

Case of the Missing Pumpkin

Objective

Students will design and conduct an experiment to observe a pumpkin decomposing and record observations.

Background

Decomposition is nature's way of taking life and energy from dead plants and animals and changing it so new plants can use it. Bacteria and fungus eat the dead tissue from plants and excrete it in a form that helps live plants grow. These decomposers are so small you can't see them except when they are all massed together. That's the green, white or blue and furry stuff you've probably seen growing on food you keep in the refrigerator too long. Earthworms, land snails, slugs and even fly larva (maggots) are also important decomposers.

In nature dead plants and animals decompose and become humus for the soil. Humus acts as a sponge to help the soil hold water. It also traps air in the soil. Plants need air and water in the soil to grow. When the farmer plants crops in the soil, the growing crops take out nutrients. The farmer can replace those nutrients by tilling dead plants back into the soil and letting the decomposers go to work.

Science

1. Read and discuss background and vocabulary about decomposition.
2. Bring one or two pumpkins to class. October and November would be ideal months.
 - Clean out one of the pumpkins and carve a face. Place a candle inside, and use the pumpkin as a centerpiece. The burning candle will help speed up decomposition.
 - If desired, bring an additional pumpkin and leave it alone so you can compare the decomposition rates.
 - Sprinkle garden soil in the bottom of the aquarium. Mix leaves, sticks and grass clippings with the soil. Push the pumpkin into the soil so it is partially buried.
 - Moisten the contents of the aquarium with a spray bottle, and cover it with plastic cling wrap. Tape it so little or no air will get in.
 - Students will predict what changes will occur in the pumpkin.
 - Place a calendar near the aquarium. Mark the day the experiment began.
 - Students will observe the aquarium and mark the calendar whenever anything significant occurs (the first day it “rains,” the day the pumpkin's face caves in, etc.).
 - Insert a thermometer into the pumpkin, and record the temperature

Oklahoma Academic Standards

GRADE 3
Life Science: 1-1

GRADE 5
Life Science: 2-1

Materials

1-2 pumpkins
1-2 aquariums
potting soil or garden soil
leaves, sticks, grass clippings
plastic cling wrap
tape

Vocabulary

bacteria—a group of single-celled microorganisms that live in soil, water, the bodies of plants and animals, or matter obtained from living things and are important because of their chemical effects and disease-causing abilities

decompose—to break down through chemical change; rot

decomposer—an organism (as a bacterium or a fungus) that feeds on and breaks down dead plant or animal matter

decomposition—the breakdown of plant or animal matter

fungus—any of a kingdom of living things (as molds, rusts, mildews, smuts, and mushrooms) that lack chlorophyll, are parasitic or live on dead or decaying organic matter, and were formerly considered plants

humus—a brown or black product of partial decay of plant or animal matter that forms the organic portion of soil

daily.

—If you have two pumpkins decomposing, students will record the differences in the decomposition processes of the two.

—Students will count how many days it takes the pumpkin to completely decompose.

—Students will work in small groups to interpret the results of their observations and report to the class.

Create a classroom compost pile, and us

3. Create a classroom compost pile, and use the new soil to plant seedlings in the spring.
4. Try decomposing different types of refuse to see which item decompose most quickly. Note: Do not use meat, dairy products or any fatty materials in the classroom compost.
—