

### **Topic 1: Ecological Knowledge**

**Topic Overview:** Habitat is composed of many integrated components including food, water, shelter and space. In addition to supporting wildlife, ecosystems must furnish the products humans need.

#### **Standards:**

- 4.1.10A** Examine the effects of limiting factors on population dynamics.
- 4.1.10D** Research practices that impact biodiversity in specific ecosystems.
- 4.3.10B** Analyze how humans manage and distribute natural resources.
- 4.5.10A** Explain how public policy encourages or discourages the sustainable use of natural resources.

#### **Essential Question (Core Concepts)**

How do the biotic and abiotic factors of an ecosystem affect the carrying capacity of plants and animals in Pennsylvania? How can we as residents conserve the resources of our land to keep the Pennsylvania ecosystem thrive?

#### **Objectives (Skills/Knowledge)**

- Students will describe interactions or interdependency of organisms within an ecosystem and relate the increase of wildlife populations to the improvement of habitats.
- Students will formulate and test hypotheses related to wildlife populations and carrying capacity and describe the significance of carrying capacity.
- Students will describe biodiversity as it relates to natural systems, species or individuals; explain how natural selection favors individuals with traits adapted to their environment and explain that for a wildlife population to sustain itself, there must be enough habitat to support a healthy-sized gene pool.

#### **Vocabulary**

Abiotic Factor  
Biotic Factor  
Community  
Biodiversity  
Ecosystem  
Population  
Species  
Deciduous Forest  
Coniferous Forest  
Interdependency  
Habitat  
Niche  
Management

#### **Activities/Strategies/Study Skills**

- Envirocard dating game
- PA Land Regions activity
- Gizmos on the following topics:
  - Forest Ecosystem
  - Rainfall Bird Metric
  - Photosynthesis
  - Pond Ecosystem

- Ecosystem Scavenger Hunt
- Project Wild materials on the following
  - Ecosystem Facelift
  - Bottleneck Genes
  - Back from the brink
  - Cabin Conflict
  - Fire ecologies
  - Changing the Land
  - Carrying Capacity
  - Forest in a Jar

### **Assessments**

Unit 1 test

Vocabulary Review

On-going formative assessment

### **Additional Resources**

Project Wild Handbook

### **Topic 2: Land Use**

**Topic Overview:** The conservation and management of our natural resources is vital in order to sustain the Pennsylvania habitat.

### **Standards:**

**4.3.10B** Analyze how humans manage and distribute natural resources.

**4.5.10A** Explain how public policy encourages or discourages the sustainable use of natural resources.

### **Essential Question (Core Concepts)**

What are the agencies in place for preserving our natural resources? What are the roles of these agencies and how can we as citizens contribute to their success?

### **Objectives (Skills/Knowledge)**

- Students will describe possible circumstances in which public and private interests may conflict in land use issues and evaluate points of view that may arise under such circumstances.
- Students will identify environmental problems of concern to both people and wildlife and generalize that people and wildlife are subject to similar environmental problems.

### **Vocabulary**

Erosion

Deposition

Habitat

Niche

Abiotic Factor

Biotic Factor

Community

Biodiversity

Ecosystem

Population

Species

### **Activities/Strategies/Study Skills**

- Improvement plan for local habitat
- Pennsylvania Land Choices Activity
- Gizmos
  - Environmental Barometer
  - Extreme environment survivals
- Biome Activity

### **Assessments**

Unit 2 test

Vocabulary Quiz

On-going formative assessment

### **Additional Resources**

Project Wild Handbook

### **Topic 3: Sustaining Fish and Wildlife Resources**

**Topic Overview:** Wildlife comprises all nonhuman and nondomesticated animals. Wildlife numbers and species compositions are not static but are constantly changing.

### **Standards:**

**4.1.10.C:** Evaluate the efficiency of energy flow within a food web.

**4.2.10.C:** Explain the relationship between water quality and the diversity of life in a freshwater ecosystem.

**4.1.12.A:** Analyze the significance of biological diversity in an ecosystem.

**4.1.12 D:** Analyze the effects of new and emerging technologies on biodiversity in specific ecosystems.

### **Essential Question (Core Concepts)**

How do species adapt to limiting factors of an ecosystem? Analyze the relationship between habitat changes to plant and animal population fluctuations.

### **Objectives (Skills/Knowledge)**

- Students will describe the importance of interdependence to the functioning of an ecosystem.
- Students will analyze the impact of hunting on the population of specific species in Pennsylvania.

### **Vocabulary**

Biomagnification

Natural Selection

Intrusive species

Adaptation

Interdependence

Food Web

Land use

Herbivore

Carnivore

Predator

Wildlife management

Conservation

Endangered

Extinct

### **Activities/Strategies/Study Skills**

- Predator - Prey Simulation
- Forests as Renewable Natural Resources
- Ecological Pyramids
- Estimating Populations
- Analysis of Owl Pellets
- Project Wild activities on the following topics:
  - Deer Dilemma
  - Back from the Brink
  - Birds of Prey
  - Deer Crossing
  - Predator
  - Let's Talk Turkey
  - Philosophical Differences
  - Wildlife Issues
- Gizmos on the following topics:
  - Food Chain
  - Evolution
  - Microevolution
  - Estimating population sizes
  - Rabbit Populations
  - Natural Selection

### **Assessments**

Unit 3 test

Vocabulary Quiz

On-going formative assessment

### **Additional Resources**

Project Wild Handbook

### **Topic 4: Wildlife in Pennsylvania**

**Topic Overview:** Wildlife comprises all nonhuman and nondomesticated animals. Wildlife numbers and species compositions are not static but are constantly changing.

### **Standards:**

**4.1.10.C:** Evaluate the efficiency of energy flow within a food web.

**4.2.10.C:** Explain the relationship between water quality and the diversity of life in a freshwater ecosystem.

**4.1.12.A:** Analyze the significance of biological diversity in an ecosystem.

### **Essential Question (Core Concepts)**

Identify the common types of wildlife in Pennsylvania, classify them as herbivores, carnivores or omnivores and identify their niches in the Pennsylvania habitat.

### **Objectives (Skills/Knowledge)**

- Students will identify various factors involved in a wildlife management issue and evaluate alternatives in a complex issue involving wildlife.
- Students will evaluate hypothetical wildlife management decisions and identify at least four factors that can affect the size of a wildlife population.

## **Vocabulary**

Biomagnification  
Natural Selection  
Intrusive species  
Adaptation  
Interdependence  
Food Web  
Land use  
Herbivore  
Omnivore  
Carnivore  
Predator  
Wildlife management  
Conservation  
Endangered  
Extinct

## **Activities/Strategies/Study Skills**

- Bald Eagle Activity
- Invasive species in Pennsylvania
- Pennsylvania Game animal research project
- Lynx eats the Hare
- Aging of game animals
- Project Wild activities on the following topics:
  - Deer Dilemma
  - Back from the Brink
  - Birds of Prey
  - Deer Crossing
  - Predator
  - Let's Talk Turkey
  - Philosophical Differences
  - Wildlife Issues
- Gizmos on the following topics:
  - Food Chain
  - Evolution
  - Microevolution
  - Estimating population sizes
  - Rabbit Populations
  - Natural Selection

## **Assessments**

Unit 4 test  
Vocabulary Quiz  
On-going formative assessment

## **Additional Resources**

Project Wild Handbook