ADVANCED PLACEMENT CLASSES

ADVANCED PLACEMENT ENVIRONMENTAL SCIENCE AB

Annual Course—Grades 10–12

Prerequisites: Concurrent enrollment in Algebra 2 AB or equivalent. Previous completion of a college-preparatory science course is recommended.

36-05-07 AP ENVIR SCIENCE
36-15-08 AP ENVIR SCIENCE

Course Description

AP Environmental Science may be taken as an additional course in a sequence of college-preparatory science courses for students who can profit from the enrichment provided. Other students may profit more from taking AP Environmental Science after having taken other high school science courses. This is a college-level course for students eligible for honors classes and may be accepted by colleges for course credit or advanced placement of students who qualify on the Advanced Placement Examination. AP Environmental Science differs significantly from the usual high school course with respect to the kind of textbook used, range and depth of topics covered, the kind of laboratory work done, and the time and effort required of students. School administrators should be aware that an AP college-level laboratory is significantly more expensive to operate than a typical high school laboratory and requires more time than non-laboratory courses. The equivalent of two double periods a week for laboratory work is highly recommended. The AP Environmental Science Development Committee has designated major themes that recur throughout the course. Teachers should emphasize the connections between the themes to assist students in organizing concepts and topics into a coherent conceptual framework. The six themes and their corollaries, which provide a foundation for the structure of the AP Environmental Science course are: science is a process, energy conservation underlies all ecological processes, the Earth can be thought of as one interconnected system, humans can alter natural systems, environmental problems have a social and cultural context, and human survival depends upon developing practices that will result in sustainable systems. **AP Environmental Science AB meets the Grades 9-12 District physical science requirement. It also meets one year of the University of California *'d'* entrance requirement for laboratory science.**

Instructional Units and Pacing Plans

INSTRUCTIONAL UNITS	*SUGGESTED WEEKS	
Scientific Analysis/Observing the Natural World and Developing Hypotheses	2	2
Collecting Data	2	2
Interdependence of Earth's Systems: Fundamental Principles and Concepts of Energy Flow	5	6
The Cycling of Matter	5	6
The Solid Earth	5	6
The Atmosphere	5	6
The Biosphere	5	6
Human Population Dynamics/History and Global Distribution	3	4
Total	***32 year-round**	***38 traditional**

* Suggested weeks are to be used as an estimate only. Advanced Advanced Placement Course Description

for Environmental Science Placement teachers should refer to the most recent *Acorn Book* for a detailed description of the course objectives, performance skills, and topics (instructional units) which will be covered on the Advanced Placement Examination. The *Acorn Book* is published by the College Board (Advanced Placement Program, P.O. Box 6670, Princeton, NJ 08541-6670). The course description is also available on the College Board Website, www.collegeboard.com. The AP Environmental Science Test is normally given during the second or third week in May.

Representative Performance Outcomes and Skills

In accordance with their individual capacity, students will grow in the ability to:

- Demonstrate process skills of scientific thinking: observing, communicating, comparing, ordering, categorizing, relating, inferring, and applying.
- Demonstrate skills in the areas of speaking, listening, writing, reading, graphing, mapping skills, and mathematics.
- Handle safely the equipment and materials common to chemistry laboratory.
- Evaluate the contributions of science and technology and their relevance to improving our daily lives in preparation for the future.
- Establish the relevance of science and its applications to careers and real-life situations.
- Select and use appropriate tools and technology (such as computer-linked probes, spreadsheets, and graphing calculators) to perform tests collect data, analyze relationships, and display data.*
- Identify and communicate sources of unavoidable experimental error.*
- Identify possible reasons for inconsistent results, such as sources of error or uncontrolled conditions.*
- Formulate explanations by using logic and evidence.*
- Solve scientific problems by using quadratic equations and simple trigonometric, exponential, and logarithmic functions.*
- Distinguish between hypothesis and theory as scientific terms.*
- Recognize the usefulness and limitations of models and theories as scientific representations of reality.*
- Read and interpret topographic and geologic maps.*
- Analyze the locations, sequences, or time intervals that are characteristic of natural phenomena (e.g., relative ages of rocks, locations of planets over time, and succession of species in an ecosystem).*
- Recognize the issues of statistical variability and the need for controlled tests.*
- Recognize the cumulative nature of scientific evidence.*
- Analyze situations and solve problems that require combining and applying concepts from more than one area of science.*
- Investigate a science-based societal issue by researching the literature, analyzing data, and communicating the findings. Examples of issues include irradiation of food, cloning of animals by somatic cell nuclear transfer, choice of energy sources, and land and water use decisions in California.*
- Know that when an observation does not agree with an accepted scientific theory, the observation is sometimes mistaken or fraudulent (e.g., the Piltdown Man fossil or unidentified flying objects) and that the theory is sometimes wrong (e.g., the Ptolemaic model of the movement of the Sun, Moon, and planets).*
- Investigate a societal issue by researching literature, analyzing data and communicating findings and discuss possible future outcomes.
- Demonstrate interconnections between the many disciplines of science.
- Demonstrate the interdisciplinary connections between science and other curricular fields.

Assessments
Instruction in our district is assessment-driven. The Framework states "that effective science programs include continual assessment of student's knowledge and understanding, with appropriate adjustments being made during the academic year (p.11)."[1] Assessments can be on demand or over a long period of time. The District Periodic Assessments and STAR State Testing play a significant role in Student Assessments.

The chart below, adapted from *A Guide for Teaching and Learning*, NRC (2000), gives some examples of on demand and over time assessment.

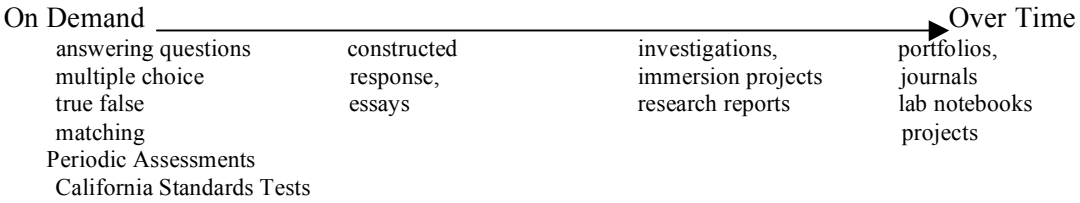

Chart 1 - Assessment Examples

Texts/Materials

- Advanced Placement Course Description for Environmental Science(*Acorn Book)*
- *Science Framework for California Public Schools*
- District Authorized AP Textbooks and ancillary materials:
    - Glencoe/McGraw-Hill, *Environmental Science: A Global Concern*, 9th Ed. Cunningham, et al. 2007
    - Pearson/Prentice Hall, *Environment: The Science Behind the Stories*, 2nd Ed. Withgoth, Brennan 2007
    - Peoples Education/Wiley, *Environmental Science: Earth as a Living Planet*, 6th Ed. Botkin, Keller 2007
    - Peoples Education/Wiley, *Environment*, 5th Ed. Raven, Berg 2006
    - Thomson Learning/ Brooks- Cole, *Living in the Environment: Principles, Connections, and Solutions*, 15th Ed. Miller 2007
- *Science Safety Handbook for California Public Schools*
- Appropriate science laboratory materials