Ecosystems - Grades K-2

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 in particular. Students will create a small ecosystem using simple materials found in the home.

Materials:

Provided by Students:

- Leafs

Provided by CSM:

- Gravel
- Sand
- Soil
- Seeds
- Bugs
- Box cutter knife
- Plastic cups, breakers, and buckets
- Duct tape
- Permanent marker

Discussion:

- 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 mineral soil), interacting as a system.
- What do living things need to stay alive?
    - Oxygen, food, and shelter
    - Abiotic = nonliving
- What is a consumer? What is a producer?
    - Heterotrophs are consumers because they cannot make their own energy. We are heterotrophs; this is why we need to eat food.

    - A producer is an autotroph, like plants. Plants are able to produce their own energy.
- 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 bottle 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.

Set up:

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...which ever 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. Use the box cutter to make a "lid" for the bottle. Cut where the neck starts to narrow and do not cut the lid off. There should still be a piece left attached.
2. Add 1-2 inches of gravel
3. Add 1 inch of sand
4. Add 4 inches of potting soil
5. Ask the students what type of components are in their ecosystem?
6. Nonliving components (abiotic)
7. Dig three small holes and put one seed in each hole. Cover the seeds.
8. Pour a little bit of water into the bottle
9. Add some leaves
10. Put the bugs in!
11. Tape the lid back onto the bottle. The cap should be left off.
12. Write the names of the group on the bottle

Continue to ask the students what is in their ecosystem. Why did we add three layers in the beginning? What are the consumers and the producers? Decomposers?

If there are leftover bugs, please release them outside or provide to Dr. Grove. Please ensure cricket carrier is clean and returned to the tote.