

AP Environmental Science Syllabus

Course Title: Advanced Placement Environmental Science

Lab Times:

Most labs will be done within the regular class meeting time; however, there will be a few take home labs and field studies required for this course. Field studies will require travel and students miss a full day of school. Students should expect one lab every week.

Course Description:

AP Environmental Science provides an investigative approach to the interrelationships of the natural world through the study of the fundamental concepts, principles, and methodologies of environmental science, with an emphasis on inquiry and critical thinking skills including: problem solving and experimental investigations. Topics of study include: Earth systems and resources, ecosystems and energy flow, population biology, land and water use, energy resources and consumption, pollution, and global change. Laboratory work and field studies are an integral component of this course. Technology including graphing calculators, probe ware, graphing and data analysis software, and environmental sciences apparatus is used throughout this course.

Though our system has an open enrollment policy, students should understand that this course is designed to be a second year environmental science course, and the equivalent of a one semester-long, laboratory-based, introductory, college level environmental science course. The course requires a working knowledge of biology, chemistry and/or physics, and one year of algebra. The breadth, pace and depth of material covered exceeds the standard high school Environmental Science course, as does the college-level textbook, laboratory work, and time and effort required of students. Students are expected to take the AP Environmental Science Exam at the end of this course.

Course Purpose and Goals:

Philosophy

Scientific inquiry is the basis of this course. Scientific inquiry is defined as the diverse ways in which scientists study the natural world and propose explanations based on the evidence derived from their work. Scientific inquiry also refers to the activities through which students develop knowledge and understanding of scientific ideas, as well as an understanding of how scientists study the natural world (NSTA, 2004). This includes active use of the well-designed investigation in which students: 1) form testable questions and hypotheses, 2) design and conduct appropriate investigative procedures, including the identification and control of appropriate variables, 3) organize, display and critically analyze results, 4) draw inferences, summarize results and develop conclusions, and 5) communicate their results for critique by others. Based on the philosophy that scientific knowledge is best acquired through inquiry, the course uses a variety of techniques to promote inquiry in the classroom (ex. multiple revisions, high quality questioning, synthesis, making conclusions based on evidence, etc).

Advanced Placement Environmental Science is an interdisciplinary experience; it embraces a wide variety of topics from different areas of study. Yet, there are several major unifying themes, that cut across the many topics included in the study-- specifically human population growth and development as a primary link between most, if not all, environmental

issues. The goal of APES 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 and/or preventing them.

The goal of the AP Environmental Science course is to provide students with the scientific principles and methodologies required for understanding the interrelationships of the natural world. One of the major objectives for establishing the course was to promote the development of citizens who could make informed decisions concerning environmental issues

Goals

1. To understand the fundamental concepts and principles and methodologies of environmental science as a means to understand the interrelationships of the natural world.
2. To identify, investigate and analyze environmental issues and problems of the natural and man-made world.
3. To evaluate the relative risks of environmental issues and explore their resolution.
4. To develop problem solving skills, through the active asking and answering of testable questions, and employing the components of a well-designed experimental investigation.

Conceptual Organization

This is a fast paced course where students will be required to cover up to one chapter a week. Students will be given daily quizzes on reading material and the previous day lecture material. It is strongly recommended that students spend at least 2 hours of study outside of class for every hour in class.

The students are exposed to the equivalent of a college introductory environmental science course, meaning that the content and level of depth of the material is equivalent to a college level course. As with university courses, it is expected that students will be independent learners. Scientific inquiry is an integral component of this course, the elements of the well-designed investigation and the nature of the scientific methods are taught within the context of the topics, rather than treated as a separate introductory unit. As students investigate phenomena they extend their understanding of forming testable questions and hypotheses. Laboratory techniques are learned in the direct application of their use, rather than as a generic exercise isolated from their setting of application. Methods to collect, organize and display data are taught within the authentic use of real experimental data. This approach of learning uses the investigative skills within and throughout the authentic need of using and applying the skills.

Topics within the course are developed to illustrate the interdisciplinary nature of environmental science, and its wide range of topics from different areas of study. The content and level of depth of the material is equivalent to a college level course. The course content is organized to emphasize the major unifying themes of environmental science. These include: the Earth is an interconnected series of biogeochemical systems, the flow of energy is central to ecological processes, humans impact natural systems and create a cultural and societal context for the understanding, human survival depends upon environmental stewardship, and science is a method of learning about and understanding the environment.

Course Format and Policies:

This school system calculates weighted grades for students who complete and take the requisite exam of an Advanced Placement (AP) Course.

