions between primary pollutants and normal atmospheric compounds. For example, ground-level ozone forms over urban areas through reactions, powered by sunlight, between primary pollutants (oxides of nitrogen) and other atmospheric gases such as VOCs.

6.3.1 Criteria pollutants

Under the Clean Air Act (see section 6.7.1), the Environmental Protection Agency (EPA) establishes air quality standards to protect public health and the environment. EPA has set national air quality standards for six common air pollutants namely: 1) carbon monoxide; 2) ground-level ozone; 3) nitrogen dioxide; 4) Sulfur dioxide; 5) lead; and 6) particulate matter (also known as particle pollution). Of the six pollutants, particle pollution and ground-level ozone are the most widespread health threats. EPA calls these pollutants "criteria" air pollutants because it regulates them by developing human health-based and/or environmentally-based criteria (science-based guidelines) for setting permissible levels. The set of limits based on human health is called primary standards. Another set of limits intended to prevent environmental and property damage is called secondary standards.

1. **Carbon Monoxide (CO):** is a colorless, odorless gas emitted from combustion processes, specifically, the incomplete combustion of fuel. Nationally and, particularly in urban areas, the majority of CO emissions to ambient air come from mobile sources. CO can cause harmful health effects by reducing oxygen delivery to the body's organs (like the heart and brain) and tissues. At extremely high levels, CO can cause death.

2. **Ground-level ozone (O_3):** is a colorless gas with a slightly sweet odor that is not emitted directly into the air, but is created by the interaction of sunlight, heat, oxides of nitrogen (NO_x) and volatile organic compounds (VOCs). Ozone is likely to reach unhealthy levels on hot sunny days in urban environments. Emissions from industrial facilities and electric utilities, motor vehicle exhaust, gasoline vapors, and chemical solvents are some of the major sources of NO_x and VOCs.

3. **Nitrogen dioxide (NO_2)**: is one of a group of highly reactive gasses known as "oxides of nitrogen," or "nitrogen oxides (NO_x)." Other nitrogen oxides include nitrous acid and nitric acid. NO_2 is a yellowish-brown to reddish-brown foul-smelling gas that is a major contributor to smog and acid rain. Nitrogen oxides result when atmospheric nitrogen and oxygen react at the high temperatures created by combustion engines. Most emissions in the U.S. result from combustion in vehicle engines, electrical utility, and industrial combustion.

4. **Sulfur dioxide (SO_2)**: Sulfur dioxide is one of a group of highly reactive gasses known as "oxides of sulfur." The largest sources of SO_2 emissions are from fossil fuel combustion at power plants (73%) and other industrial facilities (20%). Smaller sources of SO_2 emissions include industrial processes such as extracting metals from their ores, and the burning of high sulfur containing fuels by locomotives, large ships, and non-road equipment.

5. **Lead (Pb)**: is a metal found naturally in the environment as well as in manufactured products. The major sources of lead emissions have historically been from fuels in motor vehicles (such as cars and trucks) and industrial sources. As a result of EPA's regulatory efforts to remove lead from gasoline, emissions of lead from the transportation sector dramatically declined by 95 percent between 1980 and 1999, and levels of lead in the air decreased by 94 percent during that time period. The major sources of lead emissions today are ore and metal processing and piston-engine aircraft operating on leaded aviation gasoline. Today, the highest levels of lead in air are usually found near lead smelters.

6. **Particulate material** (PM), sometimes known simply as "**particulates**" refers to solid particles and liquid droplets suspended in the air we breathe. Particulate pollution is made up of a variety of components, including acids (nitrates and sulfates), organic chemicals, metals, soil or dust particles, and allergens (pollen and mold spores). The size of the particles in directly linked to their potential for causing health problems. Particles that are 10 micrometers in diameter or smaller generally pass through the throat and nose and enter the lungs. EPA groups these into two types: "**inhalable coarse particles**," with diameters larger than 2.5 micrometers and smaller than 10 micrometers and "**fine particles**," with diameters that are 2.5 micrometers and smaller. How small is 2.5 micrometers? Think about a single hair from your head. The average human hair is about 70 micrometers in diameter – making it 30 times larger than the largest fine particle (Figure 6.8). Our respiratory systems are equipped to filter larger particles out of the air once it is inhaled. However, the lungs are vulnerable to both coarse particles (PM_{10}), and fine particles ($PM_{2.5}$). These can slip past the respiratory system's natural defenses and get deep into the lungs and some may even get into the bloodstream. Coarse particles come from road dust while fine particles come from combustion processes.

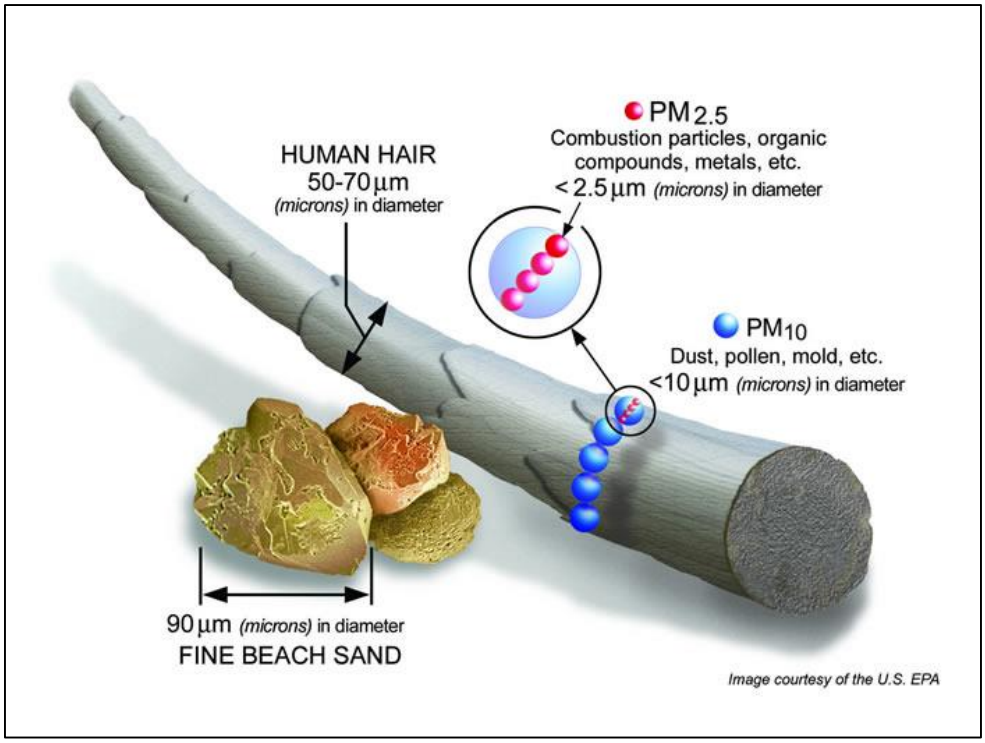


Figure 6.8: Graphic showing size comparison of particulate material (PM_{10} and $PM_{2.5}$) compared to fine beach sand and human hair. **Source**: US EPA http://www.epa.gov/air/particlepollution/basic.html

6.3.2 Volatile Organic Compounds

Volatile organic compounds (VOCs) are carbon-containing chemicals emitted as gases from natural and human-made sources. Natural sources of VOCs include plants, the largest source, and bacteria in the guts of termites and ruminant animals. These compounds are generally oxidized to carbon monoxide and carbon dioxide in the atmosphere. VOCs are of great concern because they are precursors for the formation of ozone, a secondary air pollutant.

A large number of synthetic organic chemicals such as benzene, toluene, formaldehyde, vinyl chloride, chloroform, and phenols are widely used as ingredients in countless household products. Paints, paint strippers, varnishes, many cleaning, disinfecting, cosmetic, degreasing, and hobby products all contain VOCs. Fuels are also made up of organic chemicals. All of these products can release organic compounds while you are using them, and, to some degree, when they are stored. The "new car smell" characteristic of new cars is from a complex mix of dozens of VOC. Also, concentrations of many VOCs are consistently higher indoors (up to ten times higher) than outdoors. They are often held responsible for sick building syndrome, an illness resulting from indoor pollution in which the specific cause is not identified

6.3.3 Smog

Smog is a mixture of air pollutants (sulfur dioxide, nitrogen oxides, ozone, and particulates) that often form over urban areas as a result of fossil fuel combustion. The term was coined from the terms "smoke" and "fog" referring to a brownish haze that pollutes the air, greatly reducing visibility and making it difficult for some people to breathe (Figure 6.9 and 6.10). There are two main types of smog: industrial and photochemical smog. **Industrial smog** is produced primarily by the burning of fossil fuels which produces carbon dioxide (from complete combustion), carbon monoxides (from partial

combustion), sulfur, and mercury. The sulfur reacts with other chemicals in the atmosphere producing several sulfur compounds including sulfur dioxide. These compounds along with particulate material make up industrial smog. **Photochemical smog** is formed when sunlight drives chemical reactions between primary pollutants from automobiles and normal atmospheric compounds. The product is a mix of over 100 different chemicals with the most abundant being ground-level ozone.

Figure 6.9: Smog over Almaty city, Kazakhstan. Photo by Igors Jefimovs. **Source:** Wikicommons https://commons.wikimedia.org/wiki/Category:Smog#/media/File:Smog_over_Almaty.jpg

Figure 6.10: Smog over Santiago in Chile. **Source**: German Wikipedia https://commons.wikimedia.org/wiki/Category:Smog#/media/File:Santiago30std.jpg

6.3.4 Toxic pollutants

Toxic air pollutants, also known as hazardous air pollutants, are those pollutants that are known or suspected to cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental effects. Examples of toxic air pollutants include benzene, which is found in gasoline; perchloroethylene, which is emitted from some dry cleaning facilities; methylene chloride, which is used as a solvent and paint stripper by a number of industries; and others such as dioxin, asbestos, toluene, and metals such as cadmium, mercury, chromium, and lead compounds.

Most air toxics originate from human-made sources, including mobile sources (e.g., cars, trucks, buses) and stationary sources (e.g., factories, refineries, power plants), as well as indoor sources (e.g., some building materials and cleaning solvents). Some air toxics are also released from natural sources such as volcanic eruptions and forest fires. Exposure to air toxics is mainly through breathing but some toxic air pollutants such as mercury can deposit onto soils or surface waters, where they are taken up by plants and ingested by animals and are eventually magnified up through the food chain. Like humans, animals may experience health problems if exposed to sufficiently high quantities of air toxics over time.

6.4 Indoor Air Pollution

In both developed and developing nations, indoor air pollution poses a greater health risk than outdoor air pollution. According to the World Health Organization (WHO) and other agencies such as the Environmental Protection Agency (EPA), indoor air generally contains higher concentrations of toxic pollutants than outdoor air. Additionally, people generally spend more time indoors than outdoors,

hence, the health effects from indoor air pollution in workplaces, schools, and homes are far greater than outdoor. Indoor pollution sources that release gases or particles into the air are the primary cause of indoor air quality problems in homes. Inadequate ventilation can increase indoor pollutant levels by not bringing in enough outdoor air to dilute emissions from indoor sources and by not carrying indoor air pollutants out of the home.

Outdoor air enters and leaves a building by infiltration, natural ventilation, and mechanical ventilation. In infiltration, outdoor air flows into the house through openings, joints, and cracks in walls, floors, and ceilings, and around windows and doors. In natural ventilation, air moves through opened windows and doors. Air movement associated with infiltration and natural ventilation is caused by air temperature differences between indoors and outdoors and by wind. Finally, there are a number of mechanical ventilation devices, from outdoor-vented fans that intermittently remove air from a single room, such as bathrooms and kitchen, to air handling systems that use fans and duct work to continuously remove indoor air and distribute filtered and conditioned outdoor air to strategic points throughout the house. The rate at which outdoor air replaces indoor air is described as the air exchange rate. When there is little infiltration, natural ventilation, or mechanical ventilation, the air exchange rate is low and pollutant levels can increase. High temperature and humidity levels can also increase concentrations of some pollutants.

There are many sources of indoor air pollution in any home (Figure 6.11). These include combustion sources such as oil, gas, kerosene, coal, wood, and tobacco products; building materials and furnishings as diverse as deteriorated, asbestos-containing insulation, wet or damp carpet, and cabinetry or furniture made of certain pressed wood products; products for household cleaning and maintenance, personal care, or hobbies; central heating and cooling systems and humidification devices. Pollutants causing indoor air pollution can also originate from outside sources such as radon, pesticides, and outdoor air pollution. Radon is a naturally occurring radioactive gas produced from the decay of uranium in rock. If a building/home is constructed in an area with uranium containing rock, the gas can seep through the foundations and accumulate in basements. Exposure to radon can cause lung cancer.

The relative importance of any single source depends on how much of a given pollutant it emits and how hazardous those emissions are. In some cases, factors such as how old the source is and whether it is properly maintained are significant. For example, an improperly adjusted gas stove can emit significantly more carbon monoxide than one that is properly adjusted. Some sources, such as building materials, furnishings, and household products like air fresheners, release pollutants more or less continuously. Other sources, related to activities carried out in the home, release pollutants intermittently. These include smoking, the use of unvented or malfunctioning stoves, furnaces, or space heaters, the use of solvents in cleaning and hobby activities, the use of paint strippers in redecorating activities, and the use of cleaning products and pesticides in house-keeping. High pollutant concentrations can remain in the air for long periods after some of these activities.

Risks from indoor air pollution differ between less industrialized and industrialized nations. Indoor pollution has a greater impact in less industrialized nations where many people use cheaper sources of fuel such as wood, charcoal, and crop waste among others for cooking and heating, often with little or no ventilation. The most significant indoor pollutant, therefore, is soot and carbon monoxide. In industrialized nations, the primary indoor air health risks are cigarette smoke and radon.

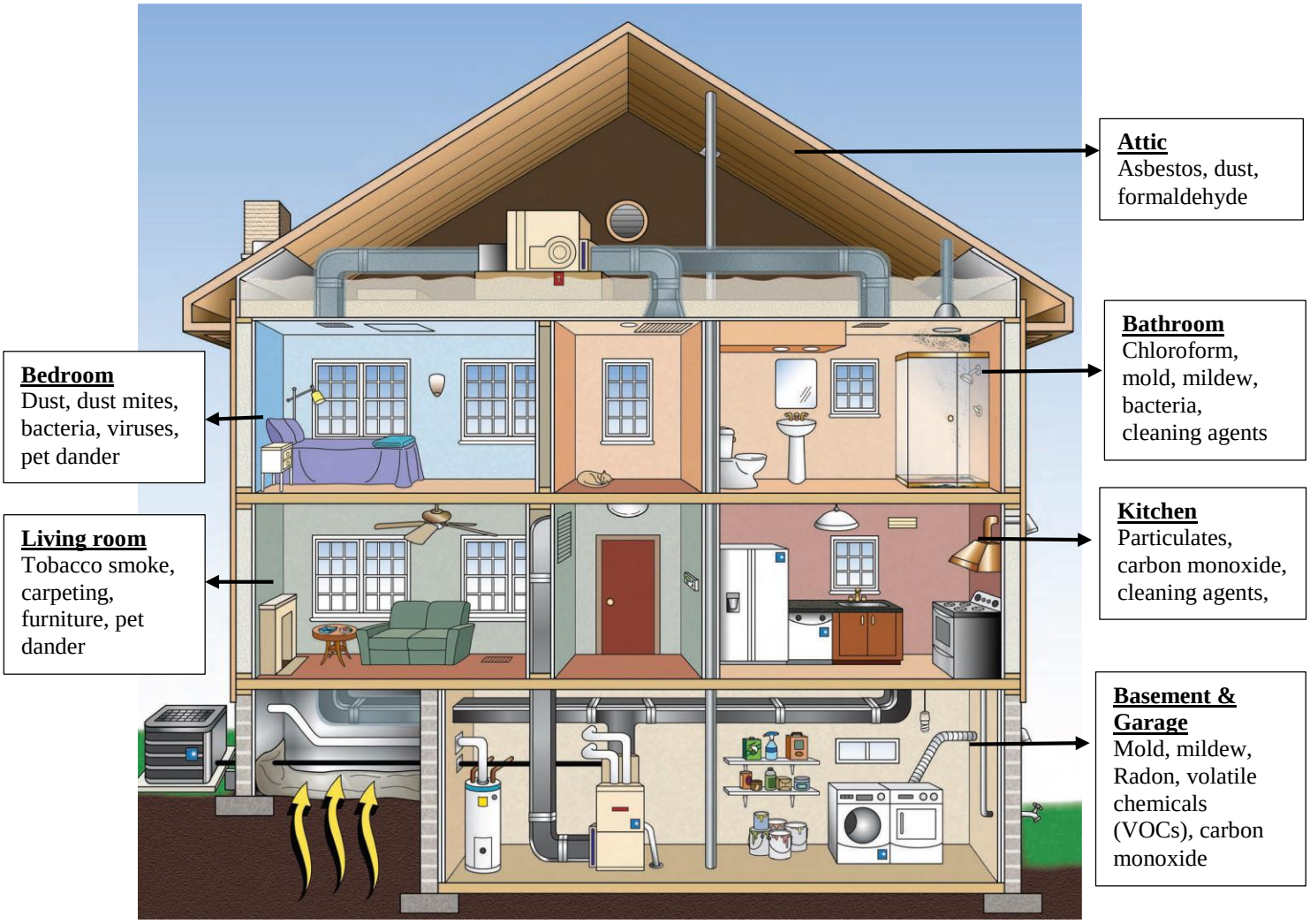


Figure 6.11: Sources of indoor air pollution. **Image source**: EPA http://www.epa.gov/iaq/pdfs/careforyourair.pdf

6.5 Effects of Air Pollution on Human Health

The World Health Organization (WHO) and other international agencies recognize air pollution as a major threat to human health. Numerous scientific studies have linked air pollution to a variety of health problems (Table 6.2) including: aggravation of respiratory and cardiovascular diseases; decreased lung function; increased frequency and severity of respiratory symptoms such as difficulty breathing and coughing; increased susceptibility to respiratory infections; effects on the nervous system, including the brain, such as IQ loss and impacts on learning, memory, and behavior; cancer; and premature death. Immediate effects of air pollution may show up after a single exposure or repeated exposures. Other health effects may show up either years after exposure has occurred or only after long or repeated periods of exposure.

Immediate effects of air pollution include irritation of the eyes, nose, and throat, headaches, dizziness, and fatigue. Such immediate effects are usually short-term and treatable. Sometimes the treatment is simply eliminating the person's exposure to the source of the pollution, if it can be

identified. Symptoms of some diseases, including asthma, hypersensitivity pneumonitis, and humidifier fever , may also show up soon after exposure to some indoor air pollutants.

Table 6.2: Sources and health effects of criteria pollutants

Pollutant	Sources	Health Effects
Ground-level Ozone (O_3)	Secondary pollutant typically formed by chemical reaction of volatile organic compounds (VOCs) and NO_x in the presence of sunlight.	Decreases lung function and causes respiratory symptoms, such as coughing and shortness of breath; aggravates asthma and other lung diseases leading to increased medication use, hospital admissions, emergency department (ED) visits, and premature mortality.
Particulate Matter (PM)	Emitted or formed through chemical reactions; fuel combustion (e.g., burning coal, wood, diesel); industrial processes; agriculture (plowing, field burning); and unpaved roads.	Short-term exposures can aggravate heart or lung diseases leading to respiratory symptoms, increased medication use, hospital admissions, ED visits, and premature mortality; long-term exposures can lead to the development of heart or lung disease and premature mortality.
Lead	Smelters (metal refineries) and other metal industries; combustion of leaded gasoline in piston engine aircraft; waste incinerators; and battery manufacturing.	Damages the developing nervous system, resulting in IQ loss and impacts on learning, memory, and behavior in children. Cardiovascular and renal effects in adults and early effects related to anemia.
Oxides of Nitrogen (NO_x)	Fuel combustion (e.g., electric utilities, industrial boilers, and vehicles) and wood burning.	Aggravate lung diseases leading to respiratory symptoms, hospital admissions, and ED visits; increased susceptibility to respiratory infection.
Carbon Monoxide (CO)	Fuel combustion (especially vehicles), industrial processes, fires, waste combustion, and residential wood burning.	Reduces the amount of oxygen reaching the body's organs and tissues; aggravates heart disease, resulting in chest pain and other symptoms leading to hospital admissions and ED visits.
Sulfur Dioxide (SO_2)	Fuel combustion (especially high-sulfur coal); electric utilities and industrial processes; and natural sources such as volcanoes.	Aggravates asthma and increased respiratory symptoms. Contributes to particle formation with associated health effects.

Source: www.epa.gov

The likelihood of immediate reactions to air pollutants depends on several factors. Age and preexisting medical conditions are two important influences. Some sensitive individuals appear to be at greater risk for air pollution-related health effects, for example, those with pre-existing heart and lung diseases (e.g., heart failure/ischemic heart disease, asthma, emphysema, and chronic bronchitis), diabetics, older adults, and children. In other cases, whether a person reacts to a pollutant depends on individual sensitivity, which varies tremendously from person to person. Some people can become sensitized to biological pollutants after repeated exposures, and it appears that some people can become sensitized to chemical pollutants as well.

6.6 Acid Rain

Pure rainfall is slightly acidic, pH 5.6, because water reacts with atmospheric carbon dioxide to produce weak carbonic acid. When higher than normal amounts of nitric and sulfuric acid occur in the atmosphere, the result is precipitation with a pH below 5.6 which is referred to as **acid rain**. Acid rain includes both wet deposition (rainfall, snow, fog) and dry deposition (particulates). Acid rain formation result from both natural sources, such as volcanoes and decaying vegetation, and man-made sources, primarily emissions of sulfur dioxide (SO_2) and nitrogen oxides (NO_x) resulting from fossil fuel combustion. In the United States, roughly $^2/_3$ of all SO_2 and ¼ of all NO_x come from electric power generation that relies on burning fossil fuels, like coal. Acid rain occurs when these gases react in the atmosphere with water, oxygen, and other chemicals to form various acidic compounds (Figure 6.12). The result is a mild solution of sulfuric acid and nitric acid. When sulfur dioxide and nitrogen oxides are released from power plants and other sources, prevailing winds blow these compounds across state and national borders, sometimes over hundreds of miles. Regions of greatest acidification tend to be downwind from heavily industrialized source areas of pollution.

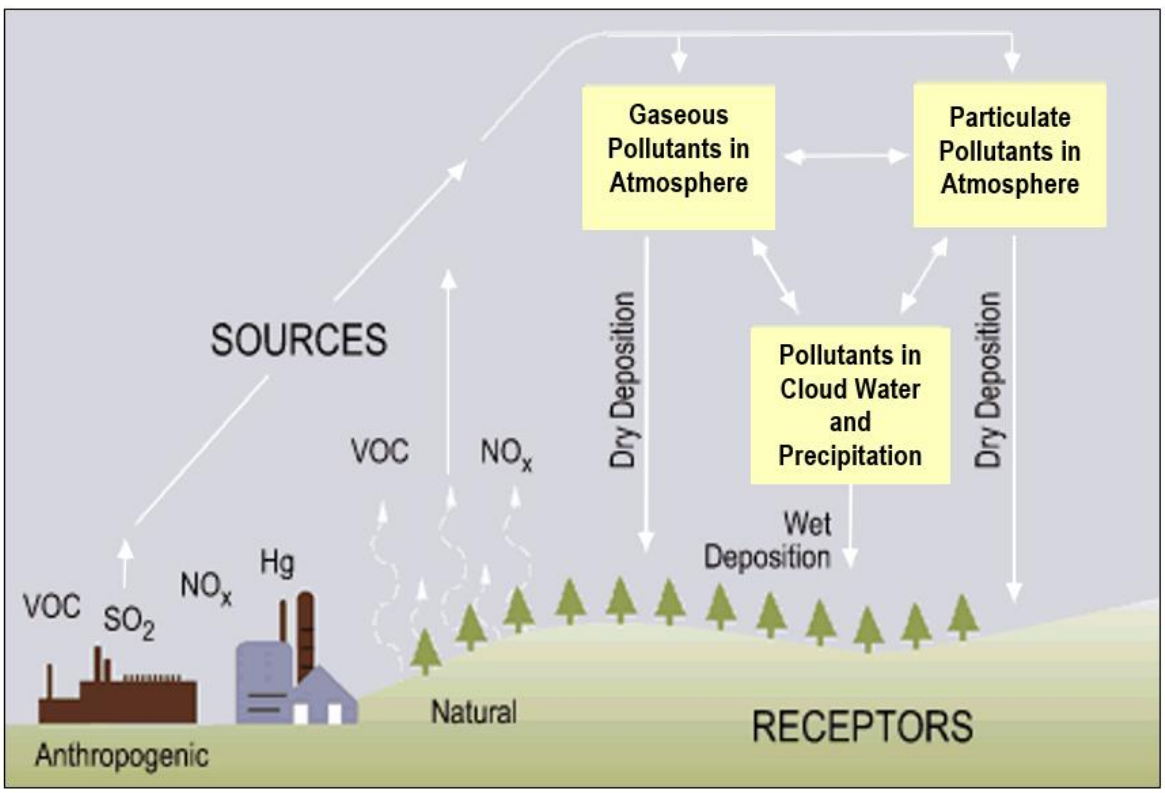


Figure 6.12: Formation of acid rain from both natural and anthropogenic pollutants
Source: US EPA http://www.epa.gov/acidrain/images/origins.gif

Acid rain is a serious environmental problem that is particularly damaging to lakes, streams, and forests and the plants and animals that live in these ecosystems, as well as to infrastructure. Some of the impacts include:

- Leaching of soil nutrients such as calcium, magnesium, and potassium out of the topsoil, altering soil chemistry and harming plants and soil organisms.
- Acid rain causes the release of substances that are toxic to trees and other plants, such as aluminum, into the soil. Scientists hypothesize that this combination of loss of soil nutrients and increase of

toxic aluminum may be one way that acid rain harms trees (Figure 6.13). Such substances also wash away in the runoff and are carried into streams, rivers, and lakes.

