

AP Environmental Science

Syllabus

Course Overview

The AP Environmental Science course is designed to be the equivalent of a one-semester, introductory college course in environmental science. Unlike most other introductory-level college science courses, environmental science is offered from a wide variety of departments, including geology, biology, environmental studies, environmental science, chemistry, and geography. Depending on the department offering the course, different emphases are placed on various topics. Some courses are rigorous science courses that stress scientific principles and analysis and that often include a laboratory component; other courses emphasize the study of environmental issues from a sociological or political perspective rather than a scientific one.

The AP Environmental Science course has been developed to be most like the former; as such, it is intended to enable students to undertake, as first-year college students, a more advanced study of topics in environmental science or, alternatively, to fulfill a basic requirement for a laboratory science and thus free time for taking other courses.

The AP Course Description and AP Exam have been prepared by environmental scientists and educators who serve as members of the AP Environmental Science Development Committee. In both breadth and level of detail, the content of the course reflects what is found in many introductory college courses in environmental science. The exam is representative of such a course and therefore is considered appropriate for the measurement of skills and knowledge in the field of environmental science.

The goal of the AP Environmental Science course is to provide students with the scientific principles, concepts, and methodologies required to understand the interrelationships of the natural world, to identify and analyze environmental problems both natural and human-made, to evaluate the relative risks associated with these problems, and to examine alternative solutions for resolving or preventing them.

Environmental science is interdisciplinary; it embraces a wide variety of topics from different areas of study. Yet there are several major unifying constructs, or themes, that cut across the many topics included in the study of environmental science. The following themes provide a foundation for the structure of the AP Environmental Science course.

Students are encouraged throughout the course to consider scientific principles and disciplines when completing activities and laboratory exercises throughout the year. These labs will include interpreting and analyzing given and/or experimental data.

APES is interdisciplinary and incorporates a wide variety of topics from many different areas of study. There are several major unifying themes, or big ideas, that cut across the topics within APES. The following big ideas provide the foundation for the structure of the APES course: *The big ideas are labeled per unit in the topic outline.*

- Big Idea 1: Energy Transfer (ENG)
- Big Idea 2: Interactions Between Earth Systems (ERT)
- Big Idea 3: Interactions Between Different Species and the Environment (EIN)
- Big Idea 4: Sustainability (STB)

The units within the APES course with corresponding exam weighting are as follows:

Unit 1: The Living World: Ecosystems	6–8%
Unit 2: The Living World: Biodiversity	6–8%
Unit 3: Populations	10–15%
Unit 4: Earth Systems and Resources	10–15%
Unit 5: Land and Water Use	10–15%
Unit 6: Energy Resources and Consumption	10–15%
Unit 7: Atmospheric Pollution	7–10%
Unit 8: Aquatic and Terrestrial Pollution	7–10%
Unit 9: Global Change	15–20%

In order for students to immerse themselves in the big ideas and content of the APES course, they will apply several major scientific skills and practices that allow them to engage in authentic scientific inquiry. The following scientific processes provide the foundation for the exploration of the APES course:

- Science Practice 1: Concept Application
- Science Practice 2: Visual Representations
- Science Practice 3: Text Analysis
- Science Practice 4: Scientific Experiments
- Science Practice 5: Data Analysis
- Science Practice 6: Mathematical Routines
- Science Practice 7: Environmental Solutions

Student Practice

Throughout each unit, Topic Questions will be provided to help students check their understanding. The Topic Questions are especially useful for confirming understanding of difficult or foundational topics before moving on to new content or skills that build upon prior topics. Topic Questions can be assigned before, during, or after a lesson, and as in-class work or homework. Students will get rationales for each Topic Question that will help them understand why an answer is correct or incorrect, and their results will reveal misunderstandings to help them target the content and skills needed for additional practice.

At the end of each unit or at key points within a unit, Personal Progress Checks will be provided in class or as homework assignments in AP Classroom. Students will get a personal report with feedback on every topic, skill, and question that they can use to chart their progress, and their results will come with rationales that explain every question's answer. Class time is set aside to re-teach skills based on the results of the Personal Progress Check

Textbook

Friedland, Andrew and Rick Relyea. *Environmental Science for the AP® Course*. 2nd ed., Bedford, Freeman, and Worth, 2015.

