



Ecosystems – Grades K-5

Nebraska Science Standards

2.3.1.a Differentiate between living and nonliving things

2.3.1.b Identify the basic needs of living things (food, water, air, space, shelter)

2.4.2.a Describe Earth materials (sand, soil, rocks, water)

Objective: The goal of this activity is to introduce the ecosystem concept, the components of an ecosystem, and to discuss the importance of ecosystems to life in general and to humans. Students will create a small ecosystem using simple materials found in the home and outdoors.

Materials (provided by CSM):

- Observation packet (typically for Grades 3-5)
- Plastic cups with lids
- Seedlings
- Insects
- Potting soil
- Sand
- Gravel
- Plastic spoons
- Permanent marker

Materials (provided by the classroom):

- Water
- Organic matter (leaves and twigs collected by the students outdoors)

Discussion (Questions to ask the students, if there is a whiteboard, have the students volunteer to come up and draw them)

- What is an ecosystem?
 - An ecosystem is a community of living organisms (plants, animals, and microbes) in conjunction with the nonliving components of their environment (things like air, water, and soil), interacting as a system.
- What do living things need to stay alive?
 - Oxygen, food, and shelter.
- What is the difference between abiotic and biotic?

- Abiotic is nonliving and biotic is living.
- Rocks and soil are abiotic, and the animals and plants in the ecosystem are biotic.
- What is a consumer? What is a producer?
 - Heterotrophs are consumers because they cannot make their own energy. We are heterotrophs; therefore, we need to eat food.
 - A producer is an autotroph, like plants. Plants can produce their own energy and produce oxygen.
- What are omnivores, herbivores, and carnivores?
 - Omnivores are consumers that eat both plants and animals.
 - Examples of omnivores are humans, flamingos, bears, and foxes.
 - Herbivores are only plant-eating consumers.
 - Examples of herbivores are cows, deer, and elephants.
 - Carnivores are only meat-eating consumers.
 - Examples of carnivores are lions, tigers, and sharks.
- What are scavengers and decomposers?
 - Scavengers are animals that eat the remains of dead animals, like vultures and hyenas.
 - Decomposers are organisms that break down dead or decaying organisms, like some bacteria, fungi, and worms.

Activity Description:

Students will each create an ecosystem in a cup that can be observed over time. The teacher may choose to have their students record their observations over a 10-day period, either in the classroom or at home.

Setup:

- Have the students and volunteers take a moment to collect twigs and leaves from the playground or outdoors. If the weather does not permit this, volunteers should plan ahead and collect before going to the school.
- Students will work in groups or pairs (can also have them work on their own and set up an “assembly line” to get the materials, whichever works best for the class).
- Set up the materials at the front of the class. Have the students come up when it is their turn to get materials.

Procedure:

1. Open the cup and add 1-2 inches of gravel.
2. Add 1 inch of sand to the cup on top of the gravel.
3. Add 4 inches of potting soil on top of the sand.
4. Ask the students what type of components are in their ecosystem?
5. Dig three small holes and put one seed in each hole. Cover the seeds with potting soil.
6. Pour a little water into the cup to moisten the soil.

7. Add some organic matter, twigs, and leaves, to the cup.
8. Put the bugs in the cup!
9. Tape the lid back onto the cup.
10. Write the students' names on their ecosystems.
11. For Grades 3-5, work together to answer the questions in the observation packet and discuss how to use the observation packet over the next 10 days.