- Damage to automotive paints and other coatings. The reported damage typically occurs on horizontal surfaces and appears as irregularly shaped, permanently etched areas.
- Acidic particles contribute to the corrosion of metals (such as bronze) and the deterioration of paint and stone (such as marble and limestone). These effects significantly reduce the societal value of buildings, bridges, cultural objects (such as statues, monuments, and tombstones) (Figure 6.14).
- Sulfates and nitrates that form in the atmosphere contribute to visibility impairment, meaning we cannot see as far or as clearly through the air. Sulfate particles account for 50 to 70 percent of the visibility reduction in the eastern part of the U.S., affecting our enjoyment of national parks, such as the Shenandoah and the Great Smoky Mountains

Figure 6.13: Effects of acid rain on trees, Jizera Mountains, Czech Republic. Image from Wikimedia commons, Public Domain. https://commons.wikimedia.org/wiki/Category:Acid_rain#/media/File:Acid_rain_woods1.JPG

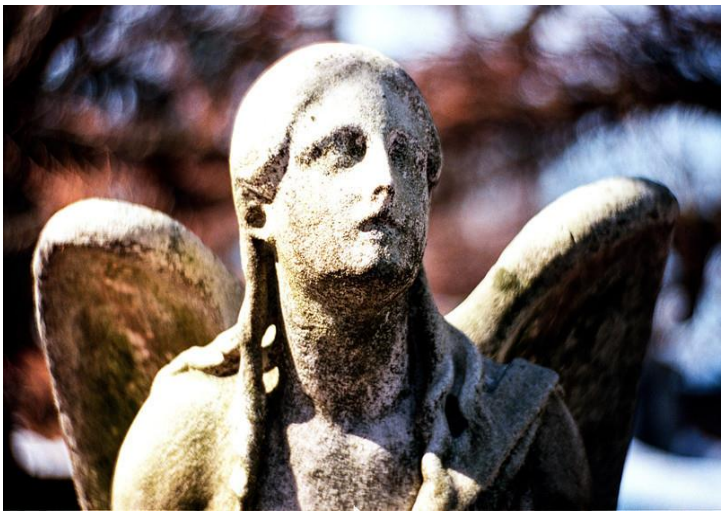


Figure 6.14: Effects of acid rain on a monument in Greenwood cemetery, Brooklyn New York. Photo by James P. Fischer. https://commons.wikimedia.org/wiki/Category:Acid_rain#/media/File:Charlotte_Canda_Memorial_(Angel).jpg

6.7 Air Pollution Legislation

In 1930, 63 people died and 1000 were sickened in Belgium when a phenomenon referred to as temperature inversion caused pollutants to be trapped near the surface, leading to a sudden spike in atmospheric sulfur levels. In October 1948, a thick cloud of air pollution formed above the industrial town of Donora, Pennsylvania. The cloud which lingered for five days, killed 20 people and caused sickness in 6,000 of the town's 14,000 people. In 1952, the infamous London fog in which acid aerosols trapped in the lower atmosphere killed 4000 people. Events like these alerted us to the dangers that air pollution poses to public health.

6.7.1 Clean Air Act

In the United States, several federal and state laws were passed, including the original Clean Air Act of 1963, which established funding for the study and cleanup of air pollution. But there was no comprehensive federal response to address air pollution until Congress passed a much stronger **Clean Air Act in 1970**. That same year Congress created the Environmental Protection Agency (EPA) and

gave it the primary role in carrying out the law. Since 1970, EPA has been responsible for a variety of Clean Air Act programs to reduce air pollution nationwide. The Clean Air Act is a federal law covering the entire country. However, states, tribes and local governments do a lot of the work to meet the Act's requirements. For example, representatives from these agencies work with companies to reduce air pollution. They also review and approve permit applications for industries or chemical processes.

6.7.2 EPA's Role

EPA's mission is basic health and environmental protection from air pollution for all Americans. To achieve this mission, EPA implements a variety of programs under the Clean Air Act that focus on:

- reducing outdoor, or ambient, concentrations of air pollutants that cause smog, haze, acid rain, and other problems;
- reducing emissions of toxic air pollutants that are known to, or are suspected of, causing cancer or other serious health effects; and
- phasing out production and use of chemicals that destroy stratospheric ozone.

Under the Clean Air Act, EPA sets limits on certain air pollutants, including setting limits on how much can be in the air anywhere in the United States. The Clean Air Act also gives EPA the authority to limit emissions of air pollutants coming from sources like chemical plants, utilities, and steel mills. Individual states or tribes may have stronger air pollution laws, but they may not have weaker pollution limits than those set by EPA. EPA must approve state, tribal, and local agency plans for reducing air pollution. If a plan does not meet the necessary requirements, EPA can issue sanctions against the state and, if necessary, take over enforcing the Clean Air Act in that area. EPA assists state, tribal, and local agencies by providing research, expert studies, engineering designs, and funding to support clean air progress. Since 1970, Congress and the EPA have provided several billion dollars to the states, local agencies, and tribal nations to accomplish this.

6.7.3 State and Local Governments' Role

It makes sense for state and local air pollution agencies to take the lead in carrying out the Clean Air Act. They are able to develop solutions for pollution problems that require special understanding of local industries, geography, housing, and travel patterns, as well as other factors. State, local, and tribal governments also monitor air quality, inspect facilities under their jurisdictions and enforce Clean Air Act regulations. States have to develop State Implementation Plans (SIPs) that outline how each state will control air pollution under the Clean Air Act. A SIP is a collection of the regulations, programs and policies that a state will use to clean up polluted areas. The states must involve the public and industries through hearings and opportunities to comment on the development of each state plan.

6.7.4 Outcomes of the Clean Air Act

For more than forty years, the Clean Air Act has cut pollution as the U.S. economy has grown. The combined emissions of the six criteria pollutants has continued to decrease while population, gross domestic product, energy consumption, and vehicle miles travelled have all continued to increase (Figure 6.14). The following is a summary of some of the accomplishments of the Clean Air Act:

- Clean Air Act programs have lowered levels of the six criteria pollutants - particulates, ozone, lead, carbon monoxide, nitrogen dioxide and sulfur dioxide - as well as numerous toxic pollutants.

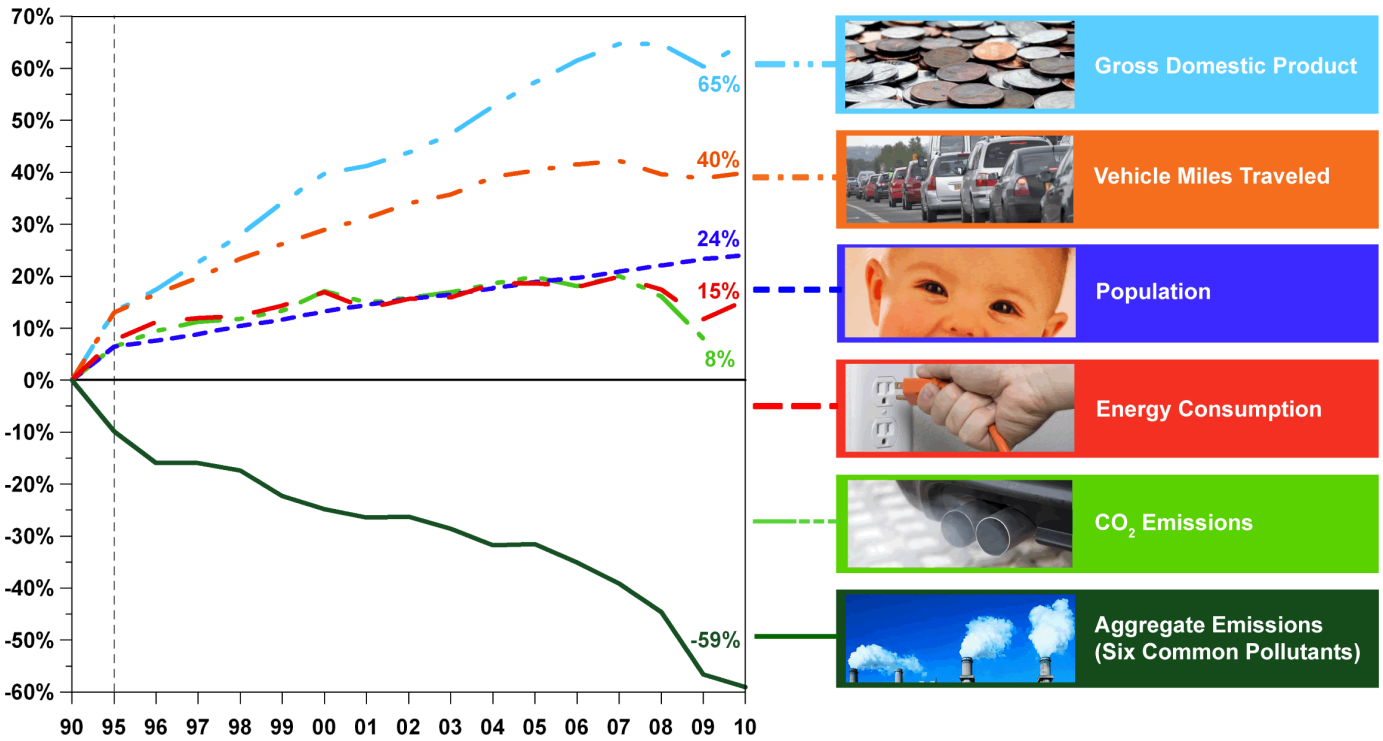


Figure 6.14: Showing a decrease in the combined emissions for the six criterial pollutants in the past two decades. Meanwhile, population, energy consumption, vehicle miles travelled, and gross domestic product have all increased. **Source**: US EPA

- From 1970 to 2012, aggregate national emissions of the six common pollutants alone dropped an average of 72 percent while gross domestic product grew by 219 percent (Figure 6.14). This progress reflects efforts by state, local and tribal governments; EPA; private sector companies; environmental groups and others.
- The emissions reductions have led to dramatic improvements in the quality of the air that we breathe.
- These air quality improvements have enabled many areas of the country to meet national air quality standards set to protect public health and the environment. For example, all of the 41 areas that had unhealthy levels of carbon monoxide in 1991 now have levels that meet the health-based national air quality standard. A key reason is that the motor vehicle fleet is much cleaner because of Clean Air Act emissions standards for new motor vehicles.
- Airborne lead pollution, a widespread health concern before EPA phased out lead in motor vehicle gasoline under Clean Air Act authority, now meets national air quality standards in most areas of the country.

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The Carbon Cycle

Carbon, just like all other elements, cycles through the environment and is constantly in the process of changing forms and locations. In this section, as in many other pieces of scientific literature, we will periodically refer to carbon by its chemical symbol, C. There is no new carbon in the world, rather, all carbon is continuously recycled from one form to another. All plants, animals (including humans!), fungi, bacteria, and archaea are made of mostly carbon-based molecules such as lipids, carbohydrates, proteins, and nucleic acids. Carbon is also prevalent in soils, rocks and sediments, water bodies (dissolved), and the atmosphere. These locations where carbon resides are known as pools or **reservoirs**, and the processes that move carbon from one location to another are called **fluxes**. Figure 7.1 shows a simplified version of the global carbon cycle.

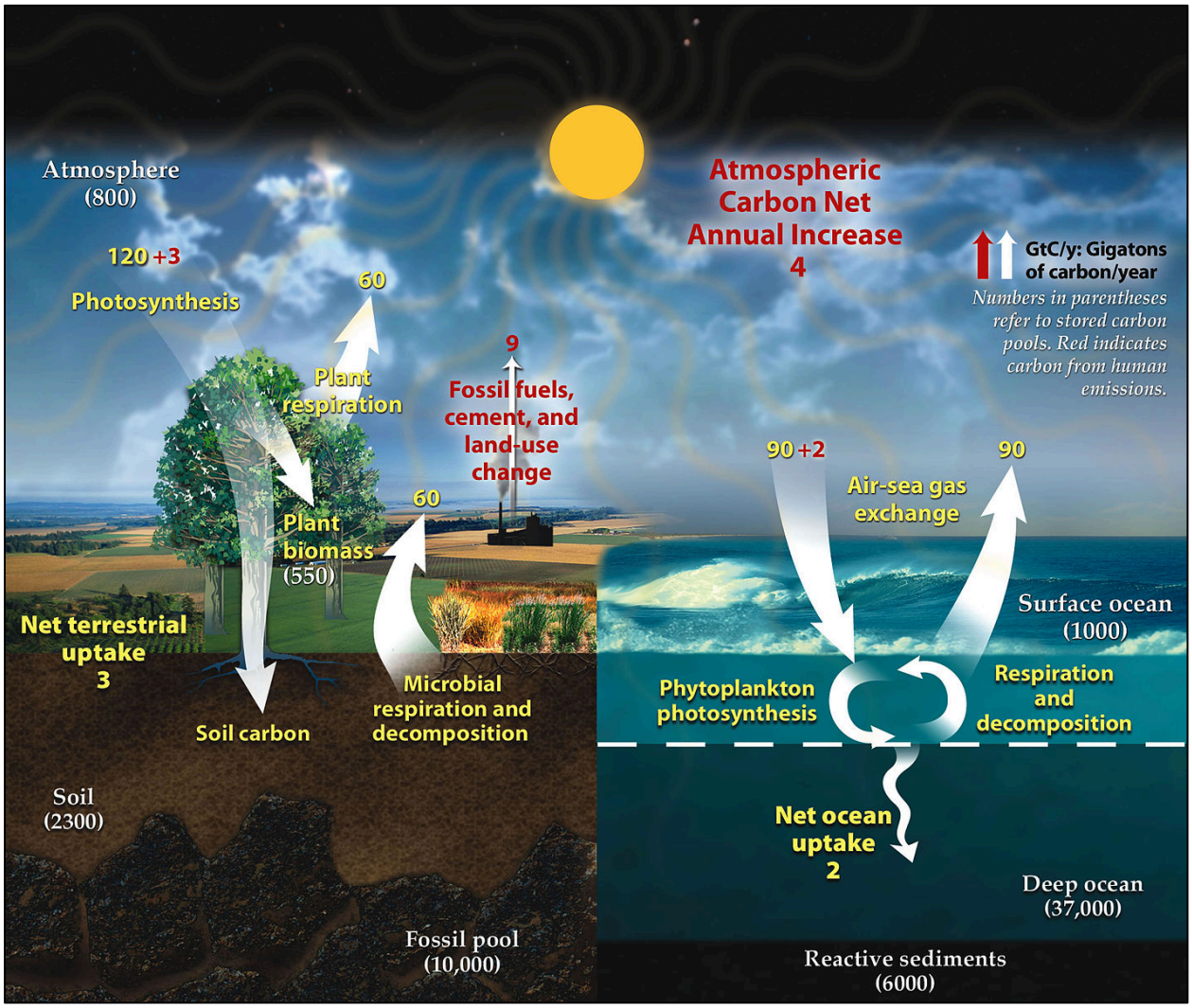

Figure 7.1: A simplified carbon cycle. Diagram adapted from U.S. DOE, Biological and Environmental Research Information System.

Some reservoirs hold on to carbon for only a short time. **Aerobic** (oxygen-using) organisms convert carbohydrates created by other organisms into **carbon dioxide** (CO_2) almost instantaneously, which they exhale into the atmosphere. When considering the flux of respiration, living organisms are the **source** of carbon, and the atmosphere is the **sink**. The carbon stays in the reservoir of living organisms for a relatively short time, depending on their life span, from hours and days to years and decades. In contrast, the **residence time** of carbon in the fossil pool is dramatically different. Fossil fuels form over a course of 300-400 million years, forming from ancient plants and animals that decomposed slowly under very specific, **anaerobic** (without oxygen) conditions in wetland environments. Their bodies were gradually transformed by the heat and pressure of the Earth's crust into the fossil fuels that we mine today to provide petroleum oil, natural gas, and coal (see more on this in chapter 4).

Reservoirs and fluxes of importance

The two largest reservoirs of carbon on Earth are the oceans, which cover the majority of Earth's surface, and the **lithosphere** (the mineral fraction of Earth: soils, rocks, and sediments). Each of these reservoirs holds more carbon than all of the other reservoirs combined. Much of the carbon stored in these reservoirs, especially deep in the lithosphere or in deep ocean environments, has an extremely long residence time, and does not actively participate in rapid fluxes. The notable exceptions here, of course, are fossil fuels, which are mined by humans and converted into gaseous forms of carbon through combustion.

Biomass, which is biological material derived from living, or recently living organisms, is a much smaller reservoir of carbon. The amount of carbon stored in all of the terrestrial vegetation (550 Gt C) (Gt = gigatonne = 10^9 metric tons = 10^{15} g) is just a fraction of that stored in the oceans (38,000 Gt C) and lithosphere (18,000 Gt C). All of the carbon that is currently stored in all of the vegetation on Earth got there through the process of **photosynthesis**. Plants and other photosynthetic organisms are called **primary producers**, because they "fix" atmospheric CO_2 into organic carbon, such as sugar, a form that is usable by animals and other organisms that need to consume their carbon molecules.

Photosynthetic organisms, such as plants, algae, and cyanobacteria, bring in CO_2 from the atmosphere and, using energy from the sun, convert CO_2 and water into glucose molecules (organic carbon). The products of photosynthesis are oxygen and glucose (Equation 7.1). These glucose molecules are simple sugars that **autotrophs** ("self-feeders") can "burn" for energy, or transform into other usable carbon molecules through the process of cellular respiration (described in the next paragraph), or to build plant biomass. Photosynthesis takes place in organelles called **chloroplasts**, shown in Figure 7.2. Photosynthesis accounts for 123 Gt of C per year that is removed from the atmosphere and stored in plant biomass. Such a massive amount of

photosynthesis occurs on Earth that no other single flux moves as much carbon in the same timeframe.

$$6CO_2 + 6H_2O + \text{solar energy} \rightarrow C_6H_{12}O_6 + 6O_2 \qquad \textbf{Eq. 7.1}$$

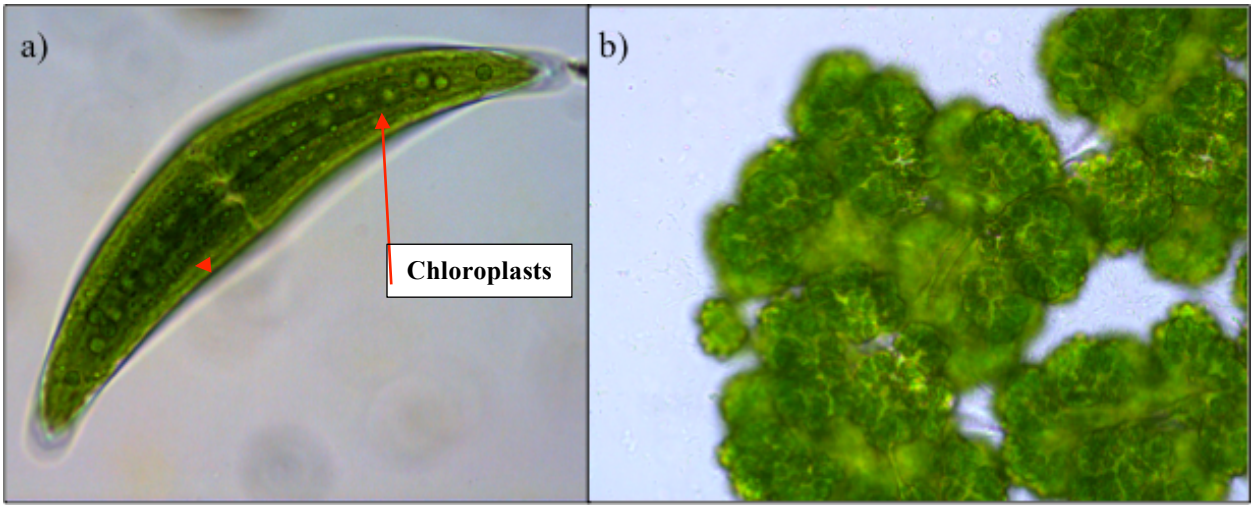

Figure 7.2: Chloroplasts visible in freshwater algae. Chloroplasts are green in color due to the chlorophyll *a* they contain, and are the site of photosynthesis. Chlorophyll *a* is the green pigment that allows plants, algae, and cyanobacteria to absorb the energy they need for photosynthesis from sunlight. a) *Closterium moniliferum* Ralfs, (Chlorophyta) green coccoid algae; b) *Botryococcus braunii* Kützing, (Chlorophyta) green coccoid algae with discoid chloroplasts. Image credit: K. Manoylov, Lake Sinclair, GA

Biomass in the carbon cycle, including plants and animals, is the reservoir of carbon that we are most likely most familiar with, and also the reservoir that is most readily available to us. We all participate in the flux of **consumption** of carbon when we eat food. All of our food is simply plant and/or animal biomass. Our body takes the carbon molecules contained in this biomass, and uses them, along with the oxygen we breathe in, for **cellular respiration** to create the adenosine triphosphate (ATP) we need for energy. The products of cellular respiration include the CO_2 we exhale, water, and energy that is stored in ATP (Equation 7.2). Our bodies also builds additional biomass out of the carbon molecules in this food, allowing us to create new cells for growth or replenishment. This is the only way we, and all other **heterotrophs** ("other-eaters"), can bring in the carbon we need to build and maintain our bodies. Remember, you are what you eat!

$$C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O + \text{energy} \qquad \textbf{Eq. 7.2}$$

Cellular respiration is an important flux in the carbon cycle, and one that contributes carbon to the atmosphere. Remember that animals and other heterotrophs complete cellular respiration using the carbon molecules that they bring in through their food. Plants and other photosynthetic autotrophs complete cellular respiration using the carbon molecules they formed from CO_2 through photosynthesis. Any carbon molecules that are left over after the organism has acquired sufficient energy through cellular respiration make up the biomass of the plant. As plants and animals die and decompose, their bodies are consumed by decomposer organisms such as fungi and bacteria. Through the flux of **decomposition**, some decaying biomass is converted into atmospheric carbon by the decomposers, while most of the biomass is buried into the soil, contributing to soil carbon. In oxygen-rich environments, decomposers rapidly consume dead and decaying biomass using the same process of aerobic cellular respiration described above. In oxygen-deficient environments, decomposers complete other metabolic pathways, and very slowly consume the organic matter. Some of the gases produced from anaerobic decomposition include **methane** (CH_4), **nitrous oxide** (N_2O), and the foul-smelling hydrogen sulfide (H_2S).

