

FOLSOM CORDOVA UNIFIED SCHOOL DISTRICT

ECOLOGY

Date: February, 2008

Subject Area: Elective

Proposed Grade Level(s): 11-12

Course Length: 1 Year

Grading: A-F

Number of Credits: 5/semester

Prerequisites: Physical/Earth Science and Biology/Life Science

COURSE DESCRIPTION:

Ecology is designed to be a two-semester, non-laboratory elective course in environmental science. Environmental science integrates a wide variety of science disciplines, including geology, biology, environmental studies, environmental science, chemistry, and geography. It also incorporates a sociological and political perspective. It is intended to enable students who have an interest in environmental science, to pursue additional study of topics introduced in Physical/Earth Science and Biology or Life Science in greater depth. Ecology is designed to provide students with case studies, reflecting a balanced presentation of actual environmental situations, inquiry-based investigations to sharpen student's process skills; and activities and lessons that focus on building student's critical-thinking.

GENERAL GOALS/PURPOSE:

- A. Science is a process.
 - 1. Science is a method of learning more about the world.
 - 2. Science constantly changes the way we understand the world.
- B. Energy conversions underlie all ecological processes.
 - 1. Energy cannot be created; it must come from somewhere.
 - 2. As energy flows through systems; at each step more of it becomes unusable.
- C. The Earth itself is one interconnected system.
 - 1. Natural systems change over time and space.
 - 2. Biogeochemical systems vary in ability to recover from disturbances.
- D. Humans alter natural systems.
 - 1. Humans have had an impact on the environment for millions of years.
 - 2. Technology and population growth have enabled humans to increase both the rate and scale of their impact on the environment.
- E. Environmental problems have a cultural and social context.
 - 1. Understanding the role of cultural, social, and economic factors is vital to the development of solutions.
- F. Human survival depends on developing practices that will achieve sustainable systems.

STUDENT READING COMPONENT:

The text for this course is **Environmental Science**, published by Holt, Rinehart and Winston (2000, or newer edition). Reading and interpreting textual/online material and following/interpreting directions are daily components of this class.

Students will:

- 1. Read expository text from the course text and assigned supplemental reading.
- 2. Practice critical reading strategies through the reading of current research articles in environmental science.
- 3. Use reading strategies to extract meaning from text independently.

STUDENT WRITING COMPONENT:

Students will:

1. Write article/case study summaries that include a conclusion written in an expository style.
2. Answer free response questions by writing essay style responses on unit exams.
3. Report findings of environmental case studies using a standard format.

STUDENT ORAL COMPONENT:

Students will:

1. Informally discuss the concepts presented in the text and supplemental materials.
2. Present projects/report and summaries as may be required in a formal manner.
3. Present a culminating ecology research report as appropriate.

DETAILED UNITS OF INSTRUCTION:

This is a brief outline of topics to be addressed in this course.

Unit I

Environmental Science: A Global Perspective/Living Things in Ecosystems:

- A. Understanding Our Environment
- B. Using Science to Solve Environmental Problems
- C. Making Environmental Decisions

Living Things in Ecosystems:

- A. Ecosystems: Everything Is Connected
- B. How Species Interact With Each Other
- C. Adapting to the Environment

Unit II

How Ecosystems Work:

- A. Energy Flow in Ecosystems
- B. The Cycling of Materials
- C. How Ecosystems Change

Unit III

Kinds of Ecosystems:

- A. Forests
- B. Grasslands, Chaparral, Deserts, and Tundra
- C. Freshwater Ecosystems
- D. Marine Ecosystems

Unit IV

Water:

- A. Our Water Resources
- B. Freshwater Pollution
- C. Ocean Pollution

Air:

- A. What Causes Air Pollution?
- B. Effects on Human Health
- C. Acid Precipitation

Unit V

Atmosphere and Climate:

- A. The Atmosphere
- B. Climate

C. Greenhouse Earth

D. The Ozone Shield

Research Report Outline

Unit VI

Land:

A. The City

B. How We Use Land

C. Public Land in the United States

Food:

A. Feeding the People of the World

B. Agriculture and Soil

C. Pest Control

Unit VII

Biodiversity:

A. Biodiversity at Risk

B. Public Policy

C. The Future of Biodiversity

Unit VIII

Energy:

A. Fossil Fuels to Electricity

B. Nuclear Energy

C. A Sustainable Energy Future

Unit IX

Waste:

A. Solid Waste: The Throwaway Society

B. Solid Waste: Options for the Future

C. Hazardous Waste

Unit X

Population Growth:

A. How Populations Change in Size

B. A Growing Human Population

C. Problems Related to Population Growth

Toward a Sensible Future:

A. International Cooperation

B. Environmental Policies in the United States

Ecology Research Report

THIS COURSE WILL PREPARE STUDENTS FOR THE HSEE AND/OR FCUSD EXIT EXAMS IN:

Writing, Reading, Math and Science

LAB FEE, IF REQUIRED: There are no lab fees.