Legislation and Policies

Key environmental legislation and policies covered in this course.

Clean Air Act

Clean Water Act

Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)

Montreal Protocol

Kyoto Protocol

Endangered Species Act

Safe Drinking Water Act (SDWA)

Delaney Clause of Food, Drug and Cosmetic Act

Resource Conservation and Recovery Act (RCRA)

Course and Topic Outline

This course will be taught in a full year. Students attend 5, 80 minute classes in a two week period. A minimum of 25% of instructional time is devoted to laboratory investigation and/or fieldwork. There are nine units in the course, each lasting approximately two to three weeks. Two weeks will be allotted for test preparation, with additional laboratory time and study for the time period after the AP Exam.

Unit 1: The Living World-Ecosystems (Big Ideas: ENG, ERT,EIN) % of test 6-8 / Time 2-3 weeks

CF Unit/Topic	Curriculum Framework Topic Title	Friedland/Relyea 2E Chapter/Module	Skill Pairing
1.1	Introduction to Ecosystems	Chapter 1, Modules 1-2; Chapter 6, Module 20	1.A
1.2	Terrestrial Biomes	Chapter 4, Module 12	1.B
1.3	Aquatic Biomes	Chapter 4, Module 13	1.B
1.4	The Carbon Cycle	Chapter 3, Module 7	2.B
1.5	The Nitrogen Cycle	Chapter 3, Module 7	2.B
1.6	The Phosphorus Cycle	Chapter 3, Module 7	2.B

1.7	The Hydrologic (Water) Cycle	Chapter 3, Module 7	2.B
1.8	Primary Productivity	Chapter 3, Module 6	1.A
1.9	Trophic Levels	Chapter 3, Module 6	1.B
1.10	Energy Flow and the 10% Rule	Chapter 3, Module 6	6.C
1.11	Food Chains and Food Webs	Chapter 3, Module 6; Chapter 6, Module 20	2.A

Complete **Personal Progress Check MCQ** for Unit 1.

Complete **Personal Progress Check FRQ** for Unit 1.

Take **Unit 1 Test**.

Unit 2: The Living World—Biodiversity (Big Ideas: ENG, ERT,EIN) % of test 6-8 / Time 2-3 weeks

CF Unit/Topic	Curriculum Framework Topic Title	Friedland/Relyea 2E Chapter/Module	Skill Pairing
2.1	Introduction to Biodiversity	Chapter 1, Modules 1 and 2; Chapter 3, Module 8; Chapter 5, Modules 14-15 and 17	1.A
2.2	Ecosystem Services*	Chapter 10, Module 29; Chapter 18, Module 59; Chapter 20, Module 65	1.B
2.3	Island Biogeography	Chapter 6, Module 21	1.A
2.4	Ecological Tolerance	Chapter 5, Module 17	3.A
2.5	Natural Disruptions to Ecosystems	Chapter 3, Module 8; Chapter 18, Module 61; Chapter 19, Module 63	5.A
2.6	Adaptations	Chapter 5, Module 15	5.B
2.7	Ecological Succession	Chapter 6, Module 21; Chapter 14, Module 41	5.C

Complete **Personal Progress Check MCQ** for Unit 2.

Complete **Personal Progress Check FRQ** for Unit 2.

Take **Unit 2 Test**.

Unit 3: Populations. (Big Ideas: ERT,EIN) % of test 10-15% / Time 2 weeks

CF Unit/Topic	Curriculum Framework Topic Title	Friedland/Relyea 2E Chapter/Module	Skill Pairing
3.1	Generalist and Specialist Species	Chapter 5, Module 17	1.B
3.2	<i>K</i> -Selected <i>r</i> -Selected Species	Chapter 6, Module 19	5.A
3.3	Survivorship Curves	Chapter 6, Module 19	5.C
3.4	Carrying Capacity	Chapter 6, Module 18	5.E
3.5	Population Growth and Resource Availability	Chapter 6, Module 18	6.B
3.6	Age Structure Diagrams	Chapter 7, Module 22	5.C
3.7	Total Fertility Rate	Chapter 7, Module 22; Chapter 11, Module 31	5.A
3.8	Human Population Dynamics	Chapter 7, Modules 22 and 23; Chapter 11, Module 31	7.A
3.9	Demographic Transition	Chapter 7, Module 23	1.C

Complete Personal Progress Check MCQ for Unit 3.