The biomass reservoir of the carbon cycle is also important to us as a source of energy. Through the flux of **combustion**, we convert the **potential energy** held in biomass into heat energy that we can use, and release carbon dioxide in the process. If you have ever burned logs on a campfire, or even burned food on the stove, you have completed this flux of biomass combustion. Of course, this happens naturally as well, the best example being natural forest fires caused by lightning strikes. The chemical reaction for combustion is identical to the chemical reaction for cellular respiration. The difference is that in cellular respiration, energy is released in a controlled fashion, and captured in ATP molecules. In combustion, all of this energy is released rapidly in the form of light and heat.

As all of the fluxes we've discussed so far involve the atmosphere, we have not yet discussed the flux that connects the atmosphere to the oceans. Carbon can enter the oceans through two primary fluxes: first through photosynthesis by algae or cyanobacteria (also called phytoplankton in Figure 7.1), and second through the chemical reaction of **ocean-atmosphere exchange**. The ocean, as with all surface water bodies, always contains some dissolved CO_2. This CO_2 is in **equilibrium** with the CO_2 in the air. Some atmospheric CO_2 is constantly dissolving into the ocean, while some dissolved CO_2 is constantly diffusing into the atmosphere. Under normal conditions, these two fluxes will be happening at equal rates. As you can see in Figure 7.1, however, this is no longer the case. In the section *Human impacts on the carbon cycle*, we will discuss why this is the case.

Activity: Better understanding the carbon cycle

To further review the carbon cycle, and better understand the human impacts on it, use this interactive graphic from Woods Hole laboratories: http://www.whoi.edu/feature/carboncycle/. As you will see, the information described in this text is only a small portion of the total carbon

cycle on Earth. Finally, complete Table 7.1 as a way to review the sink/source relationship within this cycle. See if you can correctly identify the source and sink of carbon for each of these important fluxes in the carbon cycle.

Table 7.1. Practice understanding the sink/source relationship with cycles

Carbon flux	Carbon source	Carbon sink
Cellular respiration	Carbohydrates in living organisms	CO_2 in the atmosphere
Photosynthesis		
Consumption		
Combustion		
Decomposition		
Ocean/atmosphere exchange		
Fossil fuel formation		

Human impacts on the carbon cycle

Humans, just like all other living organisms, have impacted the global carbon cycle since the dawn of our species. However, the magnitude of our impacts has changed dramatically throughout history. The **Industrial Revolution**, which occurred around the turn of the 19th century, began to make major changes in the use of resources around the world. Beginning in Britain, industrialization eventually affected the whole world. The development of coal-fueled steam power, and later transportation following the discovery of large oil deposits, had enormous influence on the economic and social structure of the world. As the world accelerated in the production and transportation of manufactured goods, the production and consumption of fossil fuels grew. As economic growth continued to increase, so did the production of carbon dioxide

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through fossil fuel combustion. See Figure 7.4 later in this text.

Some of the human impacts on the carbon cycle have been quantified for you in Figure 7.1. Changes to fluxes in the carbon cycle that humans are responsible for include: increased contribution of CO_2 and other **greenhouse gases** to the atmosphere through the combustion of fossil fuels and biomass; increased contribution of CO_2 to the atmosphere due to land-use changes; increased CO_2 dissolving into the ocean through ocean-atmosphere exchange; and increased terrestrial photosynthesis. The first two impacts, both contributing excess CO_2 to the atmosphere at a rate of 4 Gt of carbon per year have, by far, the largest impact on our planet. For this reason, this is the change that we will most often focus on throughout this section. The excess CO_2 in the atmosphere is responsible for the increased CO_2 dissolving into the ocean, which we will discuss later in this section. This is also, in part, responsible for the increased terrestrial photosynthesis that can be observed, as additional CO_2 is available to plants for photosynthesis. However, intensive agricultural and forestry practices also contribute to the change in this flux.

One characteristic example of a human impact on the carbon cycle is illustrated in Figure 7.3. Throughout most of our recent human history, people have been physically altering the landscape around them in order to have more control over their surroundings and increase their odds of survival. One way that people have done this is through agriculture. In order for most forms of agriculture to be successful, native vegetation is eliminated or minimized. Resources from this native vegetation, such as wood, may be used for combustion to provide heat, sanitation, or fuel for cooking. Combustion may also be used as an efficient way to clear the land and make way for crops or grazing lands for livestock. Often, settlements are formed around these newly fashioned agricultural fields, and the land is used in a similar fashion for many years in the future.

Let's identify the ways in which humans are impacting the carbon cycle in this scenario of agricultural establishment. You should be able to identify from the above paragraph that the flux of combustion will release CO_2 previously held in vegetation into the atmosphere. In addition, remember that the land that used to house native vegetation is now home to agricultural lands. In most controlled agricultural environments, there is less total vegetative biomass than there would be under natural conditions. This decreased biomass leads to lower total photosynthesis rates, thereby decreasing the amount of CO_2 that is removed from the atmosphere and turned into plant biomass. Also, open soil on the fields between crops, during the winter months, or as a result of overgrazing allows for the air to penetrate deep into the soil structure. This provides the environment necessary for enhanced aerobic respiration by soil microorganisms. This decreases soil carbon, which can lead to erosion and soil degradation, and also releases additional CO_2 to the atmosphere.

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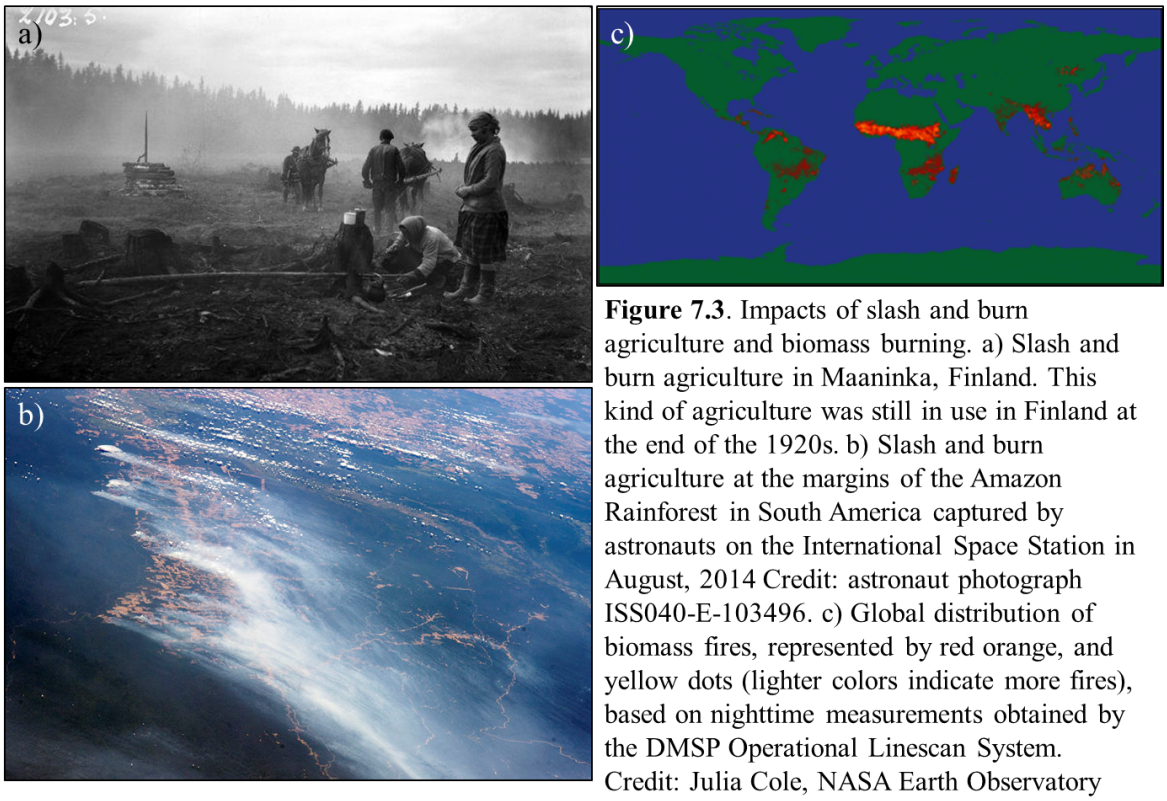

Figure 7.3. Impacts of slash and burn agriculture and biomass burning. a) Slash and burn agriculture in Maaninka, Finland. This kind of agriculture was still in use in Finland at the end of the 1920s. b) Slash and burn agriculture at the margins of the Amazon Rainforest in South America captured by astronauts on the International Space Station in August, 2014 Credit: astronaut photograph ISS040-E-103496. c) Global distribution of biomass fires, represented by red orange, and yellow dots (lighter colors indicate more fires), based on nighttime measurements obtained by the DMSP Operational Linescan System. Credit: Julia Cole, NASA Earth Observatory

As you learned in Chapter 5, biomass is an important form of energy to human civilization. Prior to the Industrial Revolution, this was essentially the only form of fuel to which most people on Earth had access. In many **less-industrialized countries**, combustion of biomass such as wood or animal dung is still the primary energy source that many citizens, particularly in rural areas, depend on for domestic use (heating, sanitation, and cooking) as it is inexpensive, relatively efficient, and readily available. Figure 7.3c shows the global distribution of biomass fires in the world. While the burning of biomass for domestic use contributes to some of these fires, it is the so-called **slash-and-burn agriculture** that makes up a larger contribution. Take a minute to compare the areas highlighted in Figure 7.3c to the countries of the world that are currently experiencing rapid population growth (Chapter 3). If you need a refresher, use the CIA World Factbook website to view current global population growth values by country: https://www.cia.gov/library/publications/the-world-factbook/rankorder/2002rank.html.

While biomass burning still has a significant impact on the global carbon cycle, human impacts on fluxes such as fossil fuel extraction and combustion continue to grow. For a review of the impacts of non-renewable energy sources such as fossil fuels, see Chapter 4. Burning of any fossil fuel (coal, natural gas, crude oil) moves carbon from a previously-sequestered state deep within the Earth's crust into carbon dioxide in the atmosphere. As countries become more industrialized, their reliance on and combustion of fossil fuels tends to increase. Look at the graph in Figure 7.4, which compares CO_2 emissions from fossil fuels of regions across the globe.

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How has the use and distribution of fossil fuels changed throughout the past 250 years?

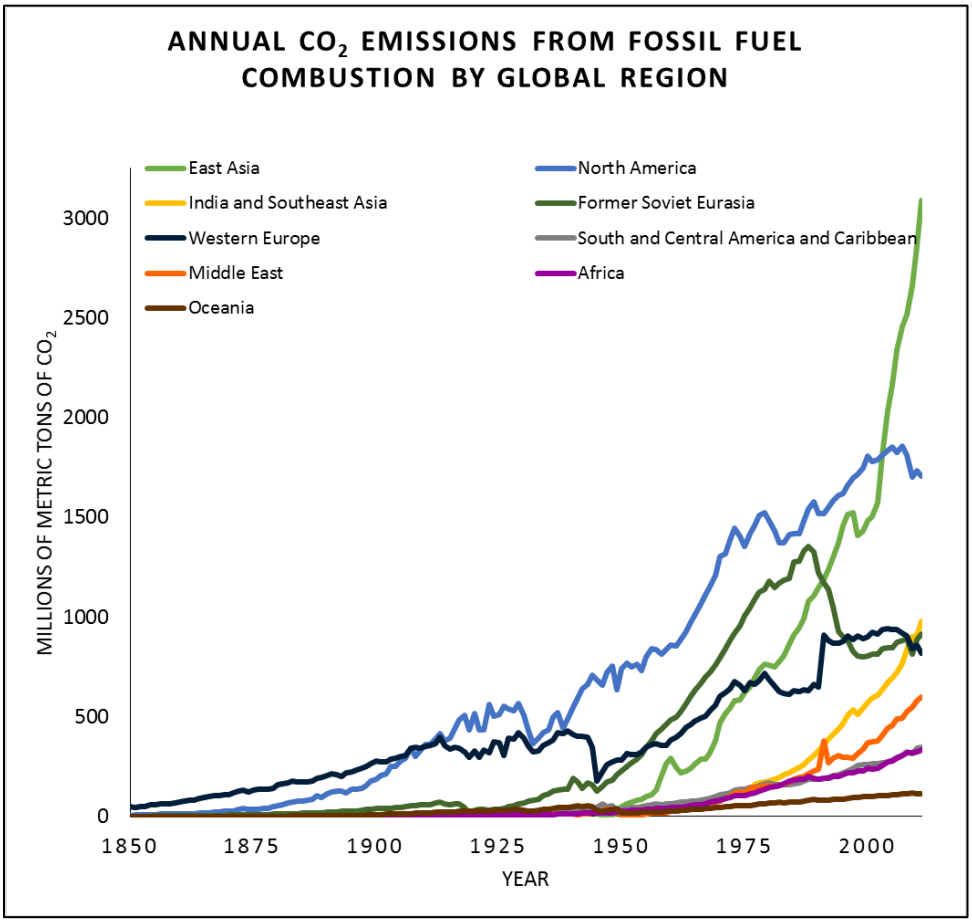

Figure 7.4. Total annual CO_2 emissions from fossil fuel combustion 1850-2011 by global region. Data from the Carbon Dioxide Information Analysis Center (CDIAC) http://cdiac.esd.ornl.gov/

The data shown in Figure 7.4 reveals much about the regions of the world it depicts. The effects of historic events such as the Great Depression of 1929-1939, World Wars, the fall of the Soviet Union in 1991, and the Kuwait oil fires of 1991 can be seen. Furthermore, between 1850 and 2011, different regions have gone in and out of the lead position as top producer of CO_2 from fossil fuel emissions. Population is one reason why fossil fuel use has changed throughout time. This is particularly apparent when comparing the data for Western Europe to that of India and Southeast Asia.

As countries industrialize, their relationship with agriculture also changes. **More-industrialized countries** rely very little on slash-and-burn agriculture. Their agricultural practices, however, are no less impactful on the environment. The growing population (Chapter 3) in many countries has required agriculture to become industrialized in order to meet demand. As a person living in the United States, **industrialized agriculture** probably produces the vast majority of the food you eat, including grains, fruits and vegetables, dairy and eggs, meats, and even fish. Industrialized agriculture can refer to a variety of practices, but has several main components: the use of motorized machinery; the use of chemicals such as fertilizers, pesticides, hormones, and/or antibiotics; and the intense and efficient production of one product across a large area of land.

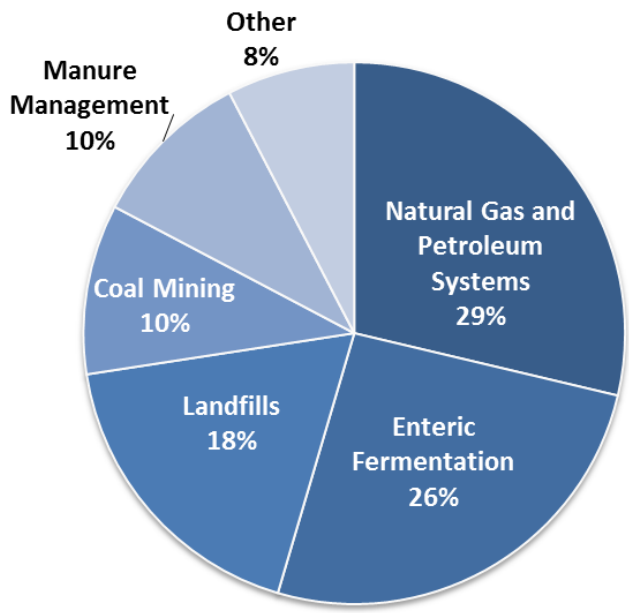

Figure 7.5. US methane emissions by source. 36% of the US methane production comes from agriculture: enteric fermentation (production of methane by anaerobic bacteria within the ruminant gut) and manure management. All emissions estimates from the Inventory of US Greenhouse Gas Emissions and Sinks: 1990-2013. US EPA.

One example of the impacts of industrialized agriculture is the production of methane (CH_4), a potent greenhouse gas. You will learn more about methane later in this section. As you saw earlier, methane is a common product of anaerobic metabolisms. The gut of **ruminant animals** (such as sheep, cattle, and goats) has evolved to allow the animals to digest the very tough carbon molecules, such as cellulose, in grass. They do this through symbiosis, or cooperation, with anaerobic bacteria who live in the gut tract. These anaerobic bacteria produce methane and other gases as a result of their metabolism when they break down molecules like cellulose. This is sometimes called enteric fermentation. The methane gas is excreted from the animal, and this contributes significantly to total methane emissions (Figure 7.5). A similar type of bacteria live in the fecal matter, or manure, of livestock. As the manure is handled or stored for future use, methane is also released to the environment.

The methane excretions of one cow or a few sheep would be miniscule and insignificant. If you were a small farmer with only enough livestock to feed your family, your contribution to total methane emissions would be close to zero. However, the demand for animal protein from meat, dairy, and eggs is very large in the United States. As of January 2015, the United States had a

total cattle inventory of 89.9 million animals, and in 2014, 25.5 billion pounds of beef was consumed in the United States (statistics: National Cattlemen's Beef Association). The impacts of enteric fermentation and manure management for almost 90 million animals are very significant, as seen in Figure 7.5. In both cases, carbon that was previously stored in biomass (cattle feed) is moved into the atmosphere, this time in the form of CH_4. This is another example of how humans have impacted the carbon cycle.

Previously in this chapter, you identified other ways the carbon cycle is impacted by human agriculture. Through industrialized agriculture, we must also account for the fossil fuels that are used. In order to deliver agricultural products to consumers, fossil fuels are used numerous times: deliveries of fertilizer, feed, and/or seed to farms; farm machinery; delivery of products to processers; food processing; delivery of foods to super markets; etc.

As animal products, especially meat, are expensive, the demand is typically greater in more-industrialized countries than it is in less-industrialized countries. This makes industrialized agriculture, and especially industrialized animal agriculture, one of the major contributors to greenhouse gas emissions in more-industrialized countries.

Knowledge check – answer these questions on your own to further explore the impacts of biomass and fossil fuel burning on the global carbon cycle.

1. Why is there a correlation between population growth rate and global distribution of biomass fires?
2. Do you think this correlation is more likely due to personal biomass fires for activities such as cooking, or due to slash-and-burn agriculture? Why?
3. Given any other knowledge you might have about the areas highlighted in in Figure 7.3c, what other environmental impacts may be occurring here besides carbon cycle alterations?
4. Compare the production of CO_2 emissions from fossil fuel combustion across world regions in 1900, 1950, and 2011 in Figure 7.4. What has accounted for these differences?
5. Has the total worldwide production of CO_2 from fossil fuels increased evenly relative to human population growth during the time period displayed in Figure 7.4? Why or why not?
6. What are the differences in contributions of greenhouse gas emissions from more-industrialized countries and less-industrialized countries? What are the similarities?

Resources

Carbon Dioxide Information Analysis Center http://cdiac.esd.ornl.gov/

NOAA Earth System Research Laboratory: Carbon Cycle Science
http://www.esrl.noaa.gov/research/themes/carbon/

Sass, Ronald. *Q2: What are the Causes of Global Climate Change?* OpenStax CNX. Sep 22, 2009 http://cnx.org/contents/5d263a29-7bd6-47bf-ad70-c233619bca33@3

USDA Climate Change and Agriculture in the United States: Effects and Adaptation http://www.usda.gov/oce/climate_change/effects_2012/effects_agriculture.htm

US EPA Overview of Greenhouse Gases: Methane http://epa.gov/climatechange/ghgemissions/gases/ch4.html

Woods Hole Oceanographic Institution: Carbon Around the Earth http://www.whoi.edu/feature/carboncycle/

Terms list

Aerobic

Anaerobic

Autotroph

Biomass

Carbon

Carbon dioxide

Cellular respiration

Chloroplast

Combustion

Consumption

Decomposition

Equilibrium

Flux

Greenhouse gas

Heterotroph

Industrial Revolution

Industrialized agriculture

Less-industrialized country

Lithosphere

Methane

More-industrialized country

Nitrous oxide

Ocean-atmosphere exchange

Photosynthesis

Potential energy

Primary producer

Reservoir

Residence time

Ruminant animal

Sink

Slash-and-burn agriculture

Source

The Science of Climate Change

What is causing global climate change?

Scientists have identified the source of our current global climate change as being the increased human-caused emissions of greenhouse gases such as carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O), since the industrial revolution. Greenhouse gases are defined as large (at least three atoms) gas molecules that participate in the **greenhouse effect**. While you already know about the "big three" greenhouse gases (CO_2, CH_4, and N_2O), it's important to realize that **water vapor** (H_2O) is also a greenhouse gas. While humans have little direct impact on water vapor concentrations in the atmosphere, is it still an essential component of the natural greenhouse effect that occurs in our atmosphere.

The Earth receives energy from the sun and in turn radiates energy back into space. When these two energies are equal, a stable temperature of the Earth is achieved. This temperature can be calculated from basic physics and is equal to about 18°C (0°F). This **thermal equilibrium temperature** is obviously much colder than that of the surface of the Earth. The actual average value of the Earth's surface temperature is about 15°C (59°F). The difference between these temperatures is due primarily to the natural greenhouse gas concentrations in the atmosphere, causing the greenhouse effect. If the Earth had no naturally occurring atmospheric greenhouse gases, the temperature at the surface of the Earth would equal the thermal equilibrium temperature. The influence of these greenhouse gases, mainly water and some CO_2, moderates the Earth's climate and makes life possible (Figure 7.6).

As **solar radiation** reaches the Earth's atmosphere, there are a variety of possibilities for its fate. Some solar radiation is reflected by the Earth and its atmosphere, and does not contribute to warming. Some passes through the atmosphere and reaches the surface of the Earth. When this solar radiation is absorbed by objects on Earth's surface, it is re-emitted as infrared radiation (heat) that escapes to space. However, some of this heat is intercepted in the atmosphere by greenhouse gases. These gases absorb and re-emit the radiation in all directions. This creates a warming impact on the Earth's surface Radiation can be bounced around from one greenhouse gas molecule to another, becoming trapped, and increasing its warming potential. For this reason, an increased greenhouse gas concentration causes an increase in the overall warming potential of the Earth's atmosphere.