Unweighted Scale A=4	Weighted Scale A=5
Unweighted Scale B=3	Weighted Scale B=4
Unweighted Scale C=2	Weighted Scale C=3
Unweighted Scale D=1	Weighted Scale D=2
Unweighted Scale F=0	Weighted Scale F=0

Grade Break Down

This class DOES NOT utilize weighted grades (for example, homework = 20%, classwork = 30%, etc.). Instead, each assignment will be simply be assigned a point value and put into the gradebook. It is assumed that many assignments will be completed using time both in and outside of class. A general guideline of how many points each type of assignment is worth is as follows:

- Quarter Tests: 200 points each (1 per quarter)
- Chapter Tests: 100 points each (3-ish per quarter)
- Homework assignments: 10-20 points each (1-2x/week)
- Labs: 50-100 points each, depending on the scope of the lab and possibly including a formal lab report (as many as possible)
- Projects, discussions, papers: 50-100 points each, depending on length

Late Work

Late work is accepted but it will receive partial credit

Cheating/Plagiarism

Cheating is a serious offense. This includes copying, allowing others to copy work, using cheat sheets, looking on others paper, etc., and plagiarizing. All parties involved will receive a zero for the entire assignment and school officials and parents will be notified.

Lab Work

Students are required to keep a laboratory journal and/or portfolio, which may be used by a university or college, if a student request credit or advanced placement for this course

Textbook, Materials and Other Resources:

Other Resources

- Laboratory classroom that includes the space, facilities and equipment to conduct hands-on, inquiry-based investigations including but limited to, microscopes, water quality test kits, seines, aquaria, terraria, and computers
- Data gathering, graphing, analysis and presentation software including databases, spreadsheets and probeware interfaces including but not limited to, Vernier Sensors for

ionic compounds and pH, LabPro Interfaces that work with TI-85+ and computers, Venier Sensors for gas and pressure changes.

- Graphing calculators--TI85+ and TI83.

Required Textbook

- Raven, Peter H., and L. R. Berg. 2006, *Environment*, 5th edition. Hoboken, N.J.: John Wiley & Sons.

Supplemental Textbooks and Readings

- Molnar, W (2005). *Laboratory Investigations AP environmental science*. Saddle Brook, New Jersey: The Peoples Publishing Group, Inc.

Videos/DVDs

- Affluenza
- The People Bomb, CNN
- What's Up with the Weather
- A Civil Action
- The Lorax
- And others as found appropriate

Internet access and online resources

- AP College Board Website: <http://apcentral.collegeboard.com/>
- Global Climate Change Website: <http://www.exploratorium.edu/climate/>
- Chem Connections Modules Website: <http://chemistry.Beloit.edu>
- Environmental Literacy Council Website: <http://www.enviroliteracy.org/>
- High Country News Website: <http://www.hcn.org/>
- Population Reference Bureau Website: www.prb.org
- Environmental Protection Agency Website: www.epa.org

Supporting Services

Students are encouraged to use AVID strategies, other school resources and teachers, seminars, and homework club to complete assignments.

Course Content Outline

Quarter 1 Schedule

Week	Chap Raven & Berg	Topic	Pages and Major Assessments
1	1	Introducing Environmental Science and Sustainability	1-21
2	2	History, Laws, Economics and Ethics	22-37 (Test Chap 1 & 2)
3	22	Water Pollution	505-528

4	14	Water Resources	299-323 (Test Chap 22 & 14)
5	6	Aquatic Ecology Aquatic Diversity	127-142 (Test Chap 6)
6	3	Ecosystems and Energy	44-54
7	4	Ecosystems and Living Organisms (Living Together Movie)	62-83 (Test Chap 3 & 4)
8	5	Ecosystems and Physical Environment (Ecosystem in a bottle)	86-94 (Test Chap 5)
9		Review	Quarter 1 Test

Quarter 2 Schedule

Week	Chap Raven & Berg	Topic	Pages and Major Assessments
10	17	Preserving Earth's Biological Diversity	370-382
11	6	Major Ecosystems Throughout the World (Biomes Movie)	116-142 (Chap 17 & 6 Test)
12	7	Human Health and Environmental Toxicology	146-160 (Test Chap 7)
13	8	Population Change	168-188
14	9	Overpopulation (Movie CNN People Bomb)	192-206
15	10	The Urban World	211-225 (Test Chap 9-11)
16	18	Land Resources	398-418
17	19	Food Resources: A Challenge for Agriculture	427-437 (Test Chap 18-19)
18		Semester Exam	

Quarter 3

Week	Chap	Topic	Pages and Major Assessments
19	23	Pesticides	532-545
20-21	24	Solid and Hazardous Wastes (Solid Waste Activity)	555-571 (Test 19-21)
22-23	21	Regional and Global Atmospheric Changes	476-504
23-24	20	Air Pollution & Noise Pollution (Particulate Lab and Class Decibels)	454-468 (Test 22-24)
25	15	Soil Resources	326-347
26	16	Minerals (Mineral Activity)	348-368 (Test)
27		Review	(Quarter Test)

Quarter 4

Week	Chap	Topic	Pages and Major Assessments
28	11	Fossil Fuels Mining Activity and Articles	228-249
29	12	Nuclear Energy and Hydroelectricity	253-268 (Test)
30	13&25	Renewable Energy and Tomorrow's World	275-296 582-594 (Test)
31		AP Review	
32		AP Review	AP EXAM
33-36		Middle of May until the End of School	