

AP Environmental Science

Syllabus 2012-2013

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Course Description

The AP Environmental Science course is a full-year course 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. The AP Environmental Science course has been developed to be like a rigorous science course that stresses scientific principles and analysis. 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 goal of the 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 the environmental problems both natural and human-made, to evaluate the relative risks associated with these problems, to examine alternative solutions for resolving and/or preventing them, and to develop and focus their own political perspective.

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:

- o Science is a process.
- o Energy conversions underlie all ecological processes.
- o The Earth itself is one interconnected system.
- o Humans alter natural systems.
- o Environmental problems have a cultural and social context.

Text

Environmental Science: Toward a Sustainable Future by Richard T. Wright, 9th Edition, 2005, Pearson/Prentice Hall Publishers

Other Resources

In addition to the textbook, we will draw information from supplemental periodicals, readings/case studies, and the Internet. We will specifically draw readings from the following environmental books:

- *Silent Spring* by Rachel Carson, 2002, Houghton Mifflin Harcourt

- *Devastation and Renewal: An Environmental History of Pittsburgh and Its Region* by Joel A. Tarr, 2003, University of Pittsburgh Press
- *Barron's AP Environmental Science* by Gary Thorpe, 3rd Ed. 2008, Barron's Educational Series, Incorporated
- *The Lorax* by Dr. Seuss, 1971

AP Exam

Each AP course has a corresponding exam that participating schools worldwide administer in May. The AP Environmental Science Exam contains multiple-choice questions and a free-response section (either essay or problem solving). The multiple-choice section, which constitutes 60 percent of the final grade, consists of 100 multiple-choice questions that are designed to cover the extensiveness of the students' knowledge and understanding of environmental science. The free-response section constitutes 40 percent of the final grade and includes 1 data-set question, 1 document-based question, and 2 synthesis and evaluation questions.

The AP Exam is a culminating assessment in this AP course and is thus an integral part of the AP Program. As a result, students are encouraged, but not required, to take the corresponding Environmental Science AP Exam in May.

Course Outline

Unit 1: Earth Systems and Resources **(20 days)**

Chapter 1: Toward a Sustainable Future

- Global Environmental Picture
- Three Strategic Themes: Sustainability, Stewardship, and Sound Science
- Three Integrative Themes: Ecosystem Capital, Policy/Politics, and Globalization

****Lab** → Tragedy of the Commons Lab

****Lab** → *The Lorax*

Chapter 2: Ecosystems – What They Are

- Describing the Structure of Ecosystems
- Biomes
- The Human Factor

****Lab** → *Design a Foodweb*

Chapter 3: Ecosystems – How They Work

- Matter, Energy, and Life
- Energy Flow in Ecosystems
- The Cycling of Matter in Ecosystems

****Lab** → Primary Consumer Energy Flow

****Lab** → Owl Pellet Lab

Chapter 4: Ecosystems – How They Change

- Natural Populations
- Population Equilibrium
- Species Adaptations and Responses to Disturbance

Unit 2: The Living World **(20 days)**

Chapter 10: Wild Species and Biodiversity

- The Value of Wild Species

- Saving Wild Species
- Decline and Protection of Biodiversity

Chapter 11: Ecosystem Capital – Use and Restoration

- Global Perspective on Biological Systems
- Conservation, Preservation, and Restoration
- Biomes and Ecosystems under Pressure
- Forest Biomes and Forest Management

**Lab → Exploring Biodiversity

**Lab → Endangered/Threatened Species Brochure & Oral Report (2-3 days)

**Lab → Exotic Species “Wanted” Poster

Unit 3: Population

(20 days)

Chapter 5: The Human Population

- Human Population Expansion and Its Cause
- Consequences of Population Growth
- Dynamics of Population Growth

**Lab → The Power of the Pyramids

Chapter 6: Population and Development

- Reassessing the Demographic Transition
- Social Modernization
- Promoting Development

**Lab → Population Growth in *Lemna minor*

Unit 4: Land and Water Use

(20 days)

Chapter 7: Water –Hydrologic Cycle and Human Use

- Water as a resource
- Hydrologic Cycle and Human Impacts
- Managing and Controlling Water as a Resource