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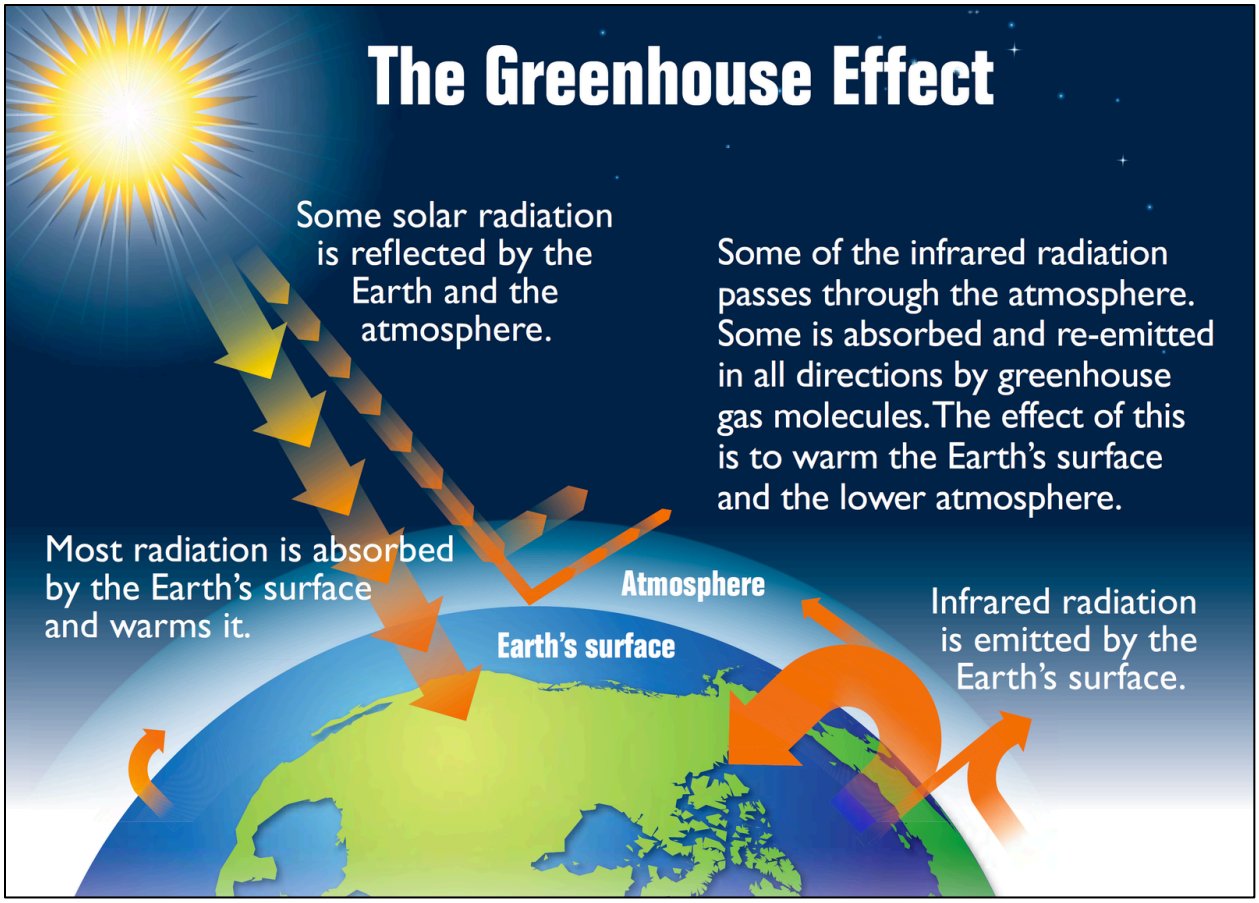

Figure 7.6. This diagram shows the Earth's greenhouse effect. The Earth absorbs some of the energy it receives from the sun and radiates the rest back toward space. However, certain gases in the atmosphere, called greenhouse gases, absorb some of the energy radiated from the Earth and trap it in the atmosphere. These gases essentially act as a blanket, making the Earth's surface warmer than it otherwise would be. While this greenhouse effect occurs naturally, making life as we know it possible, human activities in the past century have substantially increased the amount of greenhouse gases in the atmosphere, causing the atmosphere to trap more heat and leading to changes in the Earth's temperature. Credit: US EPA

On a geological time scale, the climate has changed many times in the past, even before the presence of humans. These changes occurred naturally because man had not yet evolved. A well-known example of past climate change is the occurrence of **ice ages**. Ice ages have occurred repeatedly throughout Earth's history, the most severe ice age of which scientists have reliable data occurred around 650,000 years ago. During this time, solid, glacial ice covered much of Canada, the northern United States, and northern Europe; the level of the ocean decreased 120 m, and the global average temperature decreased by 5°C.

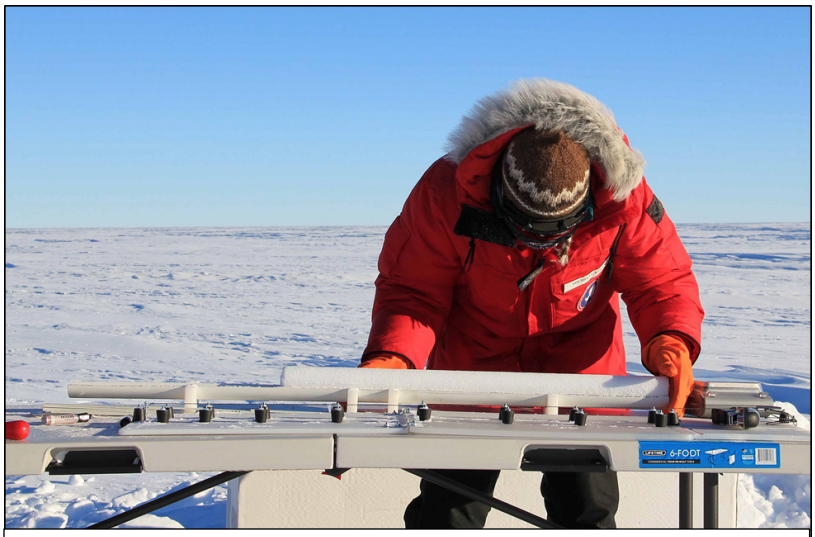

Figure 7.7. On Dec. 8, 2010, Michelle Koutnik, of the University of Copenhagen's Center for Ice and Climate, prepared a core of Antarctic ice to be wrapped and put into core tubes for transport back to labs at Brigham Young University in Utah. But first, Koutnik measured the core's length, diameter and weight. The traverse was the first of two field campaigns to study snow accumulation on the West Antarctic Ice Sheet and tie the information back to larger-scale data collected from satellites. Credit: NASA/Lora Koenig.

A geologic history of ice events is preserved in the ice sheets covering Antarctica and Greenland. This history has been uncovered over the past decades by scientists who have cored deeply into the ice and deciphered the temperature and atmospheric composition records stored in the ice. This process of obtaining **ice cores** is shown in Figure 7.7. The temperature at which the ice originally formed can be obtained from an interpretation of the measured ratio of the **stable isotopes** (see Chapter 1 supplement for a description of isotopes) of oxygen in the molecules of water forming the ice. The atmospheric gas composition is taken from air bubbles trapped in the ice at the time of formation. From these data, scientists have gathered a set of reliable data that track atmospheric temperature and gas concentrations that dates back 800,000 years. These data helped scientists come to the conclusion that the Earth's temperature and greenhouse gas concentrations are directly correlated to one another (Figure 7.8). During the ice age 650,000 years ago, the Earth was experiencing depressed temperature and atmospheric CO_2 concentrations below 200 **parts per million** (ppm). We can also see from these data, that CO_2 concentrations can be naturally elevated to as high as 300 ppm, correlating with increased temperatures.

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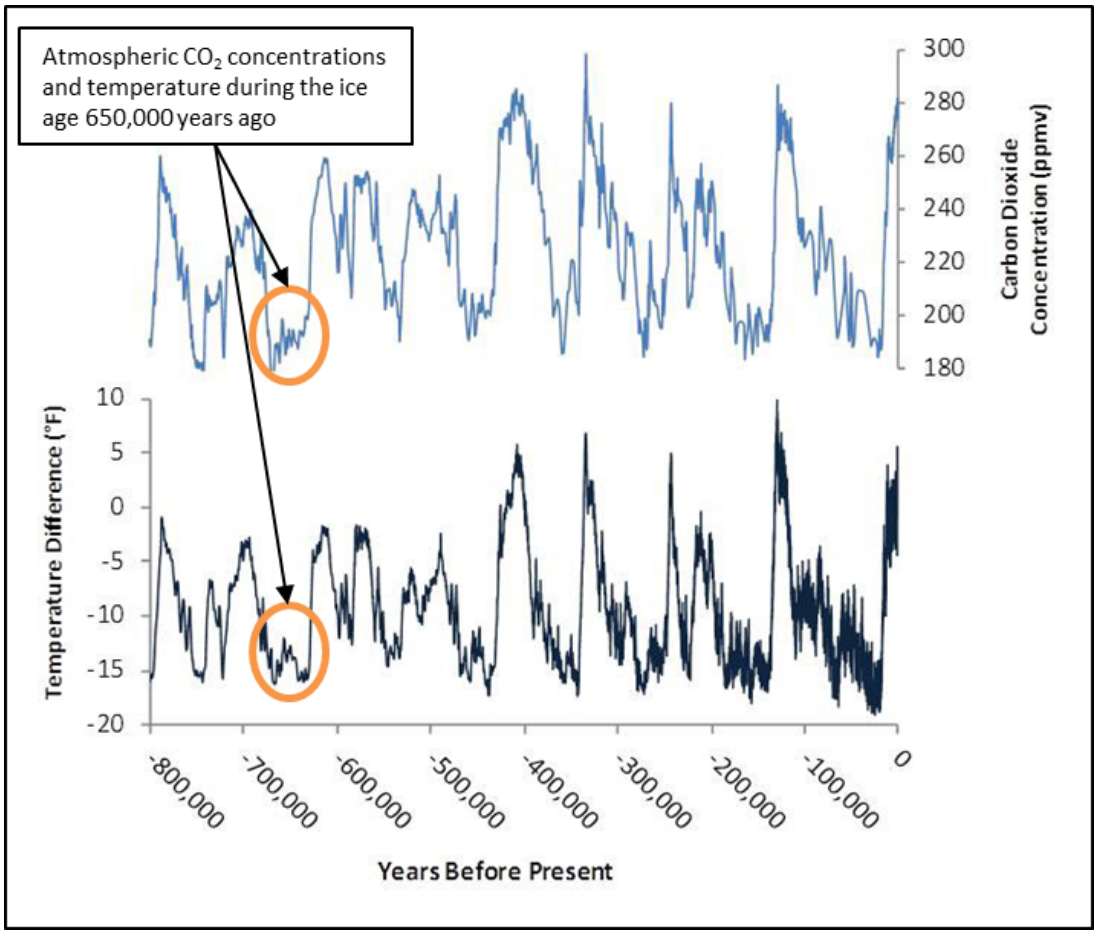

Figure 7.8. Estimates of the Earth's changing CO_2 concentration (top) and Antarctic temperature (bottom), based on analysis of ice core data extending back 800,000 years. Until the past century, natural factors caused atmospheric CO_2 concentrations to vary within a range of about 180 to 300 ppm. Warmer periods coincide with periods of relatively high CO_2 concentrations. NOTE: The past century's temperature changes and rapid CO_2 rise (to 400 ppm in 2015) are not shown here. Source: Based on data appearing in NRC (2010).

The 100,000 year major cycle of the ice ages and some variations within the cycles agree very well with predicted periodic relationships between the Earth's orbit around the sun, generally referred to as the **Milankovitch cycles**. Milankovitch cycles describe the very slight "wobbles" that occur in the Earth's tilt and path as it moves around the sun. The Earth is always slightly tilted on its axis with respect to the sun. The angle of this tilt, however, changes periodically, varying from about 22° to about 25°. A less severe tilt will cause milder summers and winters close to the poles, preventing full summer ice melt in the northern- and southernmost regions, and allowing for a buildup of ice from year to year.

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The path through which the Earth travels on its journey around the sun also changes from a more circular to a more elongated shape. Again, a round orbit will cause milder summers and winters close to the poles. These are very long term changes, and the results of the Milankovitch cycles can be observed in the changes in temperature and atmospheric CO_2 concentration shown in Figure 7.8. The climate change event that scientists are currently documenting is occurring much more rapidly than could be explained by Milankovitch cycles. Therefore, scientists agree that the cause of our currently changing climate is due to human impacts and not natural forces.

Greenhouse gases

We will be covering the four major categories of greenhouse gases that have been impacted by humans the most. See Table 7.2 for a numeric comparison of these greenhouse gases.

- Carbon dioxide, CO_2
- Methane, CH_4
- Nitrous oxide, N_2O
- Synthetic **fluorinated gases**, including **hydrofluorocarbons** (HFCs), **perfluorocarbons** (PFCs), and **sulfur hexafluoride** (SF_6)

Carbon dioxide (CO_2) is the greenhouse gas responsible for most of the human-caused climate change in our atmosphere. It has the highest concentration in the atmosphere of any of the greenhouse gases that we'll discuss here. Remember that CO_2 is a direct product of both combustion and cellular respiration, causing it to be produced in great quantities both naturally and anthropogenically. Any time biomass or fossil fuels are burned, CO_2 is released. Major anthropogenic sources include: electricity production from coal-fired and natural gas power plants, transportation, and industry (Chapter 4). To get an idea of how CO_2 concentration has changed over time, watch this video compiled by the National Oceanic and Atmospheric Administration (NOAA): http://www.esrl.noaa.gov/gmd/ccgg/trends/history.html. This video contains atmospheric CO_2 concentrations measured directly, dating back to 1958, as well as atmospheric CO_2 concentrations measured indirectly from ice core data, dating back to 800,000 BCE. By 1990, a quantity of over seven billion tons of carbon (equivalent to 26 billion tons of

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carbon dioxide when the weight of the oxygen atoms are also considered) was being emitted into the atmosphere every year, much of it from industrialized nations. Similar to the action of the naturally existing greenhouse gases, any additional greenhouse gases leads to an increase in the surface temperature of the Earth.

While CO_2 is produced by aerobic cellular respiration, gases such as CH_4 and N_2O are often the products of anaerobic metabolisms. Agriculture is a major contributor to CH_4 emissions, as you saw in section 7.1. In addition to anaerobic bacteria, methane is also a significant component of

natural gas, and is commonly emitted through the mining and use of natural gas and petroleum, in addition to coal mining. For a review of how fossil fuels are mined, see Chapter 4. Finally, **landfills** contribute significantly to CH_4 emissions, as the waste put into the landfill largely undergoes anaerobic decomposition as it is buried under many layers of trash and soil. Natural sources of CH_4 include swamps and wetlands, and volcanoes.

The vast majority of N_2O production by humans comes from agricultural land management. While some N_2O is naturally emitted to the atmosphere from soil as part of the nitrogen cycle, human changes in land management, largely due to agricultural practices, have greatly increased N_2O emissions. Some N_2O is also emitted from transportation and industry.

Due to their relatively high concentrations in the atmosphere compared to synthetic gases, CO_2, CH_4, and N_2O, are responsible for most of the human-caused global climate change over the past century. Figure 7.9 shows the increases in all three gases following the industrial revolution. Ice core data (Figure 7.8) shows us that the atmospheric CO_2 concentration never exceeded 300 ppm before the industrial revolution. As of early 2015, the current atmospheric CO_2 concentration is 400 ppm. Comparing Figure 7.9 to Figure 7.8, above, what is likely to happen to global temperature following this unprecedented rise in greenhouse gas levels?

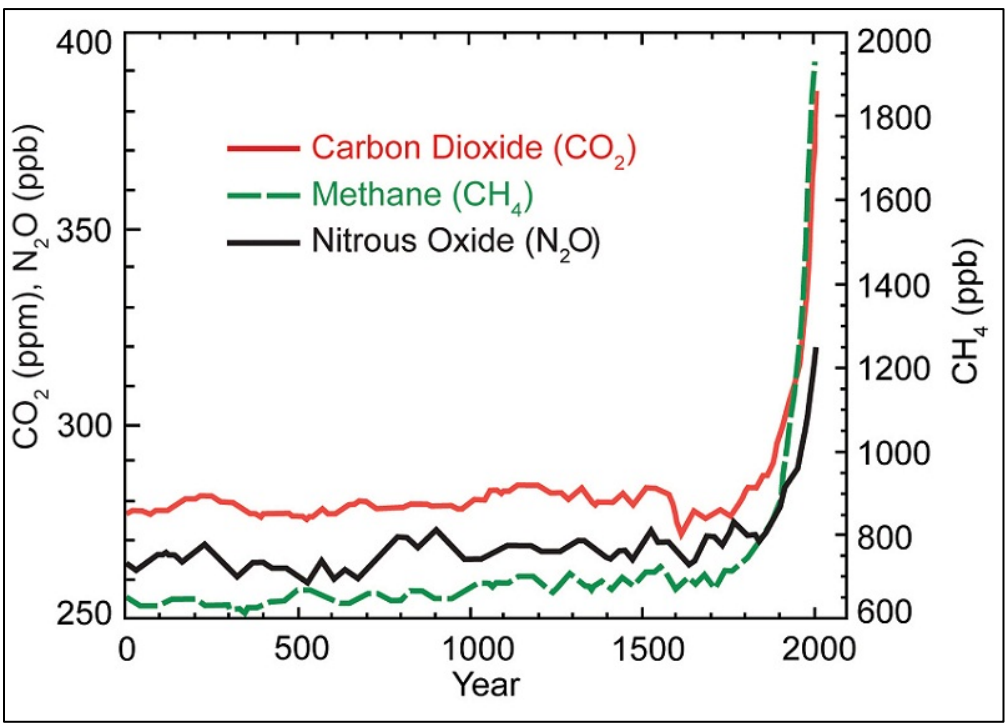

Figure 7.9. Increase in greenhouse gas concentrations in the atmosphere over the last 2,000 years. Increases in concentrations of these gases since 1750 are due to human activities in the industrial era. Concentration units are parts per million (ppm) or parts per billion (ppb), indicating the number of molecules of the greenhouse gas per million or billion molecules of air. Source: USGCRP (2009)

One class of greenhouse gas chemicals that has no natural sources is the fluorinated gases. These include HFCs, PFCs, and SF_6, among others. Because these are synthetic chemicals that are only created by humans, these gases were essentially non-existent before the industrial revolution. These synthetic gases are used for a wide variety of applications, from refrigerants to semiconductor manufacturing, and propellants to fire retardants. They tend to have a long lifetime in the atmosphere, as seen in Table 7.2. Some of these chemicals, as well as the older **chlorofluorocarbons** (CFCs), have been phased out by international environmental legislation under the Montreal Protocol (see Chapter 6). Due to their long lifespan, many of these now-banned CFCs remain in the atmosphere. Newer chemical replacements, such as HFCs, provide many of the same industrial applications, but unfortunately have their own environmental consequences.

Just as greenhouse gases differ in their sources and their residence time in the atmosphere, they also differ in their ability to produce the greenhouse effect. This is measured by the **global warming potential**, or GWP, of each greenhouse gas. The GWP of a greenhouse gas is based on its ability to absorb and scatter energy, as well as its lifetime in the atmosphere. Since CO_2 is the most prevalent greenhouse gas, all other greenhouse gases are measured relative to it. As the reference point, CO_2 always has a GWP of 1. Note the very high GWP values of the synthetic fluorinated gases in Table 7.2. This is largely due to their very long residence time in the atmosphere. Also note the higher GWP values for CH_4 and N_2O compared to CO_2. How does this impact the comparison of the environmental effects of agricultural practices in less-industrialized and more-industrialized countries that we completed in section 7.1?

Table 7.2. Comparison of common greenhouse gases in the atmosphere. Data from US EPA. For more information: http://epa.gov/climatechange/ghgemissions/gases.html

Greenhouse gas	Chemical formula or abbreviation	Lifetime in atmosphere	Global warming potential (100-year)
Carbon dioxide	CO_2	Variable	1
Methane	CH_4	12 years	28-36
Nitrous oxide	N_2O	114 years	298
Hydrofluorocarbons	Abbreviation: HFCs	1-270 years	12-14,800
Perfluorocarbons	Abbreviation: PFCs	2,600-50,000 years	7,390
Sulfur hexafluoride	SF_6	3,200 years	22,800

Other climate influencers

In addition to greenhouse gases, other manmade changes may be forcing climate change. Increases in near surface ozone from internal combustion engines, aerosols such as carbon black, mineral dust and aviation-induced exhaust are acting to raise the surface temperature. This

primarily occurs due to a decrease in the **albedo** of light-colored surfaces by the darker-colored carbon black, soot, dust, or particulate matter. As you know, it is more comfortable to wear a white shirt on a hot summer day than a black shirt. Why is this? Because the lighter-colored material bounces more solar radiation back toward space than the darker-colored material does, allowing it to stay cooler. The darker-colored material absorbs more solar radiation, increasing its temperature. Just as the white shirt has a higher albedo than the black shirt, light-colored objects in nature (such as snow) have a higher albedo than dark-colored objects (such as soot or dust). As humans increase the amount of carbon black, soot, dust, and particulates in the atmosphere, we decrease the albedo of light-colored surfaces, causing them to absorb more solar radiation and become warmer than they would without human influence. An example of this can be seen in the snow on Figure 7.10.

Figure 7.10. A photograph of the extreme dust deposition from the deserts of the Colorado Plateau onto the Colorado Rockies snowpack in 2009. Taken from the high point of the Senator Beck Basin in the San Juan Mountains, it captures the extent of the impact of darkening in which the snow albedo dropped to about 30%, more than doubling the absorption of sunlight. Credit: S. McKenzie Skiles, Snow Optics Laboratory, NASA/JPL

This section is modified from OpenStax material. Download for free at http://cnx.org/contents/5d263a29-7bd6-47bf-ad70-c233619bca33@3

Tools scientists use to study climate change

Scientists must gather together all data that is available to them in order to make meaningful conclusions and predictions regarding climate change. When they bring these data together, the prediction they make is in the form of a scientific **model**. A model is a projection of what might happen in the future based on knowledge of current and past events. The models that are published to predict climate change must pass a rigorous scientific peer-review process, and often require the combination of findings of hundreds of experiments. These large-scale models are typically beyond the capacity of a standard desktop computer, and must be run by large super-computers housed at research universities or government laboratories. For more information on how scientists build and test models, follow the link below and click on the slideshow animation, paying special attention to the sections "Model Overview" and "Testing Models." http://www.epa.gov/climatechange/science/future.html

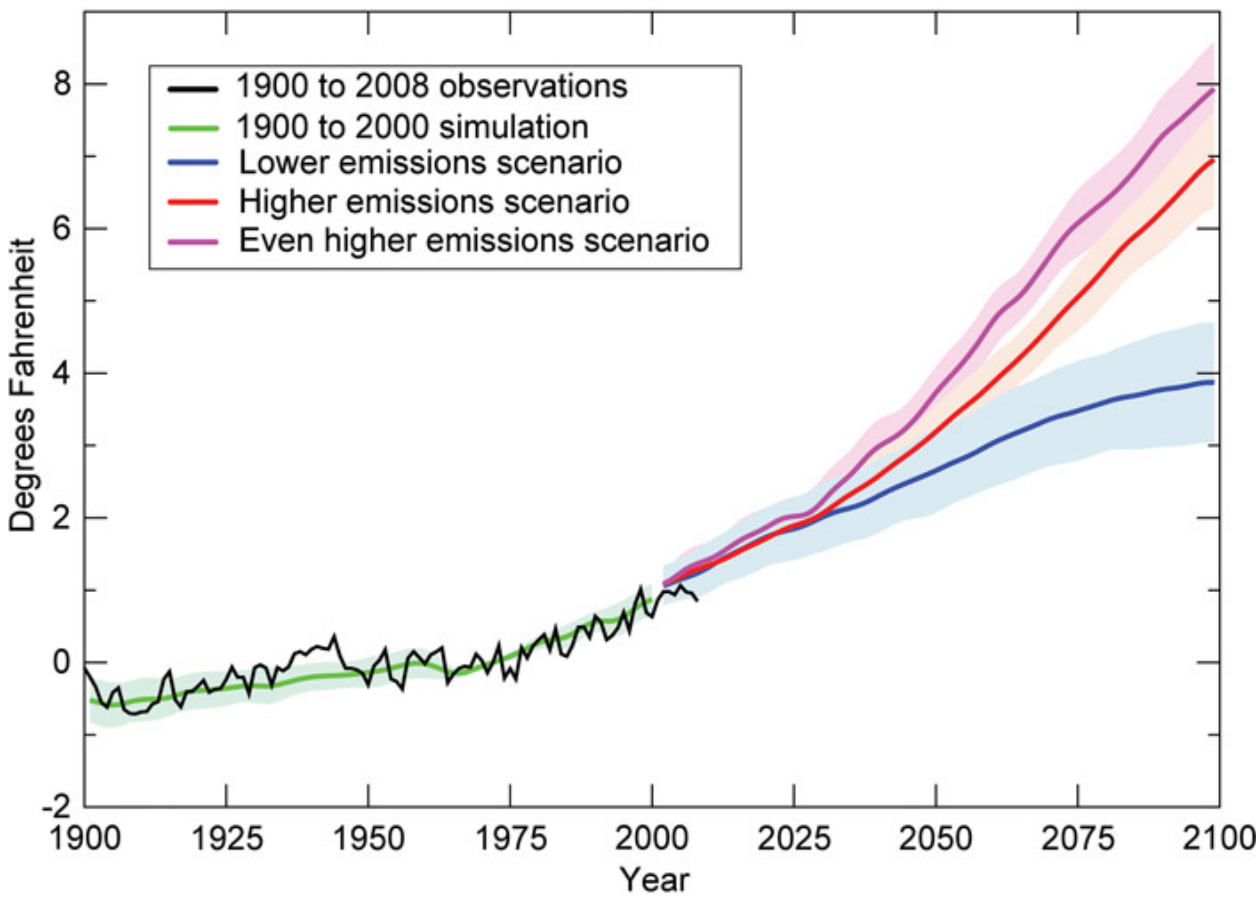

Figure 7.11. Observed and projected changes in global average temperature under three no-policy emissions scenarios. The shaded areas show the likely ranges while the lines show the central projections from a set of climate models. A wider range of model types shows outcomes from 2 to 11.5°F. Changes are relative to the 1960-1979 average. Source: USGCRP 2009

Figure 7.11 is one example of a scientific model of the impacts of climate change. Within this figure, we see the directly-measured observations of global average temperature (black line). We also see models of four different scenarios: 1900 to 2000 simulation using actual greenhouse emissions (green line), and 2000 to 2100 simulation using very high (purple line), high (red line), and low (blue line) greenhouse gas emissions scenarios.

