

**Unit # - 2 - Ecology**

<b>Standards Addressed</b>	<b>Student Learning Objectives for this Unit</b>	<b>Content Skills and Knowledge</b>	<b>Learning Activities and Instructional Strategies</b>
<p>NSES Standards: Science in Personal and Social Perspectives: Populations, resources, and environments</p> <p>PA STEE Standards:            3.1.7.A (systems)            3.1.7.B (models)            3.1.7.E (change)            3.2.7.C (inquiry)</p> <p>4.6.7.A (e&amp;m fl)            4.6.7.B (cycles)            4.6.7.C (change)            4.7.7.A diversity            4.7.7.B (adapt)            4.7.7.C (loss sp)</p> <p>1.2 read Crit            1.4 writing            1.8 presentation</p>	<p>Students will be able to...</p> <p>Part 1</p> <p>A. Explain the flows of energy and matter from organism to organism.</p> <ul style="list-style-type: none"> <li>▪ Identify and explain the characteristics of biotic and abiotic.</li> <li>▪ Describe and explain the adaptations of plants and animals to their environment.</li> <li>▪ Demonstrate the dependency of living components in the ecosystem on the nonliving components.</li> <li>▪ Explain energy flow through a food web.</li> <li>▪ Explain the importance of the predator/prey relationship and how it maintains the balances within ecosystems.</li> <li>▪ Understand limiting factors and predict their effects on an organism.</li> <li>▪ Identify niches for producers, consumers and decomposers within an ecosystem.</li> <li>▪ Compare and contrast the major ecosystems of Pennsylvania.</li> <li>▪ Identify the major characteristics of a biome.</li> <li>▪ Compare and contrast different biomes and their characteristics.</li> <li>▪ Identify the relationship of abiotic and biotic components and explain their interaction in an ecosystem.</li> <li>▪ Explain how different soil types determine the characteristics of ecosystems.</li> </ul> <p>B. Explain the concepts of cycles.</p> <ul style="list-style-type: none"> <li>▪ Identify and explain cycles within an ecosystem.</li> <li>▪ Analyze the role of different cycles within an ecosystem.</li> </ul>	<p><b>Knowledge – Part 1</b></p> <ul style="list-style-type: none"> <li>▪ Ecology/biotic/abiotic</li> <li>▪ Population, Community, Ecosystem, Biosphere</li> <li>▪ Limiting factors</li> <li>▪ Producers, Consumers, and Decomposers</li> <li>▪ Biome</li> <li>▪ Soil types</li> </ul> <p><b>Skills – Part 1</b></p> <ul style="list-style-type: none"> <li>▪ Visually construct a food web within a given ecosystem.</li> <li>▪ Be able to demonstrate and define succession in ecosystems</li> </ul>	<p><b>Part 1:</b>  <b>Lab or Demonstration:</b>            A Passel o’ Pioneers (Ecosystems Changing) (H)            Change in a Tiny Community (PH)</p> <p><b>Reading:</b>            Living Things in the Environment (PH)            Interactions among Living Things (PH)            Energy Flow in Ecosystems (PH)            Cycles of Matter (PH)            Earth’s Biomes (PH)</p> <p><b>Worksheet:</b>            Analyzing an Ecosystem (PH)            Studying Populations (PH)            Weaving a Food Web: Salt-Marsh Ecosystem (H)            What Goes Around (H)            Know your Biomes (H)            Energy Flow in Ecosystems (PH)            Cycles of Matter 45 (PH)</p> <p><b>Technology:</b>            Biomes and Graphing from NASA  <a href="http://earthobservatory.nasa.gov/Laboratory/Biome/graphindex.html">http://earthobservatory.nasa.gov/Laboratory/Biome/graphindex.html</a></p>

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<p>NSES Standards: Science in Personal and Social Perspectives: Populations, resources, and environments</p>	<p>C. Explain how ecosystems change over time.</p> <ul style="list-style-type: none"> <li>▪ Explain how ecosystems change.</li> <li>▪ Identify the succession stages of a given ecosystem.</li> <li>▪ Explain how specific organisms may change an ecosystem.</li> <li>▪ Explain a change in an ecosystem that relates to humans.</li> </ul> <p>Part 2</p> <p>A. Describe diversity of plants and animals in ecosystems.</p> <ul style="list-style-type: none"> <li>• Recognize that adaptations are developed over long periods of time and are passed on from one generation to the next.</li> <li>• Understand levels of ecosystem organization (e.g., individuals, populations, species).</li> </ul> <p>B. Explain how species of living organisms adapt to their environment.</p> <ul style="list-style-type: none"> <li>• Compare and contrast animals and plants that have very specific survival requirements with those that have more general requirements for survival.</li> <li>• Explain how living things respond to changes in their environment.</li> </ul> <p>C. Explain natural or human actions in relation to the loss of species.</p> <ul style="list-style-type: none"> <li>• Identify natural or human impacts that cause habitat loss.</li> <li>• Explain how habitat loss can affect the interaction among species and the population of a species.</li> <li>• Explain the differences among threatened, endangered and extinct species.</li> <li>• Identify Pennsylvania plants and animals that are on the threatened or endangered list.</li> <li>• Describe state laws passed regarding threatened and endangered species in Pennsylvania.</li> </ul>	<p><b>Knowledge – Part 2</b></p> <ul style="list-style-type: none"> <li>▪ Adaptations over time</li> <li>▪ Habitat loss</li> <li>▪ Threatened, endangered and extinct species</li> </ul> <p><b>Skills – Part 2</b></p> <ul style="list-style-type: none"> <li>▪ Analyze adaptations as they relate to specific ecosystem of an organism.</li> <li>▪ Report on one endangered or a species recently taken off of the endangered list.</li> </ul>	<p><b>Part 2:</b></p> <p><b>Lab or Demonstration:</b> Adaptation: It’s a Way of Life (H) Survival is Just a Roll of the Dice (H) Change in a Tiny Community (PH)</p> <p><b>Reading:</b> Studying Populations (PH) Succession (PH) Endangered Species (PH)</p> <p><b>Worksheet:</b> Succession 57 (PH) From Pond to Forest (PH)</p> <p><b>Technology:</b> Exploring the Environment <a href="http://www.cotf.edu/ete/">http://www.cotf.edu/ete/</a></p>

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### Unit Modifications

#### Part 1:

Living Things in the Environment (PH)  
 Interactions among Living Things (PH)  
 Earth's Biomes (PH)

#### Part 2:

Succession (PH)  
 Endangered Species (PH)

### Unit Enrichments

#### Part 1:

Analyzing Interactions Among Organisms (PH)  
 Counting Turtles (PH)  
 Food Webs at Hydrothermal Vents (PH)  
 Testing for Oxygen and Carbon Dioxide (PH)

#### Part 2:

From Pond to Forest (PH)  
 Endangered Species (PH)

### Suggested Assessment Techniques for Unit

Core 3: Ecology Unit Common Standards Assessment  
 (district common)

### Materials/Technology for Unit

Biomes and Graphing from NASA

<http://earthobservatory.nasa.gov/Laboratory/Biome/graphindex.html>

Exploring the Environment

<http://www.cotf.edu/ete/>