Environmental Science
Syllabus
JEFFERSON HIGH SCHOOL

Course Description

Environmental Science is a curriculum that is designed to introduce students to major ecological concepts and the environmental problems that affect the world in which we live.

There is an urgent need for environmental education. This program provides one way in which students can become aware of the interactions of people and their environment. The curriculum focuses on concepts that are real-life issues. It promotes awareness and understanding of practical every day problems that affect their lives. It also relates important environmental issues to the lives of the students and their families.

Texts and Materials


Course Schedule

Unit 1 25 Days

Environmental Interrelationships
Environmental Ethics
Making Environmental Decisions
Ecology--The Basics
Food Chains and Food Webs
Adapting to the Environment
Living Things in Ecosystems
How Ecosystems Work
Kinds of Ecosystems

Unit 2 15 Days

The Atmosphere
Air
Atmosphere and Climate
Greenhouse Earth
Ozone Shield
Air Pollutants and their Effects
Radiation as a Pollutant

Unit 3--Water--The Essential Fluid
Part 1 10 Days
Water as an Ecosystem

Part 2 10 Days
Water for the People
Unit 4--Land

Food for the Table
Agriculture and Soil
Feeding the People of the World
Pest Control

15 Days

Unit 5--Energy--Past, Present, and Future

Fossil Fuels to Electricity
Nuclear Energy
A Sustainable Energy Future

15 Days

Target Goals

Unit 1

Understand why environmental problems are complex and interrelated
Realize that environmental problems involve social, political, and economic issues—not just scientific issues
Understand that all organisms have an impact on their surroundings
Describe the three categories into which most environmental problems fall
Explain how the population crisis and the consumption crisis contribute to environmental problems
Differentiate between ethics and morals
Define personal ethics
List three conflicting attitudes toward nature
Distinguish between renewable and nonrenewable resources
Use a decision making model to make a decision about an environmental issue
Name values that are important in making decisions about the environment
Distinguish between the biotic and abiotic factors in an ecosystem
Distinguish between habitat and niche
Explain the five major types of species interactions and give examples of each
List some of the components of an ecosystem
Define the roles of producers, herbivore, carnivore, omnivore, scavenger, parasite, and decomposer
Describe energy flow in a ecosystem
Relate the concept of food web and food chain to trophic levels
Explain the cycling of nutrients
Explain the process of evolution by natural selection
Explain the concept of adaptation
Explain the concept of coevolution
Define the term extinction
Describe secondary and primary succession
Explain the importance of primary species
Define Biome
Associate typical plants and animals with the various biomes

Unit 2

Identify the four parts of the atmosphere that interact to make weather
Identify the gases in the atmosphere that cause the greenhouse effect and describe how the greenhouse effect may change Earth's surface
Identify "greenhouse gases" and explain how they cause the "greenhouse effect"
List human attributes that may be responsible for global warming and cooling Earth's atmosphere
Explain the relationship between technology and global warming
Name the major causes of air pollution
Distinguish between primary and secondary pollutants
Explain how we could reduce air pollution
Describe some possible health effects of air pollution
Describe the job of the Environmental Protection Agency
List the benefit of the Clean Air Act
Give examples of human-made sources of radiation, and explain how human-made sources differ from natural sources of radiation

Unit 3

Part 1

Compare the ability of human-made channels to support wildlife with that of natural rivers and streams
Identify the types of organisms that are found in the following habitats: surface film, open water, bottom, water’s edge
Identify four different habitats found in bodies of water and give examples of organisms that live in each habitat
Draw a food web that includes ten or more aquatic organisms
Give examples of point and nonpoint sources of nutrients
Describe the steps that must be taken in order to control plant growth with herbicide to avoid fish fills

Part 2

Identify three types of factors which affect water quality
Explain why fresh water is a precious resource
Describe our main sources of fresh water
Explain why fresh water is often in short supply
Classify the kinds of water pollutants
Describe the impact of water pollution on people and the environment

Unit 4

Explain why providing adequate food for all of the world’s people is so difficult
Describe the advantages and disadvantages of the green revolution
List the physical, chemical, and biological factors responsible for soil formation
Describe the processes of soil erosion by water and wind
Describe the desertification and how it can be prevented
Explain why pest control is often necessary
Describe alternatives to pesticides

Unit 5

State the two energy laws and give examples that demonstrate each law
Compare the energy efficiencies of two inventions
Classify energy sources as renewable or nonrenewable
List reasons why it is important that we seek alternatives to fossil fuels
Describe the role of the turbine and the generator in the production of electricity
Rank the five major sources of energy used to produce electricity and classify the energy sources as renewable or nonrenewable
Give advantages and disadvantages of each of the methods used to produce electricity
Identify possible environmental problems associated with each energy source
Give several reasons why nuclear power has not become as important a source of electricity as anticipated
Describe methods of conserving energy
Describe several alternative energy sources

**Grading Policy**

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<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Exams</td>
<td>25%</td>
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<tr>
<td>*Notebooks: (notes required)</td>
<td>20%</td>
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<tr>
<td>Work Ethics, Classroom participation, group participation</td>
<td>10%</td>
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<tr>
<td>Spelling (Vocabulary)</td>
<td>20%</td>
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<tr>
<td>Quizzes</td>
<td>25%</td>
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*Notebooks are a very important part of your grade. Materials needed: a three-ring large binder and five dividers. Your notebook should be organized in this manner.

1. Vocabulary
2. Notes
3. Daily Work
4. Labs, group activities, and journal writings
5. Tests

**Instructor**

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