Why did scientists make a model of the data from 1900 to 2000 in Figure 7.11 when they could just look up the data in published literature? This is an important component of model testing. In order to ensure accuracy of the model, you should not only be able to predict future events, but past events as well. Scientists use this as a way to "calibrate" their model. Since this model reliably predicts past events, chances are good that it will reliably predict future events as well.

Another example of a climate model is shown in Figure 7.12, this time comparing climate projections with and without the influences of humans on greenhouse gas emissions. This large model is a combination of the work of many different models, in order to achieve the most accurate outcome.

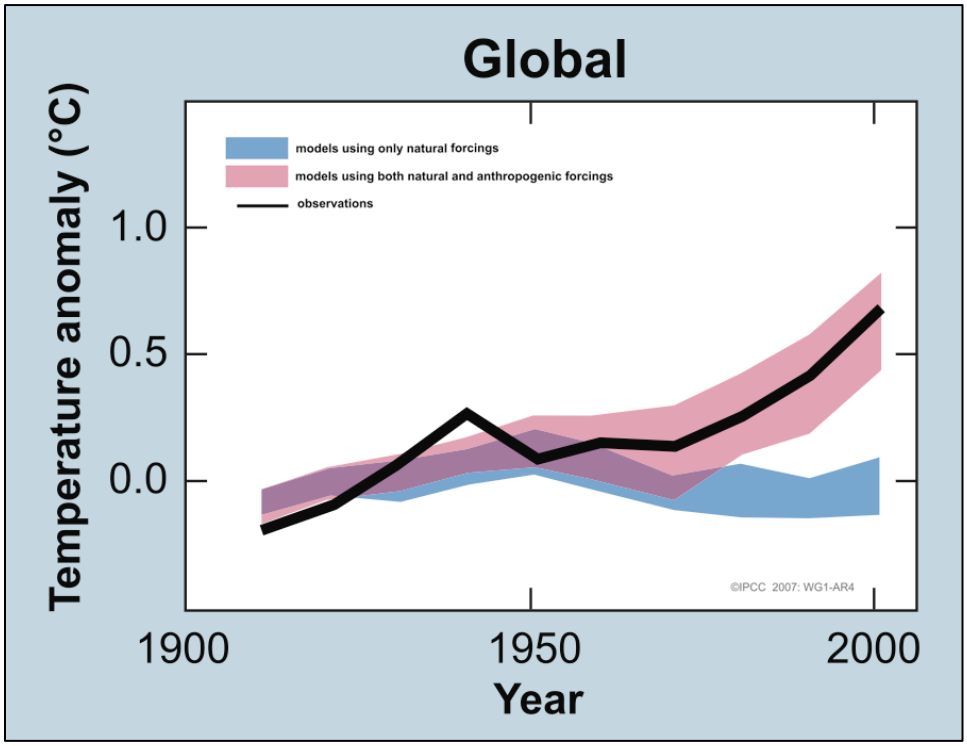

Figure 7.12. Comparison between observed average global temperatures and corresponding modeled temperatures with and without anthropogenic climate forces (IPCC, Working group 1, 2007).

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In Figure 7.12, the decadal averages of observations are shown for the period 1906 to 2005 (black line). All temperatures are plotted relative to zero being defined as the corresponding average for the period from 1901 to 1950. The blue shaded band shows the 5% to 95% **confidence interval** for 19 simulations from 5 climate models using only the natural forcing effects due to solar activity and volcanoes. The red shaded band shows the 5% to 95% confidence interval for 58 different simulations from 14 climate models using both natural and anthropogenic forces. These different simulations and the different models are used by different scientific groups and represent different treatments of the Earth's systems. It is thus quite encouraging that model calculations are in major agreement with the assumption that global temperature change from 1900 to 2000 is due to both natural and anthropogenic effects, with anthropogenic effects being the major causes in its recent dramatic increase.

You will see more examples of climate models as you make your way into the final section of the climate change chapter: consequences of climate change.

This section is modified from OpenStax material. Download for free at http://cnx.org/contents/5d263a29-7bd6-47bf-ad70-c233619bca33@3

Resources

NASA Global Climate Change: Vital Signs of the Planet http://climate.nasa.gov/

NOAA Paleoclimatology: Astronomical Theory of Climate Change http://www.ncdc.noaa.gov/paleo/milankovitch.html

Sass, Ronald. *Q2: What are the Causes of Global Climate Change?* OpenStax CNX. Sep 22, 2009 http://cnx.org/contents/5d263a29-7bd6-47bf-ad70-c233619bca33@3

University of San Diego Virtual Museum: Climate Change http://earthguide.ucsd.edu/virtualmuseum/climatechange2/01_1.shtml

US EPA: Future Climate Change http://www.epa.gov/climatechange/science/future.html

US EPA: Overview of Greenhouse Gases http://epa.gov/climatechange/ghgemissions/gases.html

Terms list

Albedo

Chlorofluorocarbon

Confidence interval

Fluorinated gases

Global warming potential

Greenhouse effect

Hydrofluorocarbon

Ice age

Ice core

Landfill

Milankovitch cycles

Model

Parts per million

Perfluorocarbon

Solar radiation

Stable isotopes

Sulfur hexafluoride

Thermal equilibrium temperature

Water vapor

Consequences of Climate Change

As part of your assigned reading for this section, read the article "The Coming Storm" by Don Belt published in *National Geographic*:
http://ngm.nationalgeographic.com/print/2011/05/bangladesh/belt-text

In this section, we will discuss the effects of climate change, both those that have already been observed, as well as future predictions based on scientific climate models (see section 7.2 for a discussion of scientific models). Here, the differences between the terms **global warming** and **climate change** become apparent. Global warming refers to the increase in the average temperature of the Earth's atmosphere due to elevated greenhouse gas concentrations, heightening the greenhouse effect. We have already observed this increase occurring, as you saw in Figure 7.12 from section 7.2. We have also seen, and expect to continue to see, other changes occurring in the **climate** of the Earth. Furthermore, changes have been observed, and we expect to continue to observe, changes in other chemical, physical, and biological aspects of the Earth's environment. We will only discuss some of the consequences of climate change in this section, including changes in temperature, precipitation, ocean level, and ocean acidity. There are many more changes that have been seen, and are projected to continue in the future. These include: changes in the amount and distribution of ice and snow, changes in seasonality, ecosystem shift, and habitat changes of plant and animal populations, in addition to others. For more information about these consequence of climate change, visit this site:
http://www.epa.gov/climatechange/science/indicators/index.html.

Temperature and precipitation

Temperature and **precipitation** are the two most direct impacts on the Earth's climate due to climate change. By now, you should already understand why an increase in greenhouse gas levels in the atmosphere causes an increase in temperature. But why does it also impact precipitation patterns? As you already know, water vapor is an important component of the Earth's atmosphere (see Chapter 6). As the air in the troposphere warms and cools, the amount of water vapor that it holds changes dramatically. Here in Georgia, we have very hot and humid summers. The high summer humidity in this region is possible due to the increased capability warm air has to hold water vapor. Simply put, warmer air can hold more water than cooler air. As air cools, its ability to hold water vapor decreases, and any excess water will leave the air as liquid water. A great example of this is the formation of dew on surfaces overnight. During the day, the temperature is warmer than it is at night, and the air has a relatively high holding capacity for water vapor. When the sun sets, the air cools, decreasing its capacity to hold water vapor. That extra water must go somewhere, and it does that by accumulating on surfaces. Similarly, when warm and cool air fronts collide, the chances for rain and thunderstorms increase. Furthermore, an increase in temperature enhances evaporation occurring at the Earth's

surface. This increased evaporation leads to greater concentrations of water vapor in the atmosphere which can lead to increased precipitation.

The change in temperature that we have already seen in the Earth's average atmospheric temperature is relatively small (about 0.6 °C, according to Figure 7.12 from section 7.2). However, as with many of the aspects of climate change, the potential for greater changes increases dramatically as time progresses in the future. This can be seen in Figure 7.13, which displays a model of the predicted temperature increase. Notice that these changes occur relatively rapidly, and are not uniform across the globe. What might be some of the reasons for this?

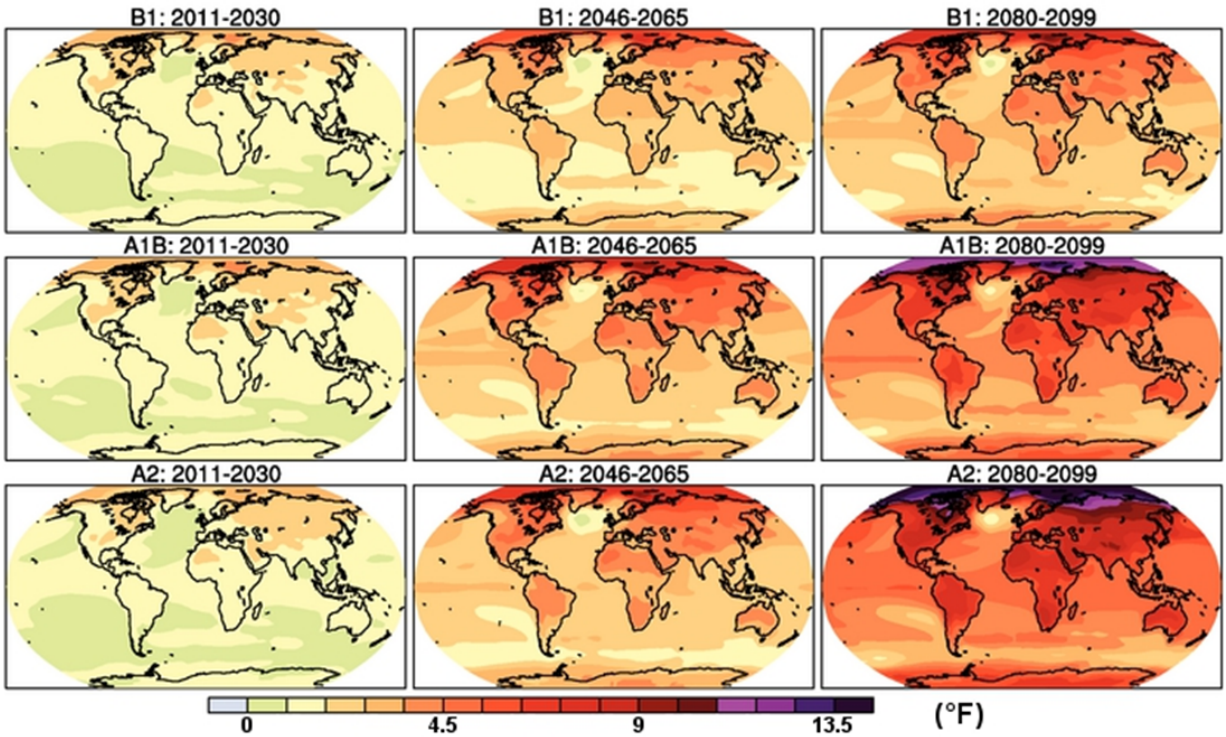


Figure 7.13. Projected changes in global average temperatures under three emissions scenarios (rows) for three different time periods (columns). Changes in temperatures are relative to 1961-1990 averages. The scenarios come from the IPCC Special Report on Emissions Scenarios: B1 is a low emissions scenario, A1B is a medium-high emissions scenario, and A2 is a high emissions scenario. Source: IPCC Working Group I: The Physical Science Basis, 2007.

Changes in precipitation occur due to a variety of factors, including changes in atmospheric water vapor content due to changing temperature, as discussed above. Also at play is the heightened **evaporation** rate of water on Earth's surface under warmer temperatures. More evaporation leads to more precipitation. Finally, shifts in wind patterns impact the distribution of precipitation events. As you can see in Figure 7.14, there are some areas of the globe that are expected to have an increase in precipitation, while others are expected to have a dramatic

decrease. Some major population centers projected to have a moderate to severe precipitation increase include (population estimates of the metropolitan area given in parentheses): New York, United States (20.1 million); Bogotá, Colombia (12.1 m.); and Manila, Philippines (11.9 m.). What sort of challenges might these cities face in the future as they deal with this change in their climate?

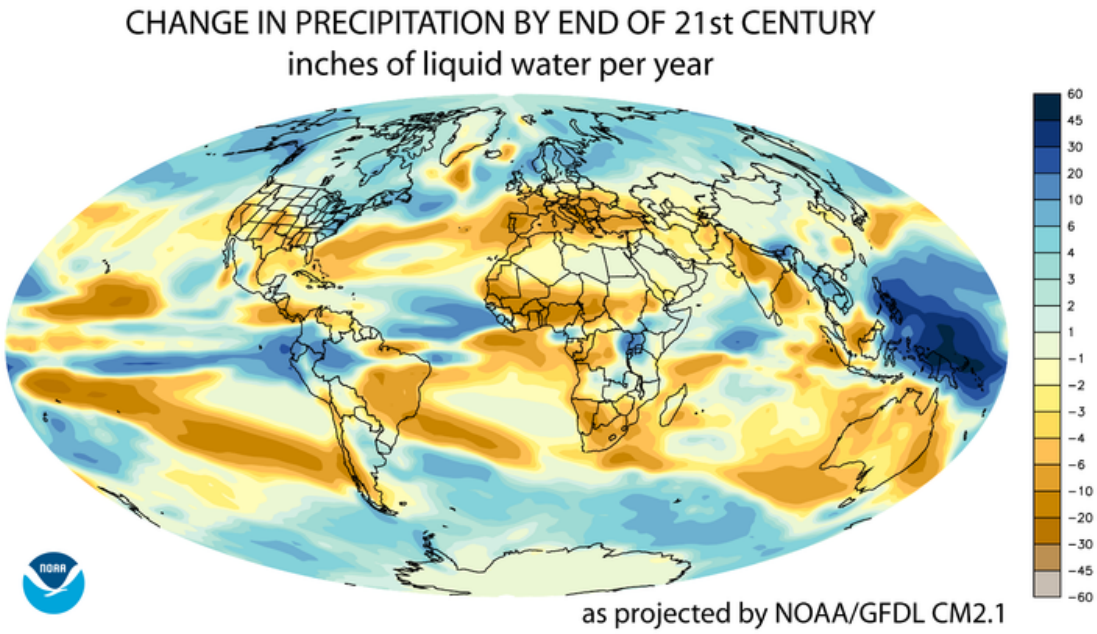


Figure 7.14. Change in annual average precipitation projected by the NOAA Geophysical Fluid Dynamics Laboratory (GFDL) by the GFDL CM2.1 model for the 21st century based on the A1B emissions scenario (see Figure 7.13). The plotted precipitation differences were computed as the difference between the 2081 to 2100 20-year averages minus the 1951 to 2000 50-year average. Blue areas project increases in precipitation; brown areas project decreases.

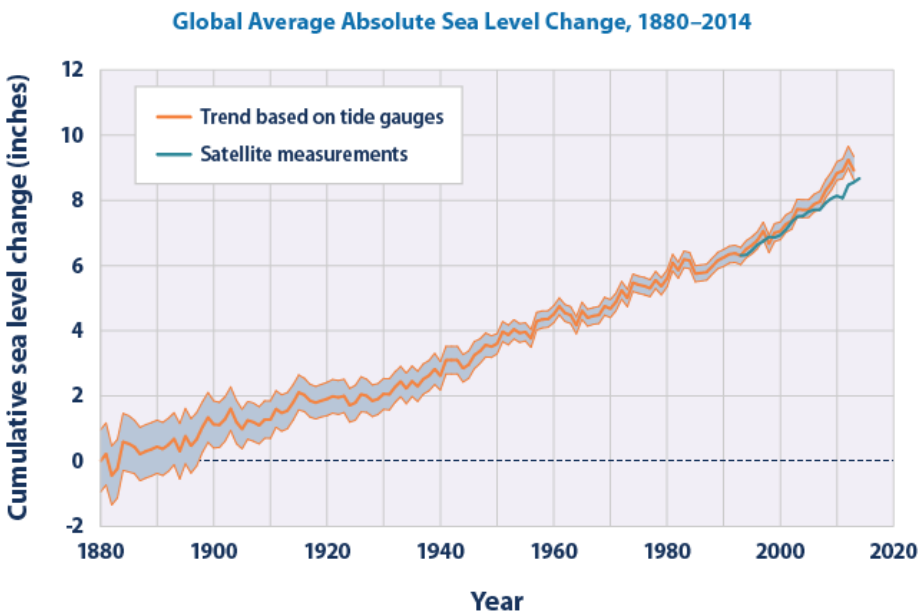
In contrast, many more major metropolitan areas are projected to have a moderate to severe precipitation decrease (droughts) by the end of the 21st century. These include Delhi, India (21.8 m.); Lagos, Nigeria (21 m.); São Paulo, Brazil (20.9 m.); Kolkata, India (14.6 m.); Istanbul, Turkey (14.4 m.); Los Angeles, United States (13.3 m.); Rio de Janeiro, Brazil (12 m.); Paris, France (12 m.); and Lahore, Pakistan (11.3 m.). The largest challenge that these areas are likely to face is a dwindling water supply for drinking and agriculture. See Chapter 8 for more detail on challenges faced by societies to supply clean, reliable water to their populations and farms.

Additional challenges may be felt by all areas of the world with regard to changes in the seasonality or timing of precipitation, as well the form in which precipitation falls (e.g., mist or downpour; rain, ice, or snow). All of these factors affect the availability of soil water for plants,

the flow of rivers and streams, and the overall accessibility of water worldwide. Furthermore, scientists predict an increase in the number and severity of storms as climate change progresses. For a full discussion of the potential impacts of this, see the assigned article.

Sea level rise

While we know that water continuously cycles around the world (see Chapter 8 for information on the water cycle), and that the overall quantity of water on Earth will not change due to global climate change, the distribution of this water is changing. In particular, oceans are increasing in volume while land ice stores (such as **glaciers**) are decreasing. This contributes to an increase in sea level worldwide (Figure 7.15).



Data sources:
- CSIRO (Commonwealth Scientific and Industrial Research Organisation). 2015 update to data originally published in: Church, J.A., and N.J. White. 2011. Sea-level rise from the late 19th to the early 21st century. Surv. Geophys. 32:585–602. www.cmar.csiro.au/sealevel/sl_data_cmar.html.
- NOAA (National Oceanic and Atmospheric Administration). 2015. Laboratory for Satellite Altimetry: Sea level rise. Accessed June 2015. http://ibis.grdl.noaa.gov/SAT/SeaLevelRise/LSA_SLR_timeseries_global.php.

For more information, visit U.S. EPA's "Climate Change Indicators in the United States" at www.epa.gov/climatechange/indicators.

Figure 7.15. This graph shows average absolute cumulative changes in sea level for the world's oceans since 1880, based on a combination of tide gauge measurements and recent satellite measurements. The shaded band shows the likely range of values, based on the number of measurements collected and the precision of the methods used.

From the data in Figure 7.15, we see that sea level has increased at an average of 0.06 inches (0.15 cm) per year over the time period shown above. Most of this rise, however, has occurred within the most recent decades. The rate of increase has gone up to between 0.11 to 0.14 inches

Photographs of McCall Glacier, Alaska, 1958 and 2003

Sources:
- Post, A. 1958. McCall Glacier. Glacier photograph collection. Boulder, Colorado: National Snow and Ice Data Center/World Data Center for Glaciology. http://nsidc.org/data/g00472.html.
- Nolan, M. 2003. McCall Glacier. Glacier photograph collection. Boulder, Colorado: National Snow and Ice Data Center/World Data Center for Glaciology. http://nsidc.org/data/g00472.html.

For more information, visit U.S. EPA's "Climate Change Indicators in the United States" at www.epa.gov/climatechange/indicators.

(0.28 to 0.36 cm) per year since 1993. There are two forces causing sea level to rise, both caused by climate change. First, the increased global temperature has caused increased ice melting in many regions of the globe. Melting **land ice** (such as the glacier shown in figure 7.16) contributes to sea level rise because water that used to be stored in ice sitting on top of land becomes running water which reaches the ocean through **runoff**. We also observe **sea ice** melting (see http://www.epa.gov/climatechange/science/indicators/index.html for data and figures). Sea ice, such as the ice that covers the arctic regions of the Northern Hemisphere, has no land underneath it. When it melts, the water stays in the same locations, and the overall sea level does not change.

The second factor that influences sea level rise is a phenomenon called **thermal expansion**. Due to the physical properties of water, as water warms, its density decreases. A less dense substance will have fewer molecules in a given area than a more dense substance (see Chapter 1 supplemental material). This means that as the overall temperature of the oceans increases due to global climate change, the same amount of water molecules will now occupy a slightly larger volume. This may not seem significant, but considering the 1.3 billion trillion liters (264 billion gallons) of water in the ocean, even a small change in density can have large effects on sea level as a whole.

Scientists have already documented sea level rise in some areas of the world, including one familiar to most of us: the Southeastern United States. Figure 7.17 depicts the measured land area lost due to increasing sea level since 1996. Note that the Southeast (defined here as the

Atlantic coast of North Carolina south to Florida) is particularly susceptible to land area loss due to the gently sloping nature of our coastline. Moving northward into the Mid-Atlantic States (defined here as Virginia north to Long Island, New York), coastal habitats tend to have a steeper geography, which protects against some losses.

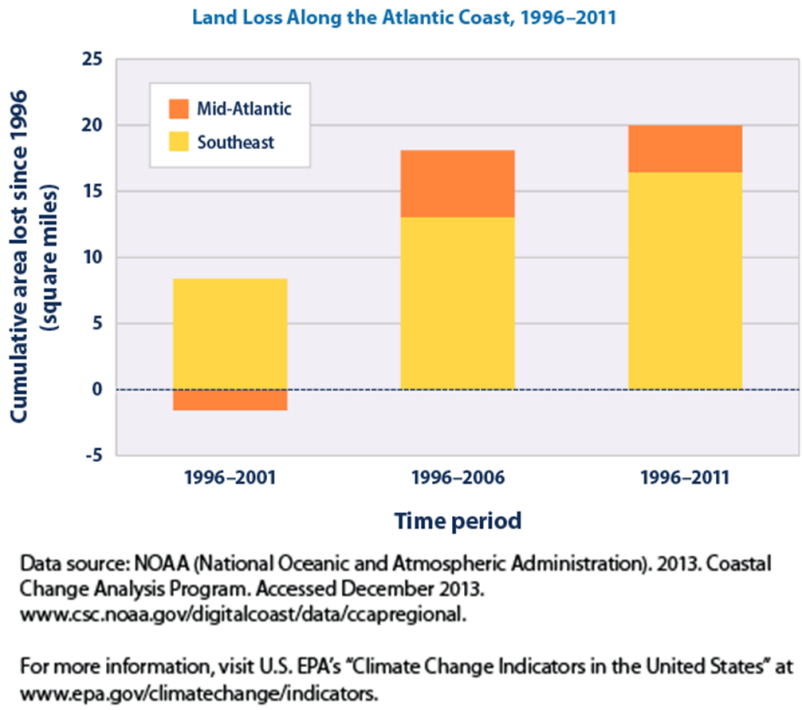


Figure 7.17. This graph shows the net amount of land converted to open water along the Atlantic coast during three time periods: 1996–2001, 1996–2006, and 1996–2011. The results are divided into two regions: the Southeast and the Mid-Atlantic. Negative numbers show where land loss is outpaced by the accumulation of new land.

While the ecological effects of sea level rise remain in the United States, we don't project any catastrophic loss of life, property, or livelihood for some time. This is, in part, due to large investments that we have made in infrastructure to protect our cities and farmlands. This is not the case in many areas of the world. For a discussion of the impacts of sea level rise on less-industrialized nations of Bangladesh, Maldives, Kiribati, and Fiji, review the required article reading.