**Lab→ Exploring the Hydrologic Cycle Game

Chapter 8: Soil – Foundation for Land Ecosystems

- Soil and Plants
- Mineral Nutrients and Nutrient-holding Capacity
- Soil Degradation
- Conserving the Soil
- Rock Cycle and Plate Tectonics

**Lab → Soil Formation and Properties

**Lab → Testing Soil Productivity

**Lab → Minerals and Rocks

Chapter 9: The Production and Distribution of Food

- Major Patterns of Food Production
- Genetically Modified Foods
- Food Distribution and Trade

Unit 5: Energy and Resource Consumption

(20 days)

Chapter 12: Energy from Fossil Fuels

- Energy Sources and Uses
- Oil and Other Fossil Fuels
- Mining of Fossil Fuels
- Fossil Fuels and Energy Security

****Lab** → Exploring Air Pollution Generated by Fossil Fuel Combustion

****Lab** → That's the way the Cookie Crumbles

****Lab** → Fossil Fuels: How Much do you Consume?

Chapter 13: Energy from Nuclear Power

- Nuclear Energy in Perspective
- How Nuclear Energy Works
- Hazards and Costs of Nuclear Power Facilities

Chapter 14: Renewable Energy

- Solar Energy as a Resource
- Renewable Energy for Transportation
- Additional Renewable Energy Options

****Lab** → Alternative Energy Solution Presentation

Unit 6: Pollution

(30 days)

Chapter 17: Water Pollution and Its Prevention

- Water Pollution
- Eutrophication
- Sewage Management and Public Policy

****Lab** → Water Quality of Natural Waters

Chapter 18: Municipal Solid Waste – Disposal and Recovery

- The Solid Waste Problem
- Solutions to the Solid Waste Problem
- Public Policy and Waste Management

****Lab** → Wastewater Treatment

Chapter 19: Hazardous Chemicals – Pollution and Prevention

- Toxicology and Chemical Hazards
- Cleaning up the Mess
- Managing Current Hazardous Waste

Chapter 20: The Atmosphere – Climate, Climate Change, and Ozone Depletion

- Atmosphere, Weather, and Climate
- Global Climate Change
- Response to Climate Change and Ozone Layer Depletion

****Lab** → The Atmosphere Effect and Global Warming

Chapter 21: Atmospheric Pollution

- Air Pollution Essentials
- Major Air Pollutants and Their Sources
- Impacts of Air Pollutants

****Lab** → Acid Deposition

****Lab** → The Coriolis Effect and Atmospheric Circulation

Unit 7: Global Change

(20 days)

Chapter 22: Economics, Public Policy, and the Environment

- Economics and Public Policy
- Resources and the Wealth of Nations
- Pollution and Public Policy

Chapter 23: Sustainable Communities and Lifestyles

- Urban Sprawl
- Urban Blight
- Moving Toward Sustainable Communities

**Lab → Land Use Planning Project

Methods/Student Expectations

- o Instruction consists of mostly lectures, discussions, demonstrations, and written assignments—including research projects, in-class assignments, and homework. All lab and field work will also require a written report.
- o Students should have successfully completed both Lab Biology and Lab Chemistry by obtaining a B or higher as a final overall grade. Students should have also successfully completed Algebra 2 by obtaining an overall grade of B or higher.
- o Students should display a true desire to learn about the environment. Students should have a solid academic record, good critical-thinking ability, and excellent reading skills. Students should have the capability to articulate their thoughts well orally and in writing.

Attendance/Homework

- o In order to be successful in this course, regular attendance is absolutely necessary. If class time is missed, it is the student's responsibility to be sure that all his/her work is completed and handed in on time. You have as many days as you were absent to turn in the missed work for full credit. Late assignments will *not* be accepted for credit.

Student Evaluation/Assessment

Grading Scale

A	92% – 100%
B	83% – 91%
C	74% – 82%
D	65% – 73%
E	Below 64%

- o Student grades are based on daily participation, class and homework assignments, lab reports, quizzes (announced and unannounced), and exams.
- o Tests will usually be announced one week in advance. Each test will mainly consist of a multiple-choice section, free-response, and essay section. Sample AP Exam questions will be incorporated on each of the course tests. Tests will be graded on a raw point scale.