Complete Personal Progress Check FRQ for Unit 3.

Take Unit 3 Test

Unit 4: Earth Systems and Resources. (Big Ideas: ENG, ERT) % of test 10-15% / Time 2-3 weeks

CF Unit/Topic	Curriculum Framework Topic Title	Friedland/Relyea 2E Chapter/Module	Skill Pairing
4.1	Plate Tectonics	Chapter 8, Module 24	2.C
4.2	Soil Formation and Erosion	Chapter 8, Module 25; Chapter 11, Module 33	4.B

4.3	Soil Composition and Properties	Chapter 8, Module 25	4.C
4.4	Earth's Atmosphere	Chapter 4, Module 9	2.A
4.5	Global Wind Patterns	Chapter 4, Module 10	2.B
4.6	Watersheds	Chapter 3, Module 8	1.C
4.7	Solar Radiation and Earth's Seasons	Chapter 4, Module 9	2.A
4.8	Earth's Geography and Climate	Chapter 4, Module 10	2.B
4.9	El Niño and La Niña	Chapter 4, Module 11	7.A

Complete **Personal Progress Check MCQ** for Unit 4.
 Complete **Personal Progress Check FRQ** for Unit 4.
 Take **Unit 4 Test**.

Unit 5: Land and Water Use (Big Ideas: STB,EIN). % of test 10-15% / Time 2-3 weeks

CF Unit/Topic	Curriculum Framework Topic Title	Friedland/Relyea 2E Chapter/Module	Skill Pairing
5.1	The Tragedy of the Commons	Chapter 10, Module 29; Chapter 20, Module 65	1.B
5.2	Clear Cutting	Chapter 10, Module 30	1.A
5.3	The Green Revolution	Chapter 11, Module 32	3.B
5.4	Impacts of Agricultural Practices	Chapter 11, Module 32	1.A
5.5	Irrigation Methods	Chapter 9, Module 28; Chapter 11, Module 32	7.C
5.6	Pest Control Methods	Chapter 11, Module 32	7.E
5.7	Meat Production Methods	Chapter 11, Module 32	5.E
5.8	Impacts of Overfishing	Chapter 11, Module 32; Chapter 18, Module 60	7.B
5.9	Impacts of Mining	Chapter 8, Module 25	7.E
5.10	Impacts of Urbanization	Chapter 7, Module 23; Chapter 9, Module 26;	7.C
5.11	Ecological Footprints	Chapter 1, Module 2	5.E

5.12	Introduction to Sustainability	Chapter 1, Module 2; Chapter 10, Module 29; Chapter 11, Module 33; Chapter 13, Module 37; Chapter 20, Module 66	5.E
5.13	Methods to Reduce Urban Runoff	Chapter 3, Module 7; Chapter 10, Module 29	4.B
5.14	Integrated Pest Management	Chapter 11, Module 33	7.D
5.15	Sustainable Agriculture	Chapter 11, Module 33	7.E
5.16	Aquaculture	Chapter 11, Modules 32 and 33	7.C
5.17	Sustainable Forestry	Chapter 10, Module 29	7.F

Complete **Personal Progress Check MCQ Part B** for Unit 5.
 Complete **Personal Progress Check FRQ** for Unit 5.
 Take **Unit 5 Test**.

Unit 6: Energy Resources and Consumption. (Big Ideas: ENG). % of test 10-15% / Time 2-3 weeks

CF Unit/Topic	Curriculum Framework Topic Title	Friedland/Relyea 2E Chapter/Module	Skill pairing
6.1	Renewable and Nonrenewable Resources	Chapter 12, Module 34; Chapter 13, Module 40	1.C
6.2	Global Energy Consumption	Chapter 12, Modules 34 and 35; Chapter 13, Module 37	6.C
6.3	Fuel Types and Uses	Chapter 12, Modules 35 and 35	1.A
6.4	Distribution of Natural Energy Resources	Chapter 12, Modules 35 and 36	2.B
6.5	Fossil Fuels	Chapter 12, Modules 35 and 36	7.A
6.6	Nuclear Power	Chapter 12, Module 36	2.B
6.7	Energy from Biomass	Chapter 13, Module 38	7.B
6.8	Solar Energy	Chapter 13, Module 39	5.C

6.9	Hydroelectric Power	Chapter 9, Module 27; Chapter 13, Module 38	7.F
6.10	Geothermal Energy	Chapter 13, Module 39	1.B
6.11	Hydrogen Fuel Cell	Chapter 13, Module 39	1.C
6.12	Wind Energy	Chapter 13, Module 39	7.B
6.13	Energy Conservation	Chapter 12, Module 34; Chapter 13, Modules 37 and 40	6.C

Complete Personal Progress Check MCQ Part A for Unit 6.
 Complete Personal Progress Check MCQ Part B for Unit 6.
 Complete Personal Progress Check FRQ for Unit 6.
 Take Unit 6 Test.