Ocean acidification

Dissolved CO_2 is essential for many organisms, including shell-building animals and other organisms that form a hard coating on their exterior (e.g., shellfish, corals, Haptophyte algae). This hard coating is built out of **aragonite**, a mineral form of the molecule **calcium carbonate**,

$CaCO_3$. These organisms rely on the formation of **carbonate** ions (see Chapter 1 supplemental material for information on ions), CO_3^{2-}, from dissolved CO_2, through a natural, chemical reaction that occurs. This takes place through a chain-reaction equation, where **bicarbonate** (HCO_3^-) is formed as an intermediate, and **hydrogen ions** (H^+) are generated (equations 7.3 and 7.4).

$$CO_2 + H_2O \leftrightarrow H^+ + HCO_3^- \qquad \textbf{Eq. 7.3}$$

$$HCO_3^- \leftrightarrow H^+ + CO_3^{2-} \qquad \textbf{Eq. 7.4}$$

To have a better visualization of this process, follow along with the interactive graphic at: http://www.whoi.edu/home/oceanus_images/ries/calcification.html.

As you can see, both equations 7.3 and 7.4 each produce one H^+. This is significant to water chemistry because an increase in H^+ concentration means a decrease in the **pH** of the water. You can see in Figure 7.18 that a lower pH means that the liquid is more **acidic**. As shown in the interactive graphic, an increase in CO_2 in the atmosphere causes additional CO_2 to be dissolved in the ocean. This means that more CO_2 in the atmosphere leads to more acidic ocean environments.

Unfortunately for shell-building animals, the buildup of H^+ in the more acidic ocean environment blocks the absorption of calcium and CO_3^{2-}, and makes the formation of aragonite more difficult. An aragonite deficit is already being documented in many of the world's oceans, as shown in Figure 7.19.

The increasing acidity of the world's oceans is resulting in habitat changes across the globe. This is only expected to worsen as atmospheric CO_2 levels continue to increase. Many organisms, including the corals that are the foundation species of the beautiful coral reefs, are very sensitive to changes in ocean pH. Scientists have documented cases of ecosystem destruction through **coral bleaching**, caused by the effects of climate change including ocean acidification and increased temperature. For

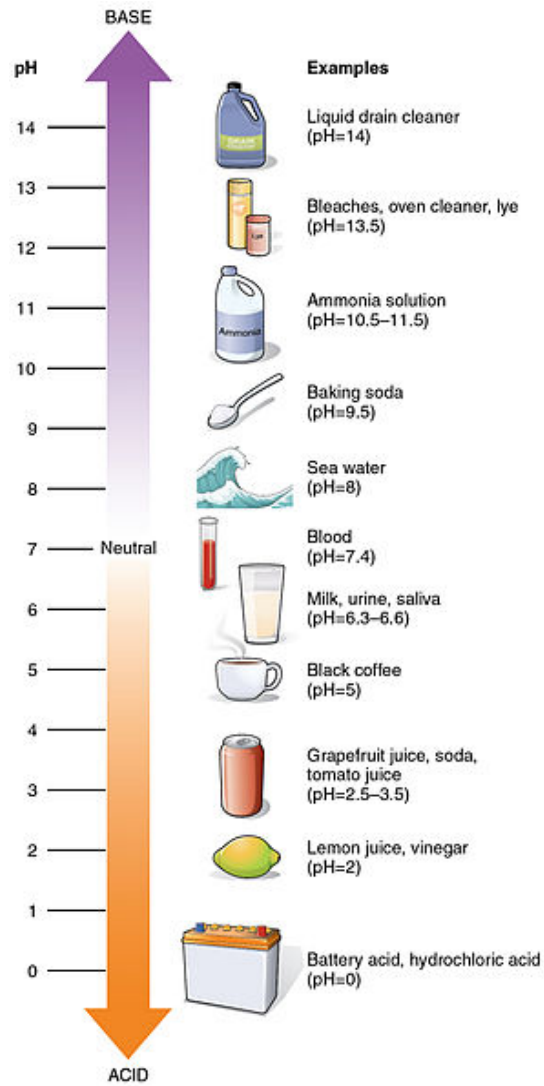


Figure 7.18. The pH scale and relative acidity. Illustration from Anatomy & Physiology, Connexions Web site. http://cnx.org/content/col11496/1.6/, Jun 19, 2013.

more information, visit the NOAA Coral Reef Conservation Program website: http://coralreef.noaa.gov/threats/climate/.

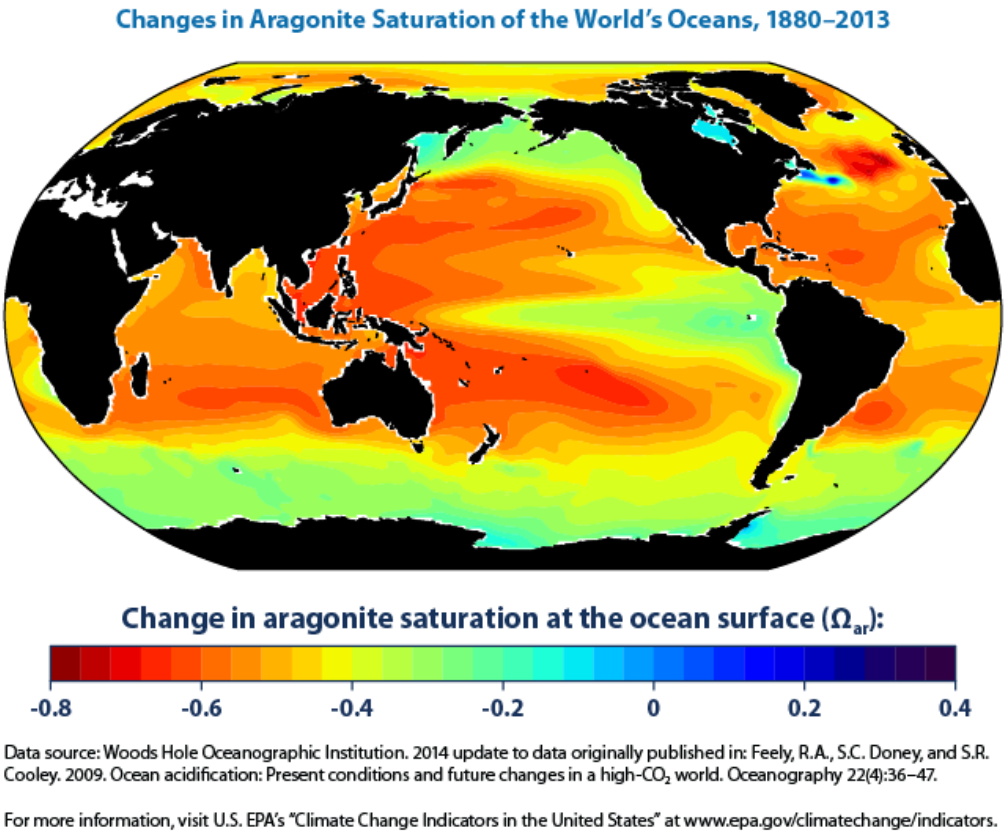


Figure 7.19. This map shows changes in the aragonite saturation level of ocean surface waters between the 1880s and the most recent decade (2004–2013). Aragonite is a form of calcium carbonate that many marine animals use to build their skeletons and shells. A negative change represents a decrease in saturation.

Looking Forward: Climate Solutions

While the situation surrounding global climate change is in serious need of our attention, it is important to realize that many scientists, leaders, and concerned citizens are making solutions to climate change part of their life's work. The two solutions to the problems caused by climate change are **mitigation** and **adaptation**, and we will likely need a combination of both in order to prosper in the future.

Adaptation strategies

We know that climate change is already occurring, as we can see and feel the effects of it. For this reason, it is essential to also adapt to our changing environment. This means that we must

change our behaviors in response to the changing environment around us. Some adaptation strategies are discussed in the required article reading.

Adaption strategies will vary greatly by region, depending on the largest specific impacts in that area. For example, in the city of Delhi, India, a dramatic decrease in rainfall is projected over the next century (Figure 7.14). This city will likely need to implement policies and practices relating to conservation of water, for example: rainwater harvesting, water re-use, and increased irrigation efficiency. Rain-limited cities near oceans, such as Los Angeles, California may choose to use **desalination** to provide drinking water to their citizens. Desalination involves taking the salt out of seawater to make it potable (Chapter 8).

Cities with low elevations near oceans may need to implement adaptation strategies to rising sea levels, from seawalls and levees to relocation of citizens. One adaptations strategy gaining use is the creation or conservation of **wetlands**, which provide natural protection against storm surges and flooding.

Mitigation strategies

In general, a strategy to mitigate climate change is one that reduces the amount of greenhouse gases in the atmosphere or prevents additional emissions. Mitigations strategies attempt to "fix" the problems caused by climate change. Governmental regulations regarding fuel efficiency of vehicles is one example of an institutionalized mitigation strategy already in place in the United States and in many other countries around the world. Unlike some other countries, there are no **carbon taxes** or charges on burning fossil fuels in the United States. This is another governmental mitigation strategy that has been shown to be effective in many countries including India, Japan, France, Costa Rica, Canada, and the United Kingdom.

In addition to government measures and incentives, technology can also be harnessed to mitigate climate change. One strategy for this is the use of **carbon capture and sequestration** (CCS). Through CCS, 80-90% of the CO_2 that would have been emitted to the atmosphere from sources such as a coal-fired power plant is instead captured and then stored deep beneath the Earth's surface. The CO_2 is often injected and sequestered hundreds of miles underground into porous rock formations sealed below an impermeable layer, where it is stored permanently (Figure 7.20).

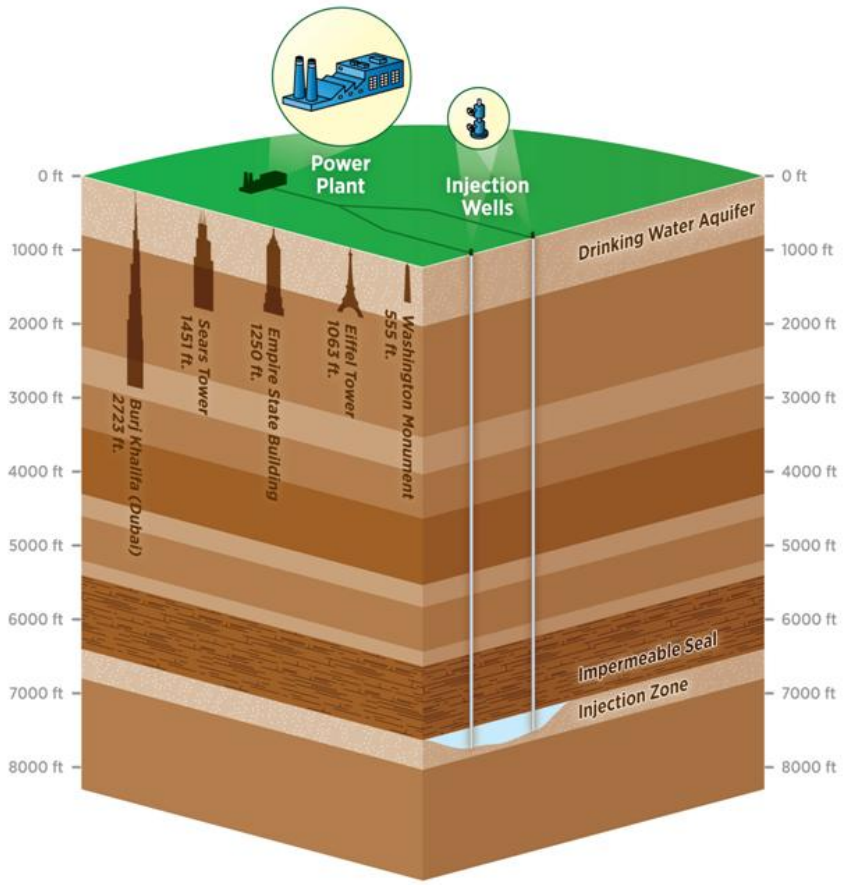


Figure 7.20. Carbon capture and sequestration schematic with landmarks shown to scale for depth reference. Source: US EPA.

Scientists are also looking into the use of soils and vegetation for carbon storage potential. Proper management of soil and forest ecosystems has been shown to create additional carbon sinks for atmospheric carbon, reducing the overall atmospheric CO_2 burden. Increasing soil carbon further benefits communities by providing better-quality soil for agriculture and cultivation.

Technologies related to alternative energy sources (Chapter 5) mitigate climate change by providing people with energy not derived from the combustion of fossil fuels. Finally, simple activities such as energy conservation, choosing to walk or bike instead of driving, and disposing of waste properly are activities that, when done by large numbers of people, actively mitigate climate change by preventing carbon emissions.

Take a moment to identify ways that you personally can be involved in the mitigation of or adaptation to climate change. What changes can you make in your own life to prevent excess carbon emissions? Similar to your ecological footprint, which you should have already calculated in lab, you can also calculate your **carbon footprint**. Use the EPA's carbon footprint

calculator to do so, and investigate the Reduce Your Emissions section to find ways to decrease your carbon footprint.

Resources

Belt, Don. "The Coming Storm." *National Geographic Magazine*, May 2011. http://ngm.nationalgeographic.com/print/2011/05/bangladesh/belt-text

IPCC Fourth Assessment Report: Climate Change 2007 Synthesis Report. 4. Adaptation and mitigation options https://www.ipcc.ch/publications_and_data/ar4/syr/en/spms4.html

NOAA Coral Reef Conservation Program: Climate Change http://coralreef.noaa.gov/threats/climate/

NOAA Geophysical Fluid Dynamics Laboratory: Will the wet get wetter and the dry drier? http://www.gfdl.noaa.gov/will-the-wet-get-wetter-and-the-dry-drier

Ontl, Todd and Lisa Schulte (2012) Soil Carbon Storage. Nature Education Knowledge 3(10):35 http://www.nature.com/scitable/knowledge/library/soil-carbon-storage-84223790

US EPA Carbon Dioxide Capture and Sequestration http://www.epa.gov/climatechange/ccs/

US EPA Carbon Footprint Calculator http://www3.epa.gov/carbon-footprint-calculator/

US EPA Climate Change Indicators in the United States http://www.epa.gov/climatechange/science/indicators/index.html

Terms list

Acidity

Adaptation

Aragonite

Bicarbonate

Calcium carbonate

Carbon capture and sequestration

Carbon footprint

Carbon tax

Carbonate

Climate

Climate change

Coral bleaching

Desalination

Evaporation

Glacier

Global warming

Hydrogen ions

Land ice

Mitigation

pH

Precipitation

Runoff

Sea ice

Thermal expansion

Wetland

Return to Table of Contents

CHAPTER 8: WATER

Learning Objectives

As a result of this unit:

- Students will be able to draw multiple interacting water molecules and identify the bonds and atoms
- Students will explain how the molecular structure of the water molecule contributes to the unique properties of water.
- Students will demonstrate an understanding of how much water is available on Earth and how it is distributed
- Students will be able to compare regional and national responses to water issues.
- Students will be able to explain water-related problems (for example water scarcity, water-borne diseases, water pollution, flooding) from different regions of the world
- Students will be able to explain how human modifications of natural water systems can be both beneficial and destructive
- Students will be able to describe solutions to water-related problems
- Students will be able to read and interpret graphs and charts about water
- Students will demonstrate knowledge of some of the major regulations related to water in the USA
- Students will gain a rudimentary understanding of groundwater flow, management and protection

CHAPTER 8: WATER

This chapter has been adapted from OpenStax (Biology and Concepts in Biology texts), USGS Water Resources, the EPA and The Encyclopedia of Earth

"Whiskey is for drinking. Water is for fighting"

Introduction

Why do scientists spend time looking for water on other planets? Why is water so important? It is because water is essential for life as we know it. Water is one of the more abundant molecules and the one most critical to life on Earth. Approximately 60–70 percent of the human body is made up of water. Without it, life as we know it simply would not exist. The quotation above, which has been attributed to Mark Twain, suggested (by the quote above) that water was extremely important. In recent years, we have seen a rise in conflicts and dispute about water. Fortunately, most of the conflicts have ended up in the courts instead of the battlefields. This chapter is devoted to this precious resource that sustains our planet and its living things.
Chapter outline:

1. Properties of water
    a. hydrogen bonding
    b. Physical state of water
    c. Heat capacity
    d. Heat of Vaporization
    e. Universal Solvent
    f. Cohesion and Adhesion

2. Global Water Distribution and Use
3. The Hydrologic Cycle
4. Components of the Hydrologic Cycle
    a. Atmosphere and precipitation
    b. Rivers and Streams
    c. Lakes, Ponds and reservoirs
    d. Wetlands
    e. Oceans
    f. Groundwater
5. Water Scarcity and Shortage
6. Water Pollution and Quality
    a. Types of water pollution
    b. Sources of water pollution
7. Water Management
    a. Water pollution control
    b. Watershed Management
    c. Regulations

Water

Water is an important commodity for life on Earth and is something we all need in our daily activities. It is referred to by many people as the "essence of life", "blue gold" and "more precious than oil". What makes water so important is its unique and special properties. These special properties of water include water's high heat capacity and heat of vaporization, its ability

to dissolve numerous polar molecules, its cohesive and adhesive properties, and its dissociation into ions that leads to the generation of pH. Understanding these characteristics helps us understand and appreciate its importance in maintaining life on Earth. Before we discuss these properties, we will review the molecular structure of water, which gives rise to these special properties.

Properties of Water

A water molecule is composed of one oxygen and two hydrogen atoms that are joined together by **polar covalent** bonds. Covalent mean that the atoms share electrons, instead of completely giving up electrons to one another. **Polar** means that the electrons are not shared equally. These polar covalent bonds (**Figure 8.1**), along with the molecular shape, cause the water molecule to have a slightly positive charge on the hydrogen end and a slightly negative charge on the oxygen side. Water's charges are generated because oxygen is more electronegative than hydrogen, making it more likely that a shared electron would be found near the oxygen nucleus than the hydrogen nucleus, thus generating the partial negative charge near the oxygen. This gives water molecules their properties of attraction.

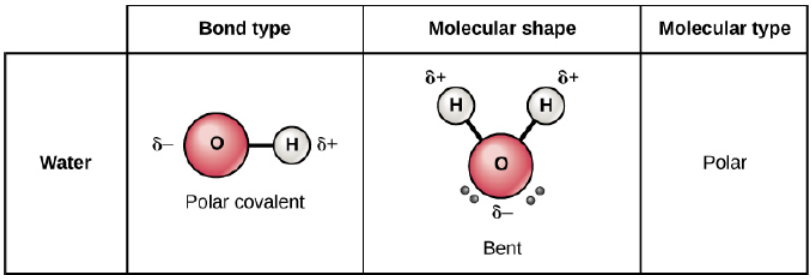


Figure 8.1: Polarity of the water molecule due to the uneven distribution of electrons in its covalent bond. C (From OpenStax Concepts of Biology text)

Hydrogen Bonds

Due to water's polarity, each water molecule attracts other water molecules as oppositely charged ends of the molecules attract each other. When this happens, a weak interaction occurs between the *positive* hydrogen end from one molecule and the *negative* oxygen end of another molecule. This interaction is called a **hydrogen bond**. This hydrogen bonding contributes to the following water's unique properties.

1. Water is the universal solvent
2. Exists in nature as a solid, liquid, and gas
3. The density of ice is less than liquid water
4. Water has a high surface tension
5. Water has a high heat capacity
6. Water exists as a liquid at room temperature

It is important to note here that even we are only focusing on water in this text book, hydrogen bonding also occurs in other substances that have polar molecules**.**

Physical State of Water on Earth

Water on Earth can naturally exist as either solid, liquid or gas depending on the prevailing temperature and pressure conditions. The formation of hydrogen bonds (described above) is an important quality of liquid water that is crucial to life as we know it on Earth. As water molecules make hydrogen bonds with each other, liquid water takes on some unique physical and chemical characteristics when compared to other liquids. In liquid water, hydrogen bonds are constantly being formed and broken as the water molecules slide past each other. The energy of the moving water molecules (kinetic energy) is responsible for breaking the bonds. When heat is added to water (increasing temperature), the kinetic energy of the molecules goes up and more bonds are broken. As more heat is added to boiling water, the higher kinetic energy of the water molecules causes the hydrogen bonds to break completely and allow them to escape into the air as water vapor. On the other hand, when the temperature of water is reduced and water freezes, the water molecules form a crystalline structure maintained by hydrogen bonding (since there isn't enough energy to break the hydrogen bonds). The crystalline structure, ice, has a more open structure than the liquid form of water. The open structure of ice (Figure 8.2) makes ice less dense than liquid water, a phenomenon not seen in the solidification of other liquids.

The lower density of ice, illustrated in Figure 8.2, causes it to float at the surface of liquid water, such as an iceberg in the ocean or ice cubes in a glass of ice water. In lakes and ponds, ice will form on the surface of water creating an insulating barrier that protects animals and plant life that live in the water from freezing. Without this layer of insulating ice, plants and animals living in the water would freeze in the solid block of ice and not survive. The ice crystals that form upon freezing would rupture the delicate membranes essential for the function of living cells, irreversibly damaging them.

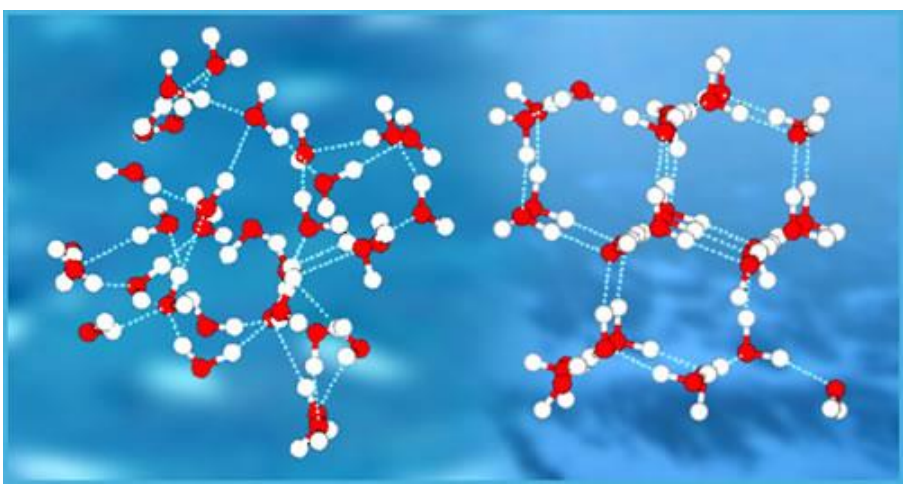


Figure 8.2: Hydrogen bonding makes ice less dense than liquid water. The lattice structure water is more condensed (left structure) than that of ice (right structure). The lattice structure of ice makes it less dense than freely flowing molecules of liquid water, enabling ice to float on liquid water. (Image credit: Lynn Yarris, http://www2.lbl.gov/Science-Articles/Archive/sabl/2005/February/water-solid.html)

High Heat Capacity

Water has the highest **specific heat capacity** of any liquid. Water's high heat capacity is a property caused by hydrogen bonding among the water molecules. **Specific heat** is defined as the amount of heat one gram of a substance must absorb or lose to change its temperature by one degree Celsius. For water, this amount is one **calorie**. It takes water a long time to heat up and a long time to cool down. In fact, the specific heat capacity of water is about five times more than that of sand. This explains why land cools faster than the sea. Due to its high heat capacity, warm

blooded animals use water to disperse heat more evenly and maintain temperature in their bodies: it acts in a similar manner to a car's cooling system, transporting heat from warm places to cool places, causing the body to maintain a more even temperature.

Heat of Vaporization

Water also has a high **heat of vaporization**, the amount of energy required to change one gram of a liquid substance to a gas. A considerable amount of heat energy (586 calories) is required to accomplish this change in water. This process occurs on the surface of water. As liquid water heats up, hydrogen bonding makes it difficult to separate the liquid water molecules from each other, which is required for it to enter the gas phase (steam). Thus, water acts as a heat sink and requires much more heat to boil than liquids such as ethanol, whose hydrogen bonds are weaker. Eventually, as water reaches its boiling point of 100° Celsius (212° Fahrenheit), the heat can break the hydrogen bonds between the water molecules, and the kinetic energy between the water molecules allows them to escape from the liquid as a gas. Even when below its boiling point, water's individual molecules acquire enough energy from other water molecules such that some surface water molecules can escape and vaporize: this process is known as **evaporation**.

Since hydrogen bonds need to be broken for water to evaporate means that a substantial amount of energy is used in the evaporation process. As the water evaporates, energy is taken up by the process, cooling the environment where the evaporation is taking place. In many living organisms, including in humans, the evaporation of sweat, which is 90 percent water, allows the organism to cool so that homeostasis of body temperature can be maintained.

