

Air Cleaning Eco-Service Understanding by Design Curricula Plan

Overview: In this module, learners work as naturalists investigating air quality and green plants on their school site. Activities include air monitoring stations and a sequence of explorations that help learners understand the role of trees in cleaning the air and supporting life on Earth. A GEN take-home pamphlet allows learners to extend and share their knowledge by examining, with their families, the trees and air near their homes. Optional stewardship/service learning projects involve learners in planting trees on their site and educating other people about the importance of green plants in improving air quality.

Grades: 2nd-5th

Stage 1 – Desired Results

Related GPSs:

G

Second Grade

S2E3. Learners will observe and record changes in their surrounding and infer the causes of the changes.

a. Recognize effects that occur in a specific area caused by weather, plants, animals, and/or people.

S2L1. Learners will investigate the life cycles of different living organisms.

b. Relate seasonal changes to observations of how a tree changes throughout a school year.

c. Investigate the life cycle of a plant by growing a plant from a seed and by recording changes over a period of time.

Third Grade

S3L1. Learners will investigate the habitats of different organisms and the dependence of organisms on their habitat.

a. Differentiate between habitats of Georgia (mountains, marsh/swamp, coast, Piedmont, Atlantic Ocean) and the organisms that live there.

b. Identify features of green plants that allow them to live and thrive in different regions of Georgia.

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

d. 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.

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

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

Fourth Grade

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

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).

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

Fifth Grade

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.

S5L3. Learners will diagram and label parts of various cells (plant, animal, single-celled, multi-celled).

a. Use magnifiers such as microscopes or hand lenses to observe cells and their structure.

b. Identify parts of a plant cell (membrane, wall, cytoplasm, nucleus, chloroplasts) and of an animal cell (membrane, cytoplasm, and nucleus) and determine the function of the parts.

S5L4. Learners will relate how microorganisms benefit or harm larger organisms.

Habits of the Mind:

2nd grade skills

- Asks questions and answers by observation
- Assembles and takes apart
- Describes changes in materials
- Communicates ideas
- Questions and attempts answers
- Gives accurate descriptions

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

<p>Understandings:</p> <p><i>Learners will understand that...</i></p> <ul style="list-style-type: none"> • Trees give us food, medicine, shelter, oxygen, shade, and many other useful products (gifts). • Trees and other plants clean the air. • I can help the Earth have cleaner air. 	<p>U Essential Questions: Q</p> <ul style="list-style-type: none"> • How do ecosystems clean the air? • Is air cleaning happening in my school ecosystem? • Does my school make the air dirty? Does my school make the air clean? • What can I do to help the Earth clean the air?
<p><i>Learners will know...</i></p> <ul style="list-style-type: none"> • Trees provide many things for humans and other organisms in any ecosystem. • Plants act as air filters, cleaning the air of harmful chemicals and particulates. • Many different types of trees and plants grow in my local environment. • Many things can make the air dirty. Cars and factories are some of them. • I can help the Earth have cleaner air. • Leaves have stomata that help in the gas exchange that cleans our air. • Trees give us food, medicine, shelter, oxygen, shade, and many other useful products (gifts). • Trees are made up of many parts that help it to work. • I can identify trees by their leaves. • I can help my school ecosystem have cleaner air. 	<p>K <i>Learners will be able to...</i> S</p> <ul style="list-style-type: none"> ○ discover that green plants provide clean air and oxygen. ○ collect data on the number of trees, amount of particulate matter in the air, ozone levels and ultraviolet rays on their school site. ○ measure trees as foresters do. ○ describe the parts of a tree and explain how each part functions or works. ○ describe three threats to the Air Cleaning Department. ○ state two ways they can help their school site's Air Department.
<p>Stage 2 – Assessment Evidence</p>	
<p>Performance Task: T</p> <ol style="list-style-type: none"> 1. AT HOME: Complete “A Visit to the Air Cleaning Department”, six-page pamphlet with insert letter to parents; visit designated websites and complete associated questions. Teach parents and other siblings about the Air Department. 2. Record results of Air Department studies in a club journal and understand the importance of not altering results of their studies in their journal. 3. Examine individual GEN club calendars for recorded observations related to the air department at their homes and in the local environment. 4. Puppet Show, Newspaper articles 	
<p>Key Criteria</p>	
<p>Other Evidence OE</p> <ol style="list-style-type: none"> 1. Develop and perform a puppet show for younger learners that demonstrates the importance the school site air department; puppet show can also be performed at GEN Science Night. 2. Plant trees (air-cleaning agents) on their school site or at another location. 	
<p>Stage 3 – LEARNING PLANS: See Air Department Quick Guides</p>	