



# Course Overview

High School | 11-12 | Ecology - Last Updated on April 4, 2025

## DESCRIPTION

### K-12 Content Area | Mission & Philosophy Statement

- Young people are born investigators, with natural curiosities about the physical, biological, and social worlds they experience. Anchoring science learning in real-world phenomena connects curiosities to core conceptual understandings.
- Students actively construct understanding through inquiry, experimentation, and analysis to develop science and engineering practices such as asking questions, planning and carrying out investigations, and constructing explanations.
- Integration of crosscutting concepts such as patterns, cause and effect, and systems thinking promote interdisciplinary understanding and sense-making of the natural world.
- Science learning occurs alongside other disciplines to foster holistic understanding and application of knowledge.

### Course Description

Ecology is the study of the interrelationships and interactions between organisms and their environment and the patterns these interrelationships and interactions create. Ecology takes the entire living world as its domain, requiring knowledge and input from a wide range of scientific disciplines in developing a comprehensive view of how living systems work and interconnect. Ecology, therefore, presents an opportunity to develop insights into the basic principles and mechanisms upon which all life depends for existence, including humans.

This Ecology course will offer an investigation into the structure and function of living systems. The course will utilize a variety of available ecosystems as “learning laboratories,” focusing on providing first-hand experiences with terrestrial and aquatic life to enhance student understanding of basic ecological principles, interconnections and patterns. An emphasis will be placed on fieldwork projects designed to create opportunities for students to observe and monitor the ecological condition of local ecosystems.

## STANDARDS

### Next Generation Science (NGSS) - High School - Earth and Space Sciences

HS-ESS1-1.

HS-ESS1-5.

HS-ESS2-1.

HS-ESS2-2.

HS-ESS2-4.

HS-ESS2-5.

HS-ESS2-6.

HS-ESS2-7.

HS-ESS3-3.

### Pennsylvania - Grade 12 - Environment and Ecology



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- 4.1
- 4.1.12.A
- 4.1.12.B
- 4.1.12.C
- 4.1.12.D
- 4.1.12.E
- 4.1.12.F
- 4.2
- 4.2.12.A
- 4.2.12.B
- 4.2.12.C
- 4.2.12.D

## COURSE OBJECTIVES

Specific objectives for this course are aligned to the Next Generation Science Standards, the Pennsylvania Academic Standards for Science and Technology and Engineering Education.

## ASSESSMENT TYPES

The following assessment types will be used during the course:

- Curriculum Based Measures
- Formative Assessments
- Summative Assessments
- Performance Based Assessments

## SUGGESTED METHODS OF INSTRUCTION

A science program demands the use of a variety of instructional strategies to foster scientific thinking. Below is a list of suggested strategies for high-quality instruction:

- Instructional components outlined in *Framework for Teaching* by Charlotte Danielson
- Hands-on learning
- Posing questions for investigation
- Cooperative learning and collaboration
- Inquiry, engineering, and design

## RESOURCES

District Approved Program Resources	District Approved Supplemental Resources	District Approved Technology Resources
Bowman, Cain, and Hacker. (2014). <i>Ecology</i> . Sinauer. <ul style="list-style-type: none"> <li>• Student Edition Print Version</li> </ul> Bowman, Cain, and Hacker. (2014). <i>Ecology</i> . Sinauer. <ul style="list-style-type: none"> <li>• Teacher Edition Print Version</li> </ul>	<ul style="list-style-type: none"> <li>• Teacher Created Resources</li> <li>• District approved supplemental resources and labs</li> </ul>	