Water is a Solvent

Since water is a polar molecule with slightly positive and slightly negative charges, ions and polar molecules can readily dissolve in it. Water is, therefore, referred to as a **solvent**, because it is capable of dissolving more substances (polar substances) than any other liquid. The charges associated with these molecules will form hydrogen bonds with water, surrounding the particle with water molecules. This is very important as it enables water to dissolve various chemicals and distribute them within living organisms, including taking toxic substances out of living things, and in the environment.

Water's Cohesive and Adhesive Properties

Have you ever filled a glass of water to the very top and then slowly added a few more drops? Before it overflows, the water forms a dome-like shape above the rim of the glass (Figure 8.3)

Figure 8.3. Water in a glass form a dome shape above the glass due to cohesive forces of attraction among water molecules. Photo Credit: Sam Mutiti

This water can stay above the glass because of its **cohesive** properties. In cohesion, water molecules are attracted to each other (because of hydrogen bonding), keeping the molecules together at the liquid-gas (water-air) interface, although there is no more room in the glass. Cohesion allows for the development of **surface tension**, the capacity of a substance to resist rupture when placed under tension or stress. This is also why water forms droplets when placed on a dry surface rather than being flattened out by gravity (**Figure 8.4**)

Figure 8.4. Beading up of water due strong cohesive forces between water molecules (Water USGS, right hand photo credit: J Schmidt; National Park Service).

When a steel needle is placed carefully on water it does not sink even though steel is denser (heavier) than the water. Cohesion and surface tension keep the hydrogen bonds of water molecules intact and support the item floating on the top. It is even possible for an insect to "float" on water if it sits gently without breaking the surface tension, as shown in **Figure 8.5**.

Figure 8.5 The weights of the needle and water strider are pulling the surface downward; at the same time, the surface tension is pulling it up, suspending them on the surface of the water and keeping them from sinking. (Credit: Cory Zanker (left) and Tim Vickers (right)

Another important property of water is **adhesion**, or the attraction between water molecules and other molecules. This attraction is sometimes stronger than water's cohesive forces, especially when water is exposed to charged surfaces such as on the inside of thin glass tubes known as capillary tubes. Adhesion is observed when water "climbs" up the tube placed in a glass of water: notice that the water appears to be higher on the sides of the tube than in the middle. This is because the water molecules are attracted to the charged glass walls of the capillary tube more than they are to each other and, therefore, adhere to it. This type of adhesion is called **capillary action**, and is illustrated in **Figure 8.6**. This process is also involved in the movement of water and nutrients from the soil around the root systems to other parts of plants above the ground.

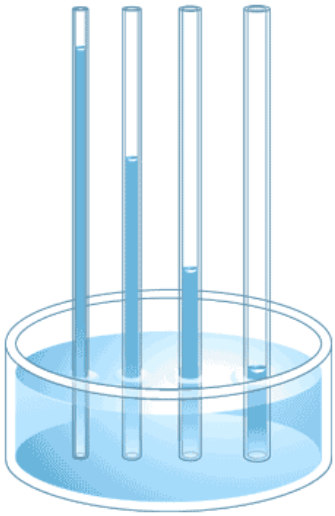


Figure 8.6: Capillary action in a glass tube is caused by the adhesive forces exerted by the internal surface of the glass exceeding the cohesive forces between the water molecules themselves. (Credit: http://moodle.clsd.k12.pa.us/district_videos/Biology/iText/products/0-13-115540-7/ch23/ch23_s5_1.html)

Global Water Distribution and Use

Most of the water on the planet is in oceans and unavailable for human consumption due to its high salinity (**Figure 8.7**).

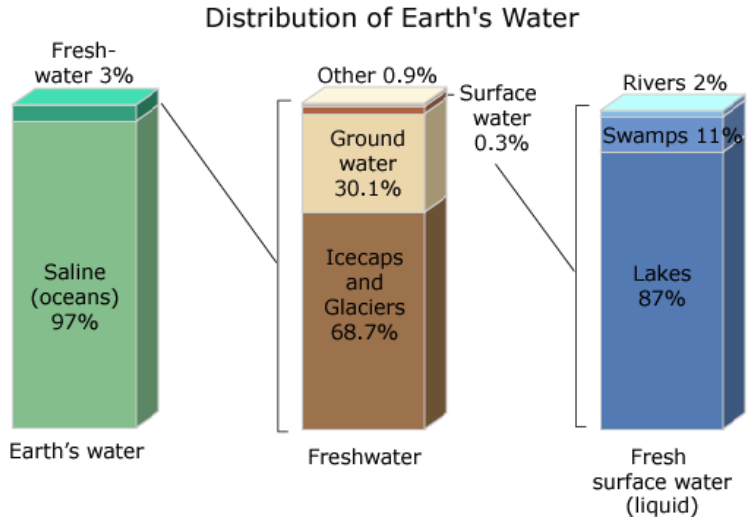


Figure 8.7: Graphical representation of available water: http://water.usgs.gov/edu/earthwherewater.html

Of all the water in the world, only about 0.64% is fresh water that is available for consumption (the other fresh water is locked up in ice). Of this available fresh water, 98.4% is found as groundwater below the surface of the Earth and only 1.4% is surface water in rivers and lakes.

The largest percentage of water withdrawn in the US goes to thermoelectric cooling (**Figure 8.8**). In some countries, such as Egypt, irrigation accounts for over 70% of water withdrawn. Irrigation is water that is applied by a water system to sustain plant growth. Irrigation also includes water that is used for frost protection, application of chemicals, weed control, field preparation, crop cooling, harvesting, dust suppression, and leaching salts from the root zone.

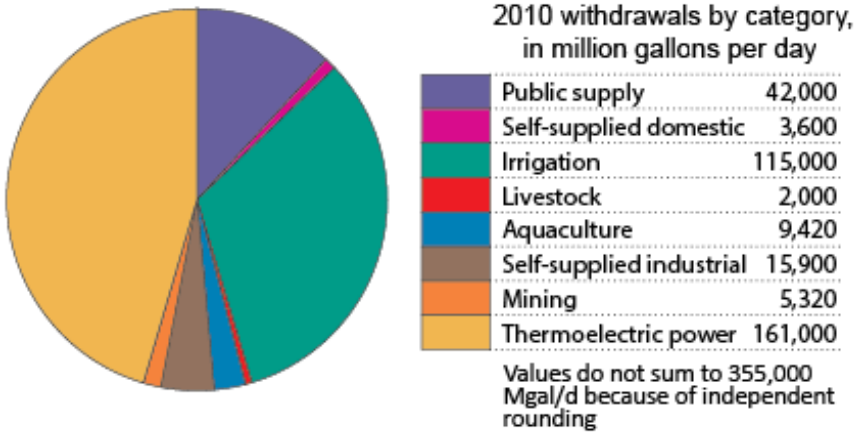


Figure 8.8: Estimated 2010 water withdrawals. Irrigation and thermoelectric power usages account for most water withdrawals. http://water.usgs.gov/watuse/images/category-pages/2010/total-category-pie-2010.png
More water use terminology can be found at: http://water.usgs.gov/watuse/wuglossary.html

The Hydrologic Cycle

The major water reservoirs on Earth are oceans, glaciers, groundwater, rivers, and lakes. Water spends different amounts of time in the various reservoirs. The main factors that control the amount of time water stays in a reservoir are the amount of water in the reservoir and how fast water moves in and out. The hydrologic cycle (water cycle) represents a continuous global cycling of water from one reservoir to another **8.9**.

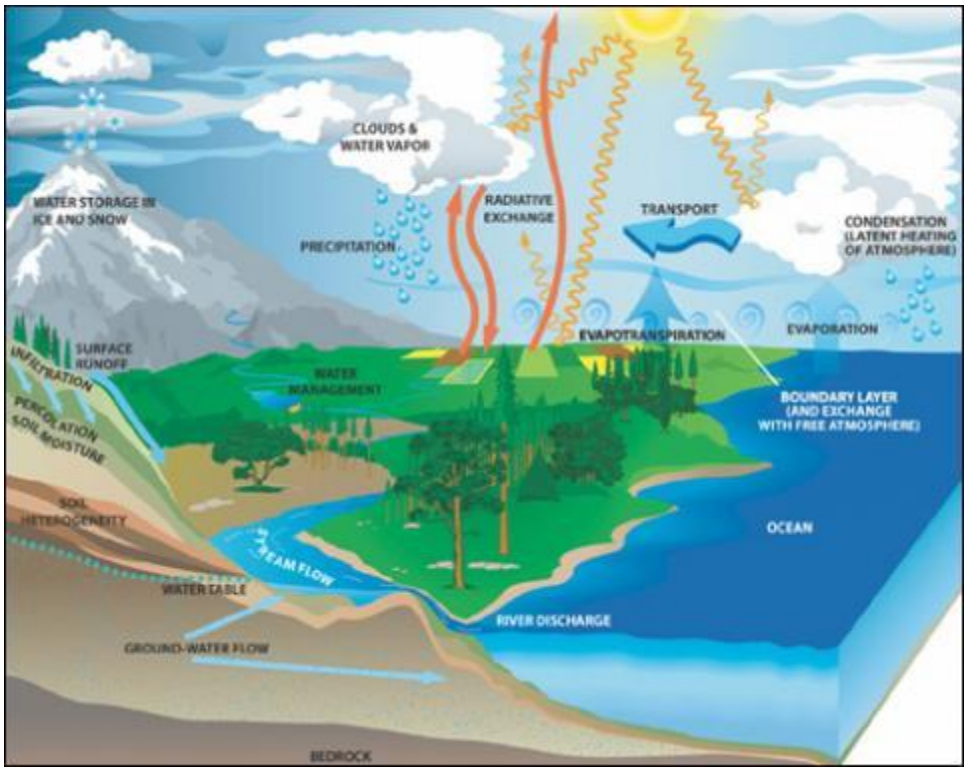


Figure 8.9: The water cycle at the global scale showing water moving through all the major reservoirs, including the ocean reservoir (source https://science.nasa.gov/earth-science/oceanography/ocean-earth-system/ocean-water-cycle).

To gain a deeper appreciation of the water cycle, let us follow a water molecule through the water cycle. Starting in the ocean (an arbitrary starting point) the water molecule can become part of the water that is converted into vapor and enter the atmosphere. Heat energy from the sun, which drives the water cycle, heats water in the oceans and cause evaporation. Evaporation is the process by which water changes from a liquid to a gas or vapor. Evaporation is the primary pathway that water takes from the liquid state back into the water cycle as atmospheric water vapor. Nearly 90% of moisture in the atmosphere comes from evaporation, with the remaining 10% coming from transpiration. **Transpiration** is the process by which moisture is carried through plants from roots to small pores (**stoma**) on the underside of leaves, where it changes to

vapor and is released to the atmosphere. Transpiration is essentially evaporation of water from plant leaves. Rising air currents take the vapor up into the atmosphere, along with water from **evapotranspiration,** which is a combination of water transpired from plants and that evaporated from the soil. The vapor rises into the air where cooler temperatures cause it to condense into clouds. **Condensation** is the process by which water vapor is converted from gaseous state back into liquid state. Clouds might eventually grow bigger and moist enough to release the water molecule in the form of **precipitation**. Precipitation is water falling from the clouds in the atmosphere in form of ice (snow, sleet, hail) or liquid (e.g. rain, drizzle). Precipitation that falls as snow can accumulate as ice caps and glaciers.

Did you know that the largest glacier on Earth is the Severny Island ice cap in the Russian Arctic?

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Precipitation that falls as liquid usually ends up as **surface flow** and **stream flow**. **Surface runoff** is precipitation which travels over the soil surface to the nearest stream channel. **Stream flow** is the movement of water in a natural channel, such as a river. Most precipitation falls directly onto the ocean and returns the water molecule back to restart the journey. This is also true for surface runoff, most of the water eventually returns to the ocean via stream flow. This also returns the water molecule back the ocean to start the journey again.

A portion of the water that falls as precipitation can enter lakes where it can evaporate back into the atmosphere, condense, and fall back as precipitation again. Water in the lake can also be taken up by plants and transpired back into the atmosphere. Some of the water that falls as precipitation can infiltrate into the ground and become part of groundwater. **Infiltration** is the process by which water enters the subsurface by gravitation pull. Some of the water infiltrates into the ground and replenishes **aquifers** (saturated subsurface rock), which store huge amounts of freshwater for long periods of time. Some infiltration stays close to the land surface and can seep back into surface-water bodies (and the ocean) as **groundwater discharge**, and some groundwater finds openings in the land surface and emerges as freshwater **springs.** Plant roots absorb yet more groundwater to end up as evapotranspiration from the leaves. Over time, though, all this water keeps moving and most of it ends up in the ocean.

Components of the Hydrologic Cycle

Most precipitation falls in the form of rain but there are other forms such as snow, hail, and sleet. Once it runs sufficiently, surface water runoff is generated when the ground is saturated or impervious. **Surface water** is a major component of the hydrological cycle and one that we interact with very regularly. It includes lakes, wetlands, stormwater **runoff** (overland flow), ponds, potholes, rivers and streams.

Streams and Rivers

A river forms from water moving from a higher altitude to lower altitude, under the force of gravity. When rain falls on the land, it either evaporates, seeps into the ground or becomes runoff (water running on the surface). When water runs on the land surface it usually converges as it moves towards lower elevation. The converging runoff can concentrate into single channels of conveyance called creeks, stream, or rivers. Usually these start as small rill and rivulets that would join up downhill into larger streams and creeks which can also join up downstream to form even bigger rivers. The streams and rivers that join up to form a larger river are called **tributaries, Figure 8.10**. The land area drained by a river and all its tributaries is called a **watershed** or catchment or river basin

The area adjacent to a river that floods frequently is a called a floodplain. **Floodplains** are areas that rivers use to temporarily store excess water during storm events and frequently contain very fertile soils. This has historically encouraged humans to move into floodplains and use them for agriculture, resulting in a reduction in the capacity of the floodplain to act as temporally storage for excess water during storm events, causing increased damaging flooding downstream. Properly functioning floodplains reduce the negative impacts of floods (by reducing severity of flood), and they assist in filtering stormwater and protecting the water quality of rivers. They also act as areas of recharge for groundwater.

A

B

C

Figure 8.10: River systems. (A) A river with a small tributary (B) A meandering river with a mature floodplain (C) A satellite image of river system with multiple tributaries (Source USGS)

The US has numerous rivers that run throughout the nation's landscape. It is estimated that the US has over 200, 000 rivers with the Mississippi River being the largest by volume despite it only being the second longest. The Missouri River is the longest river in US. Most states have at least one important river. In Georgia, the main rivers are the Flint, Ochlockonee,

Suwannee, Saint Marys, Satilla, Ogeechee, Altamaha, Oconee, Savannah, Chattahoochee, Tallapoosa, Coosa, Ocmulgee and the Tennessee rivers (**Figure 8.11**).

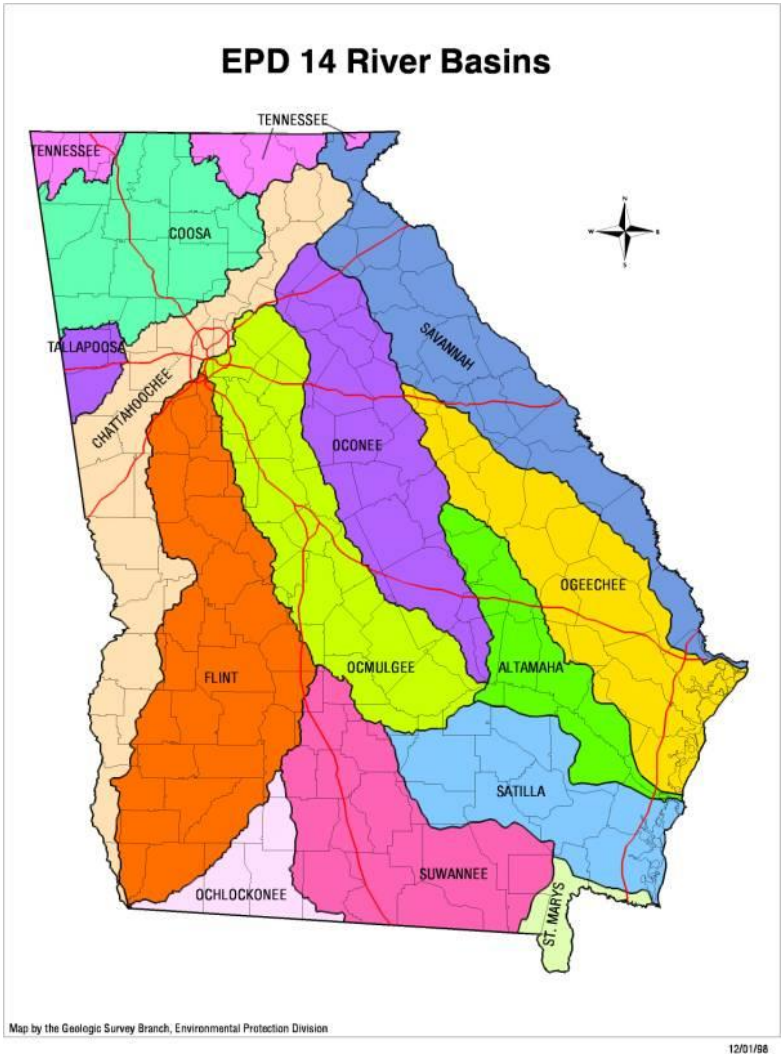


Figure 8.11: Major watershed of Georgia representing the main rivers in the state. (Source Georgia Environmental Protection Division: georgiaadoptastream.com)

These rivers are very important for supplying water to the cities and populations of the states. The rivers also contain important biological communities and provide opportunities for recreation such as swimming, fishing, and white water rafting. Rivers are so important and largely control settlement patterns all over the world. Major cities, communities, factories, industries, and power stations are located along rivers. It is, therefore, very important to protect the quality and integrity of rivers all over the world.

Unfortunately, most of the rivers in the world are too polluted to support certain human activities, especially swimming, fishing, and drinking. Close to half of the rivers in the US have been deemed too polluted to support swimming and fishing. A lot of the rivers have also been channelized, dredged, or impounded by dams which have ruined their ability to support a lot of human and biological activities. It is estimated that over 600, 000 river miles have been dammed in the US. Benefits of dams to humans include providing a source of water (reservoirs and farms ponds), recreation waters and reducing local flooding. On the other side, dams can also have negative impacts on people and the environment. They can lead to increased severe flooding downstream of the dam, especially during high rain events.

The impoundments can trap stream sediments resulting in reduced sediment supply downstream as well as increased deposition behind the dam. This shift in sediments flow can disrupt and damage aquatic habitats and can increase downstream stream erosion due to lack of sediment supply. The impoundments can also prevent certain aquatic organisms from migrating either upstream or downstream, therefore reducing their range and abilities to survive

environmental changes as well cutting them off from spawning areas. Construction of dams can also result in displacement of the local people and loss of traditional lands and cultural history. Reservoirs and ponds usually form behind these impoundments.

Lakes, Reservoirs and ponds: If water flows to a place that is surrounded by higher land on all sides, a lake will form (**Figure 8.12**). A lake, pond or reservoir is a body of standing water on the land surface. When people build dams to stop rivers from flowing, the lakes that form are called reservoirs. It is estimated that over 300 million water bodies in the world are lakes, reservoirs, and ponds. Most of the Earth's lakes (about 60%) are found in Canada. Even though lakes and rivers contain less than 1% of the Earths water, the US gets over two thirds (70%) of its water (for drinking, industry, irrigation, and hydroelectric power generation) from lakes and reservoirs. Lakes are also the cornerstone of the US's freshwater fishing industry and are the backbone of the nation's state tourism industries and inland water recreational activities. (http://water.epa.gov/type/lakes/)

Figure 8.12: Lake Sinclair in Baldwin and Putnam counties (Photo Credits: GCSU Hydrology Research lab)

Wetland: A **wetland** is an area which is home to standing water for notable parts of the year, has saturated soils for a large part of the year and has plants that require large amounts of water to survive. Wetlands include swamps, marshes, and bogs. Wetlands are identified using three characteristics: soils (water-saturated soils are present), hydrology (shallow water table) and vegetation (wetland plants that are adapted to areas that are saturated with water for long periods of time). Wetlands are very important areas of biological diversity and productivity. These are also important areas where geochemical and biological cycles/ processes are consistently taking place. For instance, wetlands are considered as areas of significant carbon sequestration (storage), which impacts global climate change. They also act as filters for storm-water runoff before it enters rivers and lakes.

Oceans

As you have probably already guessed, oceans are an important component of the hydrologic cycle because they store majority of all water on Earth (about 95%). Most of the major rivers drain into them. The five oceans covering the surface of the Earth are the Atlantic, Indian, Pacific, Arctic and the Southern Ocean (**Figure 8.13**).

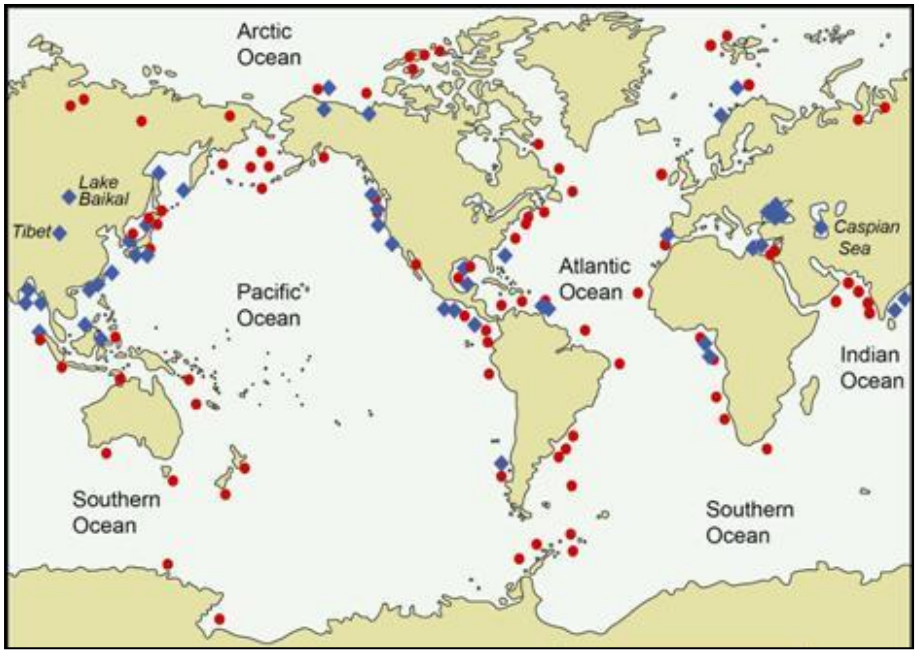


Figure 8.13: The five oceans found on planet Earth. The Pacific Ocean is the largest. Source: https://woodshole.er.usgs.gov/project-pages/hydrates/primer.html

Approximately 90 % of the water that is evaporated into the hydrologic cycle comes from the ocean. Oceans are an important and large part of the hydrologic cycle, with lots biological diversity and many landforms. *Did you know that the average depth of the oceans is about 3.6 km with a maximum depth that can exceed 10 kilometers in areas known as ocean trenches?* The ocean is also home to many forms of life uniquely adapted to survive in this habitat. Unfortunately, humans have degraded the oceans and their life through pollution, overfishing, carbon dioxide acidification and resource exploitation. **Figure 8.14** shows a couple of examples of human impacts on the ocean environment.

From NOAA Libraries

Figure 8.14: Trash washed up on the beach (A) and seal tangles up and being struggled by plastic trash in the ocean (B).

Also watch the video from the Habitable Planet: Oceans Video
vhttp://www.learner.org/courses/envsci/unit/text.php?unit=3&secNum=1

Groundwater

Storage and Flow

Almost 99% of the available fresh water is found below the surface as groundwater. Groundwater is not created by some mysterious processes below ground, but is part of the recycled water in the hydrologic cycle. When precipitation falls, some of the water runs off on the surface while some infiltrates into the ground. Groundwater is replenished when water moves from the surface, through unsaturated rocks or sediment (**unsaturated**), all the way down the saturated parts (**saturated zone**) in a process called infiltration and becomes groundwater (**Figure 8.15**). The top of the saturated portion is called the **water table**, which is the boundary between saturated and unsaturated zone.