Unit 7: Atmospheric Pollution. (Big Ideas: STB) % of test 7-10% / Time 2 weeks

CF Unit/Topic	Curriculum Framework Topic Title	Friedland/Relyea 2E Chapter/Module	Skills Pairing
7.1	Introduction to Air Pollution	Chapter 12, Module 35; Chapter 15, Module 46	4.E
7.2	Photochemical Smog	Chapter 15, Modules 47-48	5.B
7.3	Thermal Inversion	Chapter 15, Module 47	2.C
7.4	Atmospheric CO ₂ and Particulates	Chapter 15, Module 46	4.C
7.5	Indoor Air Pollutants	Chapter 15, Module 50	5.C
7.6	Reduction of Air Pollutants	Chapter 15, Module 48	7.D
7.7	Acid Rain	Chapter 15, Module 47	4.B
7.8	Noise Pollution	Chapter 14, Module 44	3.C

Complete **Personal Progress Check MCQ** for Unit 7.
 Complete **Personal Progress Check FRQ** for Unit 7.
 Take **Unit 7 Test**.

Unit 8: Aquatic and Terrestrial Pollution. (Big Ideas: ENG, STB) % of test 7-10% / Time 2-3 weeks

CF Unit/Topic	Curriculum Framework Topic Title	Friedland & Relyea 2E Chapter/Module	Skill Pairing
8.1	Sources of Pollution	Chapter 14, Modules 41-43; Chapter 17, Module 57	1.A
8.2	Human Impacts on Ecosystems	Chapter 8, Module 25; Chapter 14, Modules 41-44; Chapter 16, Modules 51-54; Chapter 17, Module 57; Chapter 18, Module 60	6.B
8.3	Endocrine Disruptors	Chapter 14, Modules 42, 44; Chapter 17, Module 57	1.A
8.4	Human Impacts on Wetlands and Mangroves	Chapter 4, Module 13; Chapter 18, Module 60	7.B
8.5	Eutrophication	Chapter 14, Module 41	2.C
8.6	Thermal Pollution	Chapter 14, Module 44	1.C
8.7	Persistent Organic Pollutants (POPs)	Chapter 17, Module 57	1.B
8.8	Bioaccumulation and Biomagnification	Chapter 17, Module 57	4.A
8.9	Solid Waste Disposal	Chapter 14, Module 44; Chapter 16, Modules 51-54	7.D
8.10	Waste Reduction Methods	Chapter 16, Modules 52-55	6.B
8.11	Sewage Treatment	Chapter 14, Module 41	2.A
8.12	Lethal Dose 50% (LD ₅₀)	Chapter 17, Module 57	6.A
8.13	Dose Response Curve	Chapter 17, Module 57	5.E
8.14	Pollution and Human Health	Chapter 14, Module 41; Chapter 15, Modules 46-47; Chapter 17, Modules 56, 58	4.C
8.15	Pathogens and Infectious Diseases	Chapter 17, Module 56; Chapter 19, Module 64	6.A

Complete **Personal Progress Check MCQ Part A** for Unit 8
 Complete **Personal Progress Check MCQ Part B** for Unit 8.
 Complete **Personal Progress Check FRQ** for Unit 8.
 Take **Unit 8 Test**.