Mid-Term and Final Exams

- o A cumulative mid-term and final exam will also be given during the final week of each semester. The **mid-term** will consist of approximately 50 multiple-choice questions, 1 data-set question, and 1 synthesis and evaluation question (mirroring the AP Exam). The **final exam** will include 100

multiple-choice questions and 4 free-response questions. As per the district's policy, each exam will count for no more than 10% of the student's overall semester grade.

Summer Assignment

- o Students will be required to complete a **Summer Assignment** which will be due on the first day of the school year. The students will be required to find one magazine, journal, or newspaper article dealing with an environmental topic each week. The students will be required to obtain a copy of the article. At least four of the articles must be taken directly from a newspaper, magazine, or scholarly journal NOT obtained from an online source. Along with the article, the student will write a 50-100 word summary/reflection of the article. The articles and summaries will be kept in a three-ring binder and handed in upon return from summer vacation.

Semester Projects

- o Students complete **one research project for each semester.**
 - First Semester – Environmental Science Research Paper
 - Students will complete a 5-7 page research paper dealing with a current environmental issue of their choice.
 - Second Semester – Environmental Science Book Report
 - Chosen from list of approved books dealing with environmental science
 - Book brought to class to answer questions to avoid summaries printed on Internet.
- o Upon completion of the AP Exam in May, each student will work on a culminating project where they will draw upon information learned throughout the course of the year to complete the task.

Academic Dishonesty/Plagiarism

Academic dishonesty and/or plagiarism will in no way be tolerated at any time during this course. As per the student handbook:

“Plagiarism means presenting work done in whole or in part by someone else as if it were one's own. Academic dishonesty includes, but is not limited to reproducing information from the internet, written text without proper citation, illegal use of copyrighted materials, falsification of data any form of text messaging and any form of cheating on exams, tests, quizzes, laboratories, essays, or homework. Students who allow others to copy their work are subject to the same penalties...Students who are found to have engaged in academic dishonesty or plagiarism will receive a zero for the assignment with no make-up privileges.”

Guidelines/Behavior:

- All students are required and expected to be in their assigned seat **before** the bell rings.
- Students are expected to put forth 100% effort until the end of class when **your teacher** dismisses you.
- Classroom disturbances, disrespectfulness to teachers or peers, or any behavior that disrupts the orderly classroom procedures will not be tolerated.
 - Treat others with respect.
 - Substitute teachers shall be treated with the same respect as the regular classroom teacher. Any discipline problems will result in a referral to the office.
 - The dress code shall be in effect at all times. Violations of any kind will be referred to the principal.
 - Food and drinks will not be permitted in the classroom.
 - Sleeping will not be tolerated.
 - Lavatory privileges will be granted before or at the end of each class. Please do not interrupt class to use the lavatory unless there is an emergency.
 - Academic Dishonesty is a serious offense. Work hard and respect yourself. Any student caught cheating will **earn** a zero grade and the parents/legal guardians will be notified.
 - **No book bags, gym, bags, or purses of any kind should remain on students' desks.** All items of this nature must be either placed underneath the students' desks or on the counter at the back or side of the classroom.
 - **Electronic devices** should never be **visible or heard** before, during, or after class. They must be kept out of sight, according to the discipline code in your handbook. Electronic devices will be confiscated. The school is not responsible for lost or stolen electronic devices nor are they responsible for any unauthorized calls made. Please refer to pages 12 – 13 of the student handbook for additional information.

Classroll.com:

Every parent/guardian can check on their child's progress throughout the year on Classroll (www.Classroll.com). Assignments for the week will be available by the first school day of the week at 7:30 am. Student grades will be updated as soon as possible depending on the length of the assignment. Please monitor classroll.com often so that you will be aware of your grade at any time. If you have lost your user ID or password to classroll.com please contact the high school office for a replacement at your earliest convenience.

School Fusion:

Assignments and additional course information will also be available through Miss. Adams' website. Please check the website regularly.

Navigating your way to the website:

- Go to www.bsd.k12.ps.us
- Click on the "Our Schools" link in the left-hand toolbar.
- Click on the "Blackhawk High School" link in the left-hand toolbar.
- Click on the "Our Classrooms" link in the top toolbar.
- Scroll down until you find the teacher's name and click the link.