**Curriculum**

**Environmental Science**

**Course Overview**

The Environmental Science course develops the concept of the ecosystem, examining the interaction of organisms with the environment and the cyclic activities occurring on our planet. A major theme is the impact of human society on global resources and systems. Laboratory or field work, and the discussion of current world environmental 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%26BenchmarksK-12.docx)

**Performance Indicators**

**Quarter One:**

Analyze the need for the study of environmental science. 5.1, 5.2, 5.3, 5.7-5.12 Evaluate personal environmental impact. 3.9, 5.1, 5.2, 5.8

Execute a lab on Tragedy of Commons and generate data from lab and organize it into tables. 3.9, 4.27, 4.27, 5.5, 5.9

Implement a presentation of the environment and society 5.1, 5.2, 5.3, 5.7-5.12

Create an Eco-column project 3.4, 3.7, 3.12

Produce a lab to apply understanding of the experimental method 1.3-1.6, 1.18, 1.28, 1.30, 1.32, 1.36-1.38

Differentiate the kingdoms of life 4.5. 4.6

Explain food webs and produce a food web project4.31, 4.2

Recall and differentiate between the biogeochemical cycles 3.4, 3.7, 3.12

Recognize and analyze types of succession 4:28

**Quarter Two:**

Produce a biome project 4:28, 4:31, 4:43, 4:44, 4.2, 4.3

Evaluate positions in a rainforest debate 4:31, 4:28

Execute a lab on population growth 5.4, 4.64

Differentiate age-structure diagrams 5.4, 4.64

Evaluate invasive species and threats and biodiversity 4.1, 4.2, 4.3, 4.28

**Quarter Three:**

Critique eco-columns 3.4, 3.7, 3.12

Organize a water-use inventory 3.9, 5.1, 5.2, 5.8

Evaluate water-use topics in a debate 3.9, 5.1, 5.2, 5.8

Execute an experiment on acid rain and produce a formal lab write-up 2.19. 2.24

Implement a project on urban planning and analyze the impact of different types of planning 5.4, 5.5, 5.10

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

Evaluate pesticide use in a debate 2.6, 2.7, 2.8, 2.12

Execute the testing of soil for chemical and physical characteristics 1.30, 1.4-1.6

**Quarter Four:**

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

Evaluate impact of lifestyle on energy consumption 2.22-2.25, 3.9, 5.1, 5.2, 5.8, Critique nuclear power versus coal in a debate format 3.8, 3.9, 2.22-2.25

Create a project illustrating renewable energy 2.22-2.25, 3.9

Differentiate impacts of incinerators and recycling in a debate format 2.22-2.25, 3.9, 5.1, 5.2, 5.8

Summarize the life cycle of a common product 2.14, 2.15, 5.8

**Assessments**

**Quarter One:**

Summative Chapter Tests

Formative warm-up questions

Laboratory Reports: Happy Fishing

Eco-column project

**Quarter Two:**

Summative Chapter Tests

Semester Exam

Formative warm-up questions

Biome Project

Rainforest Debate

Population Lab

**Quarter Three:**

Summative Chapter Tests

Formative warm-up questions

3 Gorges Debate

Water Use Inventory

Acid Rain Lab

Sprawling Project

National Park Project

Pest Control Debate

Soil Lab

**Quarter Four:**

Summative Chapter Tests

Formative warm-up questions

Final Exam

Cookie Mining Lab

Nuclear Power Debate

Alternative Energy Poster

Waste Debate

Rootword Exam

**Core Topics**

**Quarter One:**

Science and the Environment; Tools of Environmental Science; The Dynamic Earth; The Organization of Life; How Ecosystems Work

**Quarter Two:**

Biomes; Aquatic Ecosystems; Understanding Populations; The Human Populations; Biodiversity

**Quarter Three:**

Water; Air; Atmosphere and Climate Change; Land; Food and Agriculture

**Quarter Four:**

Mining and Mining Resources; Nonrenewable Energy; Renewable Energy; Waste

**Specific Content**

**Quarter One:**

Definition of Environmental Science

Fields of study in environmental science

Agricultural and Industrial Revolution

Renewable and nonrenewable resources

Tragedy of the Commons and common resource use

Causes and consequences of earthquakes, tsunamis, and volcanoes

Ecological Footprints

Laws of Supply and Demand Consumption and sustainability

Experimental Method

Composition and effects of the atmosphere on Earth

Impact of oceans on atmosphere and climate

Ecosystems and populations

Kingdoms of Life

Evolution by natural and artificial selection

Energy flow through food webs and trophic levels

Biogeochemical Cycles

Types of succession

**Quarter Two:**

Aquatic and terrestrial biomes

Properties and characteristics of populations

Factors that determine population growth

Types of species interactions and relationships

**Quarter Three:**

Critique eco-columns 3.4, 3.7, 3.12

Organize a water-use inventory 3.9, 5.1, 5.2, 5.8

Evaluate water-use topics in a debate 3.9, 5.1, 5.2, 5.8

Execute an experiment on acid rain and produce a formal lab write-up 2.19. 2.24, 4.25

Implement a project on urban planning and analyze the impact of different types of planning 5.4, 5.5, 5.10

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

Evaluate pesticide use in a debate 2.6, 2.7, 2.8, 2.12

Execute the testing of soil for chemical and physical characteristics 1.30, 1.4-1.6

**Quarter Four:**

Types of ores and methods of extraction

Impact and reclamation of mines

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

**Resources**

**Quarter One:**

Holt Environmental Science 2008 ch.1-5

Powerpoints and podcasts posted to StudyWiz

Laboratory Handouts and preparation guides

Happy Fishing Lab

Keynote Presentations

myfootprint.org online quiz

The Lorax video

State of the Planet Video

Mt. St. Helens and volcano videos

Evolutionary Arms Race video

Food Web poster

**Quarter Two:**

Biome Webquest Project

Planet Earth Video

State of the Planet Video

Cane Toads Video

**Quarter Three:**

Water-use Inventory

Soil Lab

A Quandry in Ponder Debate

Supersize Me Video

Omnivores Dilemma book

Fast Food Nation book

**Quarter Four:**

Cookie Mining Lab

Blood on the Stone Documentary

Rio Tinto Mine Documentary

Energy Use Inventory

Liquid Coal Folly Podcast

Nuclear Waste video

Who Killed the Electric Car video

Kinetic and Solar Flashlite manipulatives

Manufactured Landscapes Documentary