**Curriculum**

**Advanced Placement Environmental Science**

**Course Overview**

The Advanced Placement Environmental Science course is designed for highly-motivated students who are interested in biology, earth sciences, ethics and environmental policy. The course develops the concept of the ecosystem, examining human impact on ecosystems, the interaction of organisms with the environment, and the cyclic activities occurring on the planet. Laboratory work, fieldwork, and the discussion of current world environment events form an integral part of the course.

**Department Standards**

**STANDARD 1: THE NATURE OF SCIENCE**

**STANDARD 2: SCIENCE AND TECHNOLOGY**

**STANDARD 3: THE PHYSICAL SETTING**

**STANDARD 4: THE LIVING ENVIRONMENT**

**STANDARD 5: SCIENCE AND SOCIETY**

**Benchmarks**:

[Science Department Standards & Benchmarks](http://acidale.on-rev.com/dante/Science/Standards&BenchmarksK-12.docx)

**Performance Indicators**

**Quarter One:**

Create an experiment to apply the experimental method. 1.3-1.6, 1.18, 1.28, 1.30, 1.32, 1.36-1.38

Apply the Tragedy of the Commons in an activity to understand common resource use 3.9, 4.27, 4.27, 5.5, 5.9

Organize organisms into a food web and classify their trophic levels 4.31, 2.27

Organize a presentation on species interactions 4.31, 4.2

Apply knowledge of succession to floristic activity 4.28

Differentiate and organize the characteristics of an invasive species with a project 4.28, 4.1

**Quarter Two:**

Organize life history data and produce survivorship curves 5.4, 4.64

Evaluate topics on birth control in a debate format 4.64, 2.34

Implement a lab on LD50 and organize data into toxicity curves 2.34, 4.64, 2.6

Summarize a human disease and organize the data into a presentation 4.66, 4.63

Implement an experiment to test the chemical content of soil 1.30, 1.4-1.6

Implement an experiment to determine the biodiversity of an area 1.4-1.6, 4.2, 4.3

**Quarter Three:**

Plan the use of natural resources with the National Park Project 5.7, 5.5

Critique National Park Projects 1.38, 1.7, 1.8

Implement an activity on resource extraction 1.30, 1.32, 2.7, 2.19

Implement an experiment to test for ground level ozone1.4-1.6, 1.28, 1.30, 2.7, 3.8

Organize a personal water-use inventory 3.9, 1.30, 1.34

Produce the biological oxygen demand for a number of test samples of water 1.30, 1.34

**Quarter Four:**

Implement a project on urban planning and analyze the impact of different types of planning 5.10, 5.2, 5,.4, 5.5

Evaluate nuclear energy versus coal in a debate format 3.8, 3.9, 2.22-2.25

Produce a presentation on sustainable energy 2.22-2.25, 3.9

Summarize the life cycle of a common product and generate a presentation detailing the life cycle 2.14, 2.15

**Assessments**

**Quarter One:**

Summative unit tests

Formative warm-up questions

Ecological Footprint

Food Webs

Succession Game

Happy Fishing Activity

**Quarter Two:**

Risk Lab

Cemetery Lab

Soil Lab

Disease Project

Semester Exam

**Quarter Three:**

Biodiversity/Parking Lot Lab

Park Preserve Project

Cookie Mining Lab

Ozone Lab

BOD Yeast Lab

Water Use Inventory

**Quarter Four:**

Energy Use inventory

Energy Debate

Life of Common Products

Urban Sprawl Project

AP Mock Test

Green TASIS Final Project

**Core Topics**

**Quarter One:**

Overview and History of Environmental Studies; Environmental Ethics; Foundations in Matter, Energy and Life; Communities and Species Interactions; Biomes

**Quarter Two:**

Population Biology; Human Populations; Toxicology; Food and Agriculture; Pest Control

**Quarter Three:**

Biodiversity; Land Use: Forests and Grasslands; Preserving and Restoring Nature; Geology and Earth Resources; Solid, Toxic, and Hazardous Waste; Air, weather, climate; Air pollution; Water use and management; Water pollution

**Quarter Four:**

Conventional Energy; Sustainable Energy; Urbanization and Sustainable Cities; Ecological Economics; Environmental Policy, Law, and Planning; Environmental Legislation

**Specific Content**

**Quarter One:**

History and influential figures in environmental science

Types of environmental movements and perspectives

Worldwide distribution of resources

Sustainable development, current progress, and the future of the environment

Tragedy of the Commons and communal resource use

Environmental justice

Flow of Energy, food webs, and trophic levels

Biogeochemical cycles

Terrestrial and Marine Biomes

Species interactions and community properties

Succession

**Quarter Two:**

Populations: factors that affect change, transitions, growth curves,

environmental impacts

Human risk assessments, toxicology, and disease

Human nutrition and food sources

Soil: composition and degradation

Sustainable agricultural practices

Impacts of pesticides

Biodiversity: types, benefits, threats

**Quarter Three:**

Forest Types and management

Grasslands

National parks and preserves

Restoration Ecology

Wetlands

Tectonic processes: volcanoes, earthquakes, tsunami

Mining: necessity impacts, and reclaiming of land

Recycling impacts and benefits

Climate influences and the greenhouse effect

El Nino

Causes and effects of global climate change

Types of air pollution and their effects

Legislation to control climate change and air pollution

Water: sources, pollution, conservation, legislation

**Quarter Four:**

Fossil fuels: types, use, impact

Nuclear energy: uses, production methods, concerns

Renewable energy: types, advantages, costs

Solid waste: types, management, reduction techniques

Hazardous waste creation and management

Urban planning and sustainable communities

**Resources**

**Quarter One:**

Environmental Science (9th Ed.) Ch. 1-6

Keynote presentations and podcasts posted to Studywiz

Laboratory Handouts and preparation guides

myfootprint.wwf.org.uk

The Lorax Video

AP Free Response Questions

Happy Fishing Lab

Cane Toad Video

Floristic Relay Activity

Invasive Species Wanted Poster

**Quarter Two:**

Brainpop Website

Cemetery Lab

World Populations Issues Video

Risk Survey

'Public Health in Transition' www.sciam.com

'Cold Warefare' article by Michael Osterholm

Points of Pollution PCB Video

Cartoon Guide to the Environment by Gonick and Outwater

Biodiversity Lab

**Quarter Three:**

Park Preserve Project

Cookie Mining Lab

Rio Tinto Mine Video

Blue Planet Video

Mt. St. Helens Video

Blood on the Stone Documentary

'Most Terrifying Video' webcast

Ozone Lab

Sound of Thunder by Ray Bradbury

An Inconvenient Truth Video

BOD Lab

**Quarter Four:**

Laboratory Handouts and preparation guides

Energy Use Inventory

Cookie Mining Lab

Sprawling Project