Unit 9: Global Change. (Big Ideas: STB, EIN). % of test 15-20% / Time 2-3 weeks

CF Unit/Topic	Curriculum Framework Topic Title	Friedland & Relyea 2E Chapter/Module	Skill Pairing
9.1	Stratospheric Ozone Depletion	Chapter 15, Module 49	1.A
9.2	Reducing Ozone Depletion	Chapter 15, Module 49; Chapter 19, Module 62	7.B
9.3	The Greenhouse Effect	Chapter 19, Module 62	1.B
9.4	Increases in The Greenhouse Gases	Chapter 1, Module 2; Chapter 3, Module 7; Chapter 12, Module 35; Chapter 13, Module 38; Chapter 15, Module 46; Chapter 19, Modules 62-63	2.C
9.5	Global Climate Change	Chapter 4, Module 11; Chapter 19, Modules 62-64	5.D
9.6	Ocean Warming	Chapter 4, Module 11; Chapter 19, Module 64	7.A
9.7	Ocean Acidification	Chapter 19, Module 63	1.C
9.8	Invasive Species	Chapter 18, Module 60	7.E
9.9	Endangered Species	Chapter 10, Module 30; Chapter 18, Modules 59, 61	7.D
9.10	Human Impacts on Biodiversity	Chapter 1, Module 1; Chapter 4, Modules 12-13; Chapter 18, Modules 59-61	7.C

Complete **Personal Progress Check MCQ** for Unit 9.
 Complete **Personal Progress Check FRQ** for Unit 9.
 Take **Unit 9 Test**.

Labs and Activities

Labs are conducted at least two to three times per unit. Some labs require individual research and data gathering and others have groups of 3–4 students work together. Ongoing field studies and long-term projects are incorporated into lab time. Lab Notebook format for lab reports include: Title, Introduction, Problem Statement, Methods, Data, Findings, and Conclusions.

Topics with associated activities are listed below. Items related to discussions, direct instruction and smaller activities are not included.

Unit 1: The Living World: Ecosystems

Food Web Activity

Students will examine the interaction between animal and plant species in the Sierra Nevada Mountains. The interaction takes place in the way of food webs and food chains. Some species are producers, some are consumers, and some fulfill other roles. Objectives: To understand the roles that animals and plants play in food webs. To be able to draw and label an accurate food web with multiple food chains. To understand what would happen if some part of a chain were disrupted. *Science Practice 2: Visual Representations*

4 Cycles Combined Drawing

After reviewing the Carbon, Nitrogen, Phosphorus and Water Cycles draw a complete picture with all four cycles and how they are intertwined. *Science Practice 2: Visual Representations*

Unit 2: The Living World: Biodiversity

HHMI Lizard Evolution Virtual Lab

The Introduction to this lab poses two questions: Why are there so many species of anoles? And how did they evolve?

Students learn to carefully measure specific traits to determine the range of differences among different species of anoles and start to think about whether and how the differences might represent adaptations resulting from natural selection. DNA sequence analysis can provide information about the evolutionary relationships among species irrespective of their phenotypic differences or similarities. At the end of the module, students should discover that populations adapt in similar ways to similar environmental conditions, a process known as convergent evolution. This means that on different islands speciation can follow predictable and repeatable evolutionary patterns.

Students learn that differences in traits can evolve as adaptations to different habitats and start to think about how such differences can lead to the evolution of different species. This module reveals that whereas research in evolution typically involves making observations of past events, researchers can conduct experiments that test predictions about how organisms adapt to changes in the environment. Students learn that for speciation to occur, there has to be a mechanism that keeps members of one species from mating with members of another species—in this case, reproductive isolation. *Science Practice 1: Concept Application Science Practice 4: Scientific Experiments*

Science Practice 5: Data Analysis

Unit 3: Populations

World Population and Population Pyramids Lab

Learn how to read population pyramids and how to research information about the population differences between developing and developed nations. Understand demographic indicators, such as population growth rate, TFR,IMR, life expectancy and migration, and how these factors affect demographic transition. *Science Practice 1: Concept Application Science Practice 2: Visual Representations Science Practice 4: Scientific Experiments Science Practice 5: Data Analysis Science Practice 6: Mathematical Routines*

Survivorship Curve

Demographics from local cemeteries can be used, but in order to get a broader scope of life in the US, the world wide web can be used to gather data about birth and death rates all over the country. Many cemeteries now have databases that list all individuals buried there. This is a much faster way than visiting all cemeteries in an area and making assumptions about the overall US population. Objectives: Once :Some of the basic concepts of population demography. How factors such as advances in medicine and environmental protection may have affected human demography over the past 150 years. How human demography might change in the future, based on the current socio-political reality and the presence of incurable diseases (such as AIDS). Students collect data from local cemeteries and produce survivorship curve graphs. *Science Practice 1: Concept Application Science Practice 4: Scientific Experiments Science Practice 5: Data Analysis Science Practice 6: Mathematical Routines*