SUBJECT AREA CONTENT STANDARDS TO BE ADDRESSED:

The numbers and letters reference specific Science Content Standards that are aligned to the content.

Unit I

Environmental Science: A Global Perspective/Living Things in Ecosystems:

- A. Understanding Our Environment**
- B. Using Science to Solve Environmental Problems**
- C. Making Environmental Decisions**

Living Things in Ecosystems:

- A. Ecosystems: Everything Is Connected** (Biology 6a-g, 7a, d, 8a,b)
- B. How Species Interact With Each Other** (Biology 6e)
- C. Adapting to the Environment** (Biology 6g)

Unit II

How Ecosystems Work:

- A. Energy Flow in Ecosystems** (Earth 4, 5,6, Biology 6f)
- B. The Cycling of Materials** (Biology 6d, Earth 7a-d)
- C. How Ecosystems Change**

Unit III

Kinds of Ecosystems:

- A. Forests**
- B. Grasslands, Chaparral, Deserts, and Tundra**
- C. Freshwater Ecosystems**
- D. Marine Ecosystems**

Unit IV

Water:

- A. Our Water Resources** (Earth 9c, Biology 6d)
- B. Freshwater Pollution**
- C. Ocean Pollution**

Air:

- A. What Causes Air Pollution?**
- B. Effects on Human Health**
- C. Acid Precipitation**

Unit V

Atmosphere and Climate:

- A. The Atmosphere** (Earth 6a, c, 8a-c)
- B. Climate**(Earth 5, 6b)
- C. Greenhouse Earth**(Earth 6a, c, d, 8a-c)
- D. The Ozone Shield** (Earth 6a, c, 8a-c)

Research Report Outline (Inv.& Experimentation 1m)

Unit VI

Land: (Inv.& Experimentation 1h, History-Social Science 11.11-5, 7)

- A. The City**
- B. How We Use Land**
- C. Public Land in the United States**

Food: (History-Social Science 11.11-5, 7)

- A. Feeding the People of the World**
- B. Agriculture and Soil**
- C. Pest Control**

Unit VII

Biodiversity:

- A. **Biodiversity at Risk** (Biology 6a,b)
- B. **Public Policy**
- C. **The Future of Biodiversity**

Unit VIII

Energy:

- A. **Fossil Fuels to Electricity**
- B. **Nuclear Energy**
- C. **A Sustainable Energy Future**

Unit IX

Waste:

- A. **Solid Waste: The Throwaway Society**
- B. **Solid Waste: Options for the Future**
- C. **Hazardous Waste**

Unit X

Population Growth: (History-Social Science 10.10-1, 10.10-2)

- A. **How Populations Change in Size** (Biology 6c)
- B. **A Growing Human Population** (Biology 6c)
- C. **Problems Related to Population Growth** (Earth 9a)

Toward a Sensible Future:

- A. **International Cooperation**
- B. **Environmental Policies in the United States** (Inv.& Experimentation 1 l&n, History-Social Science 11.11-5)

Ecology Research Report (Inv.& Experimentation 1m)

DISTRICT ESLR'S TO BE ADDRESSED:

Self-Directed Learner: Students will be required to work independently, monitor their progress and meet assignment requirements at stated intervals. This class will prepare students to be self-directed lifelong learners.

Effective Communicator: Students will communicate their understanding of science concepts through written and oral expression.

Quality Producer/Performer: Students will demonstrate successful performance through unit assessments and a final research report on an appropriate topic.

Constructive Thinkers: Reading and analysis of text provided case studies and opposing points of view will develop students' problem solving/critical thinking skills.

Collaborative Workers: Students will need to identify and gather resources and information from outside the school and home to complete assignments.

Responsible Citizens: Students will become more knowledgeable of issues concerning the environment on a regional and global scale.

Science Content Standards for California Public Schools, Kindergarten Through Grade Twelve

<http://www.cde.ca.gov/board/pdf/science.pdf>

History-Social Science Content Standards for California Public Schools, Kindergarten Through Grade Twelve

<http://www.cde.ca.gov/be/st/ss/hstmain.asp>