

Best Lesson

Grade Level: Third Grade

Title of Lesson: Bottle Ecosystems

Unit Title: Habitats, Ecosystems, and Environments

Performance Standard(s) Covered:

S3L1. Students 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.

Essential Question: What are the different types of habitats found in Georgia? How do organisms interact with one another in their environment?

Objective(s): Students will learn the different living and non-living components as well as the different types of an ecosystem in a closed, self-contained system through a hands on activity.

Key Words and Terms:

Biotic

Abiotic

Ecosystem

Environment

Producer

Consumer

Decomposer

Terrestrial

Aquatic

Learning Activity:

Abstract: During this activity, students will learn the key components that make up a standard ecosystem (biotic and abiotic factors). Students will also learn that ecosystems work in conjunction with one another (terrestrial with aquatic/wetland).

Materials Needed:

5 plastic liter bottles

2 straws or cotton strings

Tape

Potting Soil

Sand (for aquatic chamber)

Decomposable Material (for the worms to eat/decomposing chamber)

2 Fish (not too many in a small environment)

Water (About 1/4-1/2 liter)

Worms

Aquatic Plants (1 or 2)

Terrestrial Plants (1 or 2)

Safety Concerns:

When cutting the bottles initially to construct the closed ecosystem, make sure that the sharp objects used to do this are out of sight and reach of the children.

Procedure:

- 1) Rinse out a large clear-plastic soda bottle and peel the label off. Cut off the top of the bottle right before the neck starts to taper toward the cap. Save the top and the cap to use on the completed ecosystem.
- 2) Record what you put in each chamber and how much (measured or weighed) while assembling your ecosystem. Also, take notes on how you assembled your ecosystem so you can write instructions for others who want to duplicate your work in order to compare results.
- 3) Terrestrial chamber must include soil (e.g., potting soil or soil you brought in) and seeds or plants. You may add other organisms and abiotic factors.
- 4) Decomposition chamber must include leaf/grass material, potting soil, animals (especially known decomposers like worms), a piece of fruit, fungus, or potato.
- 5) Aquatic chamber must include substrate material (e.g., sand/gravel/aquarium rock), at least one fish and one aquatic plant.
- 6) Remember to record exactly what you put in – including appropriate quantities when applicable!
- 7) Add precipitation to the bottle ecosystem once it is assembled. Record the volume of water you put in. Throughout the data collection and observation period, you may add precipitation, but again be sure to record the dates and volume of water added.
- 8) Look for changes in each chamber and collect data at intervals specified in class. Record your data.

Notes and Tips:

- 1) You may want to do all of the explaining about the ecosystem before actually even beginning to construct it. Third grade students become distracted very easily.

References:

Science Textbook

http://www.ehow.com/how_5164713_make-ecosystem-bottle.html