Demographer

This activity asks students to compare demographic data between the United States, Japan, Kenya, and India. It will help students build graphing and analysis skills, and increase familiarity with vocabulary related to demography. *Science Practice 2: Visual Representations Science Practice 5: Data Analysis Science Practice 6: Mathematical Routines*

Demographic Transition

This activity will help students understand the three curves on the demographic transition model. After drawing graphs, students will use descriptive cards to distinguish characteristics of each phase of the demographic transition model. *Science Practice 2: Visual Representations Science Practice 5: Data Analysis*

Unit 4: Earth Systems and Resources

Biome Lab/ with climatogram

Student compare average temperatures and average precipitation of terrestrial biomes. Students create at least 2 climatograms while also comparing organisms that survive in those biomes. *Science Practice 2: Visual Representations Science Practice 5: Data Analysis*

Unit 5: Land and Water Use

Pros and Cons of Dams and Dams their use and removal

Students read various articles about the creation and removal of dams in the United States and around the world. Students then are involved in discussions/debate over dams and use data to support their stand in the pros and cons of dams, and possible solutions and alternatives.

Science Practice 3: Text Analysis Science Practice 7: Environmental Solutions

Online water usage quizzes

Students take online quizzes about their water use and how to use less water and to also use wiser water practices. *Science Practice 7: Environmental Solutions*

Unit 6: Energy Resources and Consumption

Annenberg learner The Habitable Planet: A Systems Approach to Environmental Science

In today's world, with populations and economies booming, the demand for energy is rising. A portfolio of energy sources is used to meet this demand. Because there is no perfectly clean, safe, and inexpensive source of energy, the makeup of this portfolio involves tradeoffs of safety, cost, and—of increasing concern—emissions of greenhouse gases such as CO₂. In this lab, your challenge is to try to meet the world's projected energy demand by choosing from the available energy sources, while keeping atmospheric CO₂ under control and avoiding the particular limits and pitfalls associated with each energy source. *Science Practice 1: Concept Application*

Science Practice 2: Visual Representations Science Practice 4: Scientific Experiments

Science Practice 5: Data Analysis Science Practice 6: Mathematical Routines Science Practice 7: Environmental Solutions

Unit 7: Atmospheric Pollution

CO₂ of the Pacific

Student compare CO₂ data form 6 collection stations around the Pacific. Student graph and compare the data given.

Science Practice 2: Visual Representations Science Practice 5: Data Analysis Science Practice 6: Mathematical Routines

Unit 8: Aquatic and Terrestrial Pollution

Oil Spills

Students research oil spills and create an infographic about the impact from the spills.

Science Practice 2: Visual Representations Science Practice 3: Text Analysis

Unit 9: Global Change

Climate Change Lab

Students, using 2 liter bottles create various climates, to have students observe the greenhouse effect and analyze its effect on Earth. *Science Practice 4: Scientific Experiments Science Practice 5: Data Analysis*

Final Project

Is Solar Power Right for Our District.

Students will investigate the districts power use per building and the feasibility for the district to add solar panels to building as a cost saving measure for our utility bills. Upon completion students will be presenting their findings to adults (other than the teacher) within the district administration or school board.

Science Practice 1: Concept Application Science Practice 2: Visual Representations

Science Practice 4: Scientific Experiments. Science Practice 5: Data Analysis

Science Practice 6: Mathematical Routines Science Practice 7: Environmental Solutions

Post AP Exam

Soil Study

Students will determine whether abiotic conditions of the soil affect the number and type of organisms living in the soil. The specific abiotic conditions we will test will be particle size, moisture content, and % of organic matter in soil. We will collect the living things using a Berlese funnel. *Science Practice 4: Scientific Experiments Science Practice 5: Data Analysis*

Stream Study

Students will perform a stream study on a stream near the school. Students will collect information including but not limited to flow, clarity, bank vegetation, and other biotic and abiotic characteristics of a stream. Upon completion students will compare data to both current and past data points to determine stream health. Students will also give possible solutions to help keep the stream healthy. *Science Practice 4: Scientific Experiments Science Practice 5: Data Analysis Science Practice 6: Mathematical Routines Science Practice 7: Environmental Solutions*



APES Summer Work²¹⁻²²



Email Questions to drevesr@sbsd.org

Before school ends work. GRADED

1. In Canvas take the prerequisite survey. In April work in 21 module.
2. In Canvas take the Academic Honesty “quiz” In April work in 21 module.
3. Take the book survey. When you get a book, the current class is not done with them to be able to pass them out now. When the books become available I will email you so, you can pick one up. In school student will stop by my room (128) to pick one up. Virtual students I will leave one at the front desk for you with your name on it.

