

Understanding by Design Curricula Plan GEN ‘WHAT IS AN ECOSYSTEM?’ ECO-SERVICE MODULE

Title: What is an Ecosystem?

Module Overview: In this GEN Module, learners work as naturalists, as they investigate their school site ecosystem. They discover that the plants and animals on their site (or at any ecosystem) provide a variety of important free services to all creatures on Earth. These free services are referred to by ecologists as life support functions and include air purification, climate control, food production, pollination, soil production, pest and disease control, water purification and a genetic library. During all GEN programs, we refer to the individual life support functions metaphorically as ecosystem ‘Departments’. A fantasy character serves as the manager of each Department. Learners also discover that plant and animal species which help provide these services can be thought of as Department ‘eco- workers’.

A GEN take-home packet allows learners to extend their knowledge to the ecosystem near their home and share their knowledge with family members. An optional stewardship/service learning project involves developing a plan to improve the health of the ecosystem at their site.

Grades: 3rd -6th

Stage 1 – Desired Results

Established Goals:

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Third Grade Living Environment

S3L1. Learners will investigate the habitats of different organisms and the dependence of organisms on their habitat. Identify features of green plants that allow them to live and thrive in different regions of Georgia.

Identify features of animals that allow them to live and thrive in different regions of Georgia.

Explain what will happen to an organism if the habitat is changed.

S3L2. Learners will recognize the effects of pollution and humans on the environment.

Explain the effects of pollution (such as littering) to the habitats of plants and animals.

Identify ways to protect the environment (conservation of resources, recycling of materials).

Fourth Grade Living Environment

S4L1: Learners will describe the roles of organisms and the flow of energy within an ecosystem.

a. Identify the roles of producers, consumers, and decomposers in a community.

b. Demonstrate the flow of energy through a food web/chain beginning with sunlight and including producers, consumers, and decomposers.

c. Predict how changes in the environment would affect a community (ecosystem) of organisms.

d. Predict effects on a population if some of the plants or animals in the community are scarce or if there are too many.

S4L2. Learners will identify factors that affect the survival or extinction of organisms such as adaptation, variation of behaviors (hibernation) and external features (camouflage and protection).

a. Identify the external features of organisms that allow them to survive or reproduce better than organisms that do not have these features (e.g. camouflage, use of hibernation, protection, etc.)

b. Identify factors that may have led to the extinction of some organisms.

Fifth Grade Life Science

S5L1. Learners will classify organisms into groups and relate how they determined the groups with how and why scientists use classification.

b. Demonstrate how plants are sorted into groups.

Living Environment

Sixth Grade

S6E5. Learners will investigate the scientific view of how the Earth’s surface is formed.

g. Describe soil as consisting of weathered rocks and decomposed organic material.

h. Explain the effects of human activity on the erosion of the earth’s surface.

i. Describe methods for conserving natural resources such as water, soil, and air.

Habits of the Mind

3rd grade skills

- Records investigations
- Makes sketches
- Compares and describes numerically
- Researches
- Uses tools
- Answers their own questions
- Communicates findings

4th grade skills

- Asks questions that lead to investigations
- Conducts simple investigations
- Uses tools for collecting data
- Uses data to answer questions
- Writes and uses instructions
- Justifies reasonable answers
- Identifies patterns of change
- Researches for information

5th grade skills

- Records observations
- Offers and considers reasoning
- Quantifies data
- Uses scientific tools
- Describes changes
- Compares physical attributes
- Draws and sketches
- Questions and seeks to find answers
- Researches for scientific information
- Replicates investigations

6th grade skills

- Records investigations clearly and accurately
- Uses scientific tools; Uses technology

<p>S5L2. Learners will recognize that offspring can resemble parents in inherited traits and learned behaviors. b. Discuss what a gene is and the role genes play in the transfer of traits. <u>Earth Science</u> S5E1. Learners will identify surface features of the Earth caused by constructive and destructive processes. a. Identify surface features of the Earth caused by constructive processes. b. Identify and find examples of surface features caused by destructive processes. c. Relate the role of technology and human intervention in the control of constructive and destructive processes. <u>Life Science</u> S5L4. Learners will relate how microorganisms benefit or harm larger organisms. a. Identify beneficial microorganisms and explain why they are beneficial. b. Identify harmful microorganisms and explain why they are harmful.</p>	<ul style="list-style-type: none"> • Interprets graphs, tables, and charts • Writes clearly • Analyzes scientific data via calculations and inference • Recognizes the importance of explaining data with precision and accuracy • Asks quality questions
<p>Understandings: U <i>Learners will understand that</i></p> <ul style="list-style-type: none"> • The environment provides free services that maintain a healthy balance on the planet. • Human activity influences ecosystems throughout the world. 	<p>Essential Questions: Q</p> <ul style="list-style-type: none"> • What work is the Earth doing at my school? • Who and what lives on my school ecosystem and what jobs do they do? • How does the earth help keep me healthy? • Is my school ecosystem healthy? • How can I help my school ecosystem be healthier? • How can I help the Earth do its work?
<p><i>Learners will know...</i> K</p> <ul style="list-style-type: none"> • Every place on earth is an ecosystem including school sites and backyards. • An ecosystem is made up of all the living and non living things at a particular place on Earth. • Ecosystems provide ecoservices that support our life and keep Earth healthy. • Earth's 'work or jobs' include cleaning the air, making food, protecting soil and recycling many things into soil, making baby plants (pollination) and cleaning the water. • People share the Earth with all the other living things – plants, animals, fungi, microorganisms (living things that we cannot see). • My school, the playground and all of the people, plants and animals there are part of my school ecosystem. 	<p><i>Learners will be able to...</i> S</p> <ul style="list-style-type: none"> • name and describe the Garden Earth Departments (eco-services). • identify organisms that help provide eco-services on their school site. • identify organisms who depend upon the eco-services on their school site. • Classify parts of an ecosystem as living and non-living. • describe the purpose of the 3 Checkpoints for collecting data on their club site. • collect preliminary baseline data for the eco-services on their site.
<p>Stage 2 – Assessment Evidence</p>	
<p>Performance Task: T</p> <ol style="list-style-type: none"> 1. AT HOME: Complete 'What is an Ecosystem', eight page pamphlet with insert letter to parents; visit designated websites and complete associated questions. Teach parents and other siblings about their local ecosystem. 2. Record results of school site experiments and Aldo Leopold Journaling activity in a Club journal. 	
<p>Key Criteria Check journals for accuracy, understanding, and concern about their site.</p>	
<p>Other Evidence OE Evidence of interest in Club and its activities can be monitored by number of learners returning completed Ecosystem take home packet for reward.</p>	
<p>Stage 3 – LEARNING PLANS: See GEN Quick Guides</p>	