Groundwater is found in **aquifers**, which are bodies of rock or sediment that store (and yield) large amounts of usable water in their pores. Aquifer productivity is controlled by **porosity** and **permeability**. **Porosity** is the percentage of open space in a rock or sediment body. **Permeability** is the ability of subsurface material to transmit fluids. Groundwater is found in the saturated zone of a rock body where all pores are filled with water. An important concept is that surface water always moves from higher elevation to lower elevation while groundwater always moves from higher energy (hydraulic head) to lower energy.

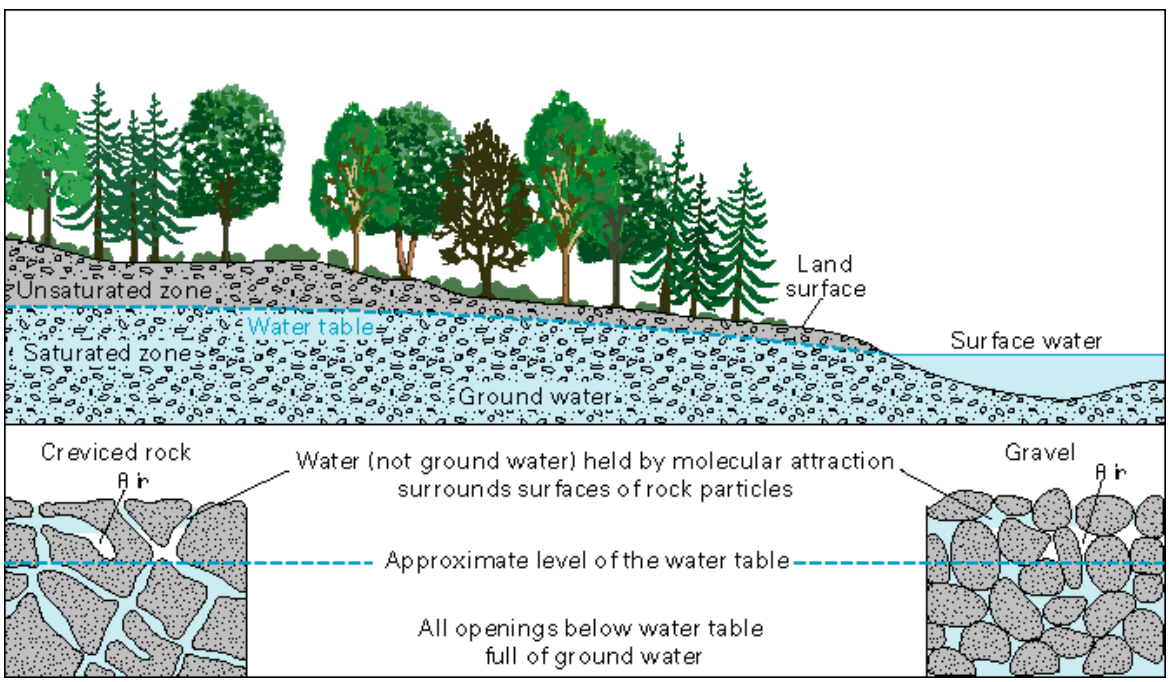
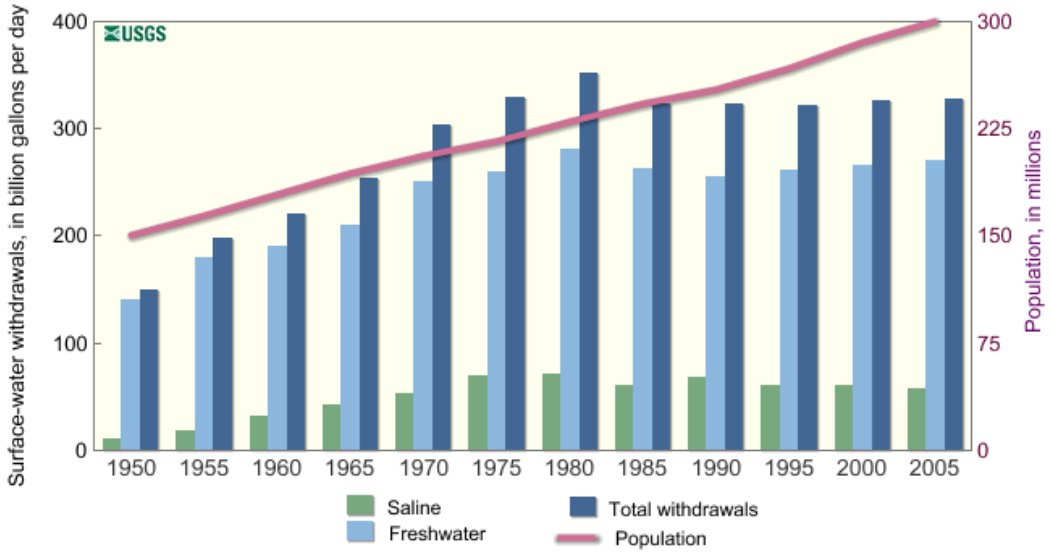


Figure 8.15: Model of groundwater system showing the different components of an unconfined groundwater system: http://water.usgs.gov/edu/earthgwaquifer.html

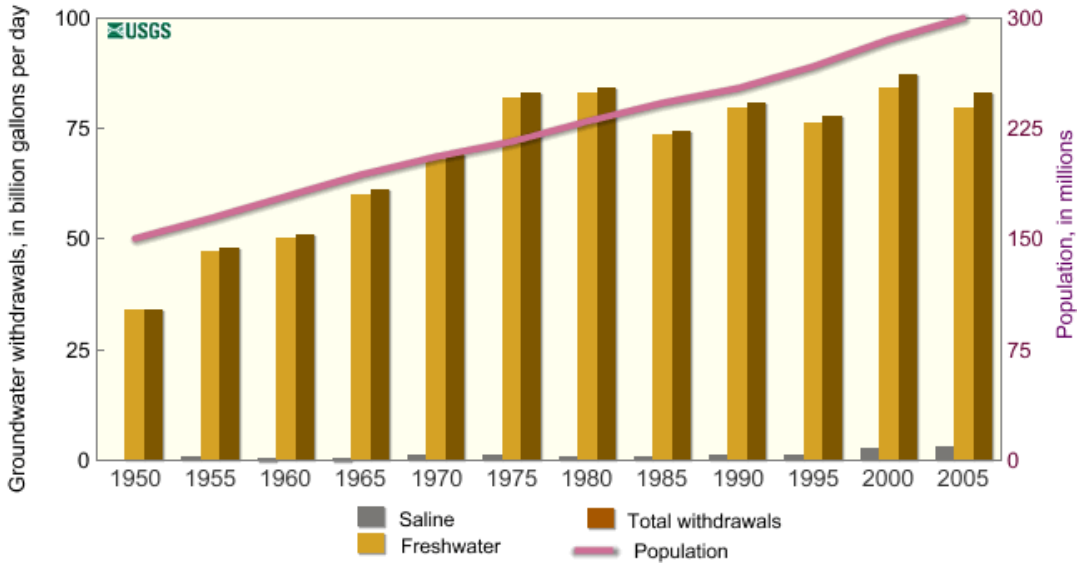
Groundwater will continue to flow until it emerges as a spring, or discharges into surface water bodies on the land or in the ocean. To utilize groundwater, we drill holes (wells) into the ground and pump the water out.

Water Scarcity and Shortage

Water has been identified as one of the major environmental crisis facing the world today. More than one billion people in the world lack access to clean drinking water. The demand for water has grown at a very fast pace in response to the rate of global population growth. **Figures 8.16, and 8.17** illustrate this change in water use over time. It is predicted that over the next two decades, the average supply of water per person will drop by a third.



A)



B)

Figure 8.16: Trends in fresh and saline water withdrawals in response to population growth (A) surface water withdrawals (B) Groundwater withdrawal trends: http://water.usgs.gov/edu/wugw.html

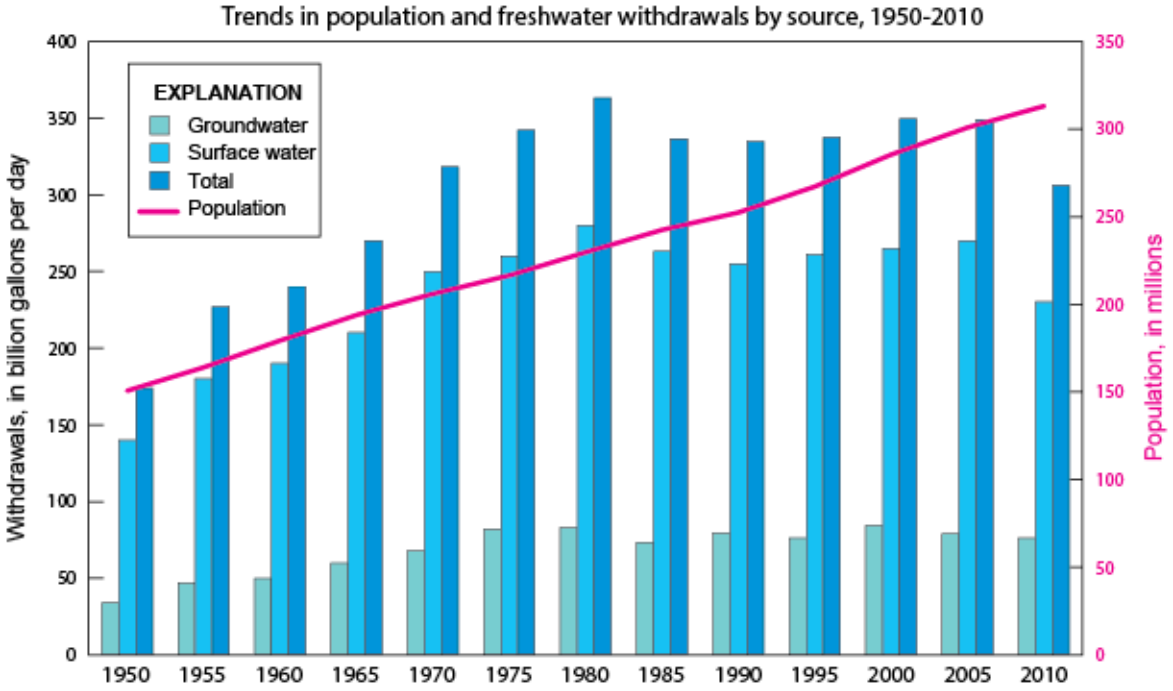


Figure 8.17: Both groundwater and surface water withdrawals had increased over time until 1980 when the withdrawals peaked and stabilized.

Water Scarcity and Availability

There is enough fresh water on Earth to supply every human being with enough drinking water. The main problem we face with regards to water is that it is unevenly distributed, polluted, mismanaged and wasted. Tony Allan, the author of Virtual Water, asserts that water follows money. This refers to the fact that rich countries and societies with money and affluence have more access to safe drinking water even when they live in regions without much water. It also means that areas with large supplies of water can still have water scarcity if they lack the financial resources to build the infrastructure to supply people with safe clean drinking water. Water scarcity is caused by the demand for water being greater than the supply. Scarcity can be defined as either **physical scarcity** or **economic scarcity**.

Physical water scarcity is a situation where there is an actual shortage of water, regardless of quality or infrastructure. It is estimated that about 1.2 million people around the world are experiencing physical water scarcity. **Economic scarcity** is a condition where countries lack the financial resources and/or infrastructure to supply their citizens with reliable safe drinking water. About 1.6 billion people are experiencing economic water shortage; most of them live in less industrialized countries. For a lot of places in the world, scarcity is a transient condition that can be reduced or eliminated by installing the right infrastructure. The major problem in less industrialized countries is the lack of political, financial, and physical structures to provide water to everyone. A few rich people in these countries get the clean water while the majority of the people who cannot afford to pay for it are left out. Examples of such communities include many villages in Africa, Asia, and South America. **Figure 8.18** shows communities in south east Kenya that are experiencing severe water shortages primarily due to lack of infrastructure. Women in these communities must walk long distances to get untreated and contaminated water for drinking and other household needs.

Figure 8.18: Communities in southeast Kenya without ready access to safe drinking water. (A) Groundwater in the area is too salty for consumption. B) Maasai women in Amboseli National Park collecting water from a wetland. (C) Women in Magwede village in SE Kenya walking long distances to get water from a Kiosk. D) Children collecting water in Bungule Village from a water kiosk that is only open for about an hour every day. *Photo credit: Jonathan Levy, Sam Mutiti and Christine Mutiti*

Water Quality (pollution)

Water pollution is a major problem facing many of our surface water and groundwater sources. Contamination can both be natural due to geologic or meteorological events and anthropogenic (human causes). Human sources of contamination can be categorized as either point source or nonpoint source. **Point-source pollution** is water pollution coming from a single point, such as a sewage-outflow pipe. **Non-point source (NPS) pollution** is pollution discharged over a wide land area such as agricultural runoff and urban stormwater runoff, not from one specific location. Non-point source pollution contamination occurs when rainwater, snowmelt, or

irrigation washes off plowed fields, city streets, or suburban backyards. As this runoff moves across the land surface, it picks up soil particles and pollutants, such as nutrients and pesticides.

Types of Water Pollution

Contamination of water resources comes in the form of chemical, biological, and physical pollution. **Chemical pollution** includes things such as toxic metals, organic compounds, acidic waters from mining activities and industry, pharmaceuticals and many other chemical compounds from industries and wastewater treatment plants. Another form of chemical pollution is radioactive waste which has a significant potential to cause harm to living things. Most of the radioactive pollution comes from agricultural practices such as tobacco farming, where radioactive phosphate fertilizer is used. **Physical pollution** includes sediment pollution, trash thrown in the water bodies, thermal and other suspended load. Temperature typically affects the metabolism of aquatic fauna in a negative way and can encourage eutrophication. **Biological pollution** usually refers to pathogenic bacteria, viruses, and parasitic protozoa. Common pathogenic microbes introduced into natural water bodies are pathogens from untreated sewage or surface runoff from intensive livestock grazing. Biological pollution is a common cause of illness and death in less industrialized countries where population density, water scarcity and inadequate sewage treatment combine to cause widespread parasitic and bacterial diseases.

Sources of water pollution

Most of the common inorganic chemical water pollutants are produced by non-point sources, mainly intensive agriculture, and high-density urban areas. Specific inorganic chemicals and their major sources are: ammonium nitrate and a host of related phosphate and nitrogen compounds used in agricultural fertilizers; heavy metals (present in urban runoff and mine tailings area runoff). However, some inorganic contaminants such as chlorine and related derivatives are produced from point sources, ironically employed in water treatment facilities. Moreover, some of the large dischargers of heavy metals to aquatic environments are fixed point industrial plants.

High concentrations of nitrogen (N) and phosphorus (P) in water can cause **eutrophication**. You are seeing this whenever you notice the greenish tint to the water in our local streams and rivers during low-flow times, or if you have ever seen a green farm pond. These nutrients are primarily coming from:

- treated wastewater (laden with P and N) being dumped into the river from sewage plants,
- agricultural areas where farmers allow livestock direct access to the stream, and
- agricultural areas where there is intense fertilizer application, and from landscapes (homes, gardens, golf courses) with fertilizer runoff.

The N and P act as fertilizers in the water and promote algae blooms. As the algae dies, it is decomposed by aerobic bacteria in the water. These bacteria use up the oxygen in the water and the low dissolved oxygen (DO) levels can results in “fish kills” where large numbers of fish, and other aquatic life, die because of suffocation. The dead zone in the Gulf of Mexico is a huge area of low DO that has a large negative impact on the fishing industry along the Gulf Coast near the mouth of the Mississippi River. The dead zone occurs annually when fertilizers, from farm fields in the Midwest, wash down the Mississippi river.

Improper storage and use of automotive fluids produce common organic chemicals causing water pollution. These chemicals include methanol and ethanol (present in wiper fluid); gasoline and oil compounds such as octane, nonane (overfilling of gasoline tanks); most of these are considered non-point sources since their pathway to watercourses is mainly overland flow.

However, leaking underground and above ground storage tanks can be considered point sources for some of these chemicals, and even more toxic organic compounds such as perchloroethylene. Grease and fats (such as lubrication and restaurant effluent) can be either point or non-point sources depending upon whether the restaurant releases grease into the wastewater collection system (point source) or disposes of such organics on the exterior ground surface or transports to large landfills.

The most significant **physical pollutant** is excess sediment in runoff from agricultural plots, clear-cut forests, improperly graded slopes, urban streets, and other poorly managed lands, especially when steep slopes or lands near streams are involved. Other **physical pollutants** include a variety of plastic refuse products such as packaging materials; the most pernicious of these items are ring shaped objects that can trap or strangle fish and other aquatic fauna (**Figure 8.14**). Other common physical objects are timber slash debris, waste paper and cardboard. Finally, power plants and other industrial facilities that use natural water bodies for cooling are the main sources of thermal pollution.

Groundwater can also become contaminated from both natural and anthropogenic sources of pollution. Naturally occurring contaminants are present in the rocks and sediments. As groundwater flows through sediments, metals such as iron and manganese are dissolved and may later be found in high concentrations in the water. Industrial discharges, urban activities, agriculture, groundwater withdrawal, and disposal of waste all can affect groundwater quality. Contaminants from leaking fuel tanks or fuel or toxic chemical spills may enter the groundwater and contaminate the aquifer. Pesticides and fertilizers applied to lawns and crops can accumulate and migrate to the water table.

Leakage from septic tanks and/or waste-disposal sites also can contaminate ground water. A septic tank can introduce bacteria to the water, and pesticides and fertilizers that seep into farmed soil can eventually end up in water drawn from a well. Or, a well might have been placed in land that was once used as a garbage or chemical dump site.

Water Management

Pollution control begins with testing and monitoring of water quality. Water quality is usually monitored using easy to measure indicators such as pH, specific conductance (commonly referred to as conductivity), temperature, fecal and total coliform bacteria, dissolved oxygen, macroinvertebrates, and algae. Polluted sites typically have reduced DO levels, lower pH (more acidic), higher nutrient levels, more bacteria, and higher temperatures compared to less impacted or pristine sites.

Non-point source control relates mostly to land management practices in the fields of agriculture, mining and urban design and sanitation. Agricultural practices leading to the greatest improvement of sediment control include: contour grading, avoidance of bare soils in rainy and windy conditions, polyculture farming resulting in greater vegetative cover, and increasing fallow periods. Minimization of fertilizer, pesticide and herbicide runoff is best accomplished by reducing the quantities of these materials, as well as applying fertilizers during periods of low precipitation. Other techniques include avoiding of highly water soluble pesticides and herbicides, and use of materials that have the most rapid decay times to benign substances.

The main water pollutants associated with mines and quarries are aqueous slurries of minute rock particles, which result from rainfall scouring exposed soils and also from rock washing and grading activities. Runoff from metal mines and ore recovery plants is typically contaminated by the minerals present in the native rock formations. Control of this runoff is

chiefly achieved by preventing rapid runoff and designing mining operations that avoid tailings either on steep slopes or near streams.

In the case of urban stormwater control, good urban planning and design can minimize stormwater runoff. By reducing impermeable surfaces (pavement that doesn't allow water through), then cities can reduce the amount of surface water runoff the carries pollutants into surface water and causes flooding. Additionally, the use of native plant and xeriscape techniques reduces water use and water runoff, and minimizes the need for pesticides and nutrients. Regarding street maintenance, a periodic use of street sweeping can reduce the sediment, chemical and rubbish load into the storm sewer system

The two common approaches to water management fall under either voluntary programs or the regulatory program. The regulatory approach has been very successful in controlling and reducing point source pollution, which was the focus of regulations when they were first introduced. Voluntary programs, together with new amendments to regulations, have had great success in increasing conservation and reducing diffuse nonpoint source pollution. One of the most widely used voluntary programs is **Watershed Management** while the regulatory approach is centered on the Clean Water Act (CWA).

Watershed Management

The watershed management approach recognizes that water contamination problems are complex and not localized to a section of a river. Water pollution problems are caused by multiple activities within the watershed and, therefore, require holistic approaches in the entire **watershed**. A **watershed** (drainage basin or catchment) is an area of land that drains to a single outlet and is separated from other watersheds by a drainage divide. Rainfall that falls in a watershed will generate runoff (if not trapped or infiltrated into groundwater) to that watershed's outlet. Topographic elevation is used to define a watershed boundary. A focal point of water management plans is the Best Management Practices (BMPs) section. BMPs are designed to consider all of the various uses of water, maximize conservation and minimize pollution.

The regulatory approach

Water management through policy and laws seeks to clean up polluted water, prevent further pollution and apply punitive measures for polluters. In the US water-related regulations go as far back as 1899 with the Rivers and Harbors Act, also known as the Refuse Act that prohibited the dumping of solid waste and obstruction of waterways. This regulation, however, did not include waste flowing from streets and sewers. In 1948 another regulation, the Federal Water Pollution Act (which is the basis of the Clean Water Act) was enacted. This regulation covered contamination from sewage outfalls. It was created to reduce contamination of both interstate groundwater and surface waters. Through this regulation funding was made available to states and local governments for water quality management.

One of the major water-related regulations in the US is the Clean Water Act (CWA) of 1972. The regulation was very comprehensive with lots of programs and empowered the Environmental Protection Agency (EPA) to create goals, and objective laws for its implementation. The legislation has programs for both point and nonpoint source pollution. One other major piece of regulation governing water was the 1974 Safe Drinking Water Act (SDWA).

In 1974, amended in 1986, the SDWA was enacted to establish standards for many chemical constituents for public water supplied by public water agencies. In the regulations, maximum contaminant level goals (MCLG), which are non-enforceable and maximum

contaminant levels (MCLs) that are enforceable where created. MCLG are what would be ideal and desirable while MCL are what should be attained in any drinking water supplied by a public municipal agency. For any carcinogen, the MCLG is 0 even though many contaminants have MCLs and detection limits in the parts per billion (ppb) range. Some of them (e.g. dioxin) have MCLs in the parts per trillion (ppt). To give you a sense of how small this ppt is, it is the same as 0.4 mm divided by the distance to the moon.

A Closer Look at the Clean Water Act

The 1972 Clean Water Acts was an overhaul of the 1948 Federal Pollution Control Act. The current regulation includes numerous programs for water quality improvement and protection. The EPA works with its federal, state and tribal regulatory partners to monitor and ensure compliance with clean water laws and regulations in order to protect human health and the environment. The Clean Water Act is the primary federal law governing water pollution. One of the objectives of the CWA was to restore and maintain the integrity of the nation's physical, chemical, and biological waters quality. The ultimate goals of the act are to establish zero pollutant discharge, as well as fishable & swimmable waters in the country. One main component of the CWA is regulations on industrial and municipal discharges into navigable US waters. The act is designed to be a partnership between states and the federal government. The federal government sets the agenda and standards while the state carries out the implementation of the law. States also have the power to set standards that are more stringent than the federal standards if needed. Under the CWA, discharge into US waters is only legal if authorized by a permit. Perpetrators of the law can be punished using administrative, civil, or criminal charges. The second component of the act is providing funding for constructing municipal waste water treatment plants and other projects to improve water quality (Title II and Title VI).

The act covers both point sources (discharge from sources such as pipes) and nonpoint sources (pollution from diffuse sources such as stormwater runoff). Point sources are explicitly covered under section 402, National Pollutant Discharge Elimination System (NPDES). This section requires industries and municipalities to get permits from the EPA before discharging into US waters. The permits require the use of control technology to reduce and prevent pollution.

Water in Crisis (case studies)

- You instructor will assign you a specific case study for the course if needed.

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10.B. **Requests for Future Agenda Items**

This agenda item is for the Governing Board to have a running record of potential items to be placed on future agendas. There will be no discussion on the substance, merits, or issues relating to the proposed agenda item.

10.C. **Upcoming Meetings and Events Calendar**

- Kindergarten Promotion - May 19, 2026; 7:00 p.m. (HS Auditorium)
- 8th Grade Promotion - May 20, 2026; 7:30 p.m. (HS Auditorium)
- High School Graduation - May 21, 7:00 p.m. (HS Auditorium
- Next Regular Board Meeting - June 14, 2026; 6:00 p.m.

11. **ADJOURNMENT**