Summer Work. The answers to the questions go into a quiz on canvas. Be careful the questions are just numbered with no questions. The quizzes follow the worksheet. All book work will be in the assignment category

1. Read Chapter 6 mods 18-21.

Answer questions

Mod 18 1-5 }
 Mod 19 1-5 } One Quiz
 Mod 20 1-5 }
 Mod 21 1-5 }

End of Chapter 6 questions 1-12 and **ONLY** Free Response #2 }
 One Quiz for MC
 One Quiz for
 Free Response

2. Read Chapter 7 Mods 22 and 23 } One Quiz

Answer questions

Mod 22 1-5 }
 Mod 23 1-5 } One Quiz

End of Chapter 7 questions 1-12 and **ONLY** Free Response #1 }
 One Quiz for MC
 One Quiz for
 Free Response

3. Lab Ch7 Demography – Human Population Ecology

Data can be collected with others but everyone needs to do **their own** lab. Please turn this in as a lab. The format is up to you. DO NOT simply fill out the sheet and submit that.

4. Laws and Act Activity. This will go into the labs/project category.

!!!!All Work is **DUE AUG 16 (Time stamps of Aug 17 or later are late.)**!!!!!!
This is the first day of fall preseason

APES Ch 6 Answer Sheet.

This is for your notes, these are to be entered into canvas.

APES CH 6.18 & 6.19

Chapter 6 Mod 18

- 1 _____
- 2 _____
- 3 _____
- 4 _____
- 5 _____

Chapter 6 Mod 19

- 1 _____
- 2 _____
- 3 _____
- 4 _____
- 5 _____

Chapter 6 Mod 20

- 1 _____
- 2 _____
- 3 _____
- 4 _____
- 5 _____

Chapter 6 Mod 21

- 1 _____
- 2 _____
- 3 _____
- 4 _____
- 5 _____

APES CH 6.20 & 6.21



Ch 6 End Questions

Chapter 6 End Questions

- 1 _____
- 2 _____
- 3 _____
- 4 _____
- 5 _____
- 6 _____
- 7 _____
- 8 _____
- 9 _____
- 10 _____
- 11 _____
- 12 _____

Do not forget to do the free response # 2



APES Ch 7 Answer Sheet.

This is for your notes, these are to be entered into canvas.

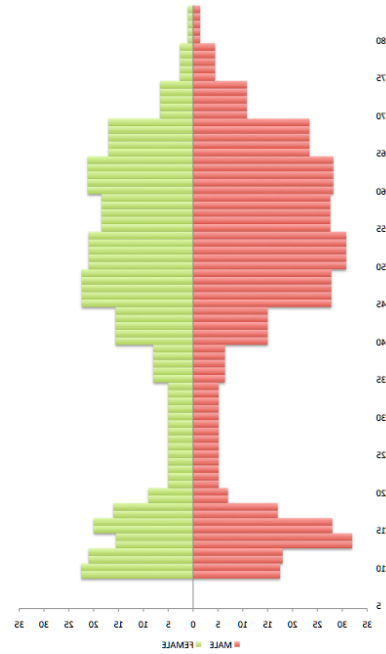
APES CH 7.22 & 7.23

Chapter 7 Mod 22

- 1 _____
- 2 _____
- 3 _____
- 4 _____
- 5 _____

Chapter 7 Mod 23

- 1 _____
- 2 _____
- 3 _____
- 4 _____
- 5 _____



Ch 7 End Questions

Chapter 7 End Questions

- 1 _____
- 2 _____
- 3 _____
- 4 _____
- 5 _____
- 6 _____
- 7 _____
- 8 _____
- 9 _____
- 10 _____
- 11 _____
- 12 _____

Do not forget to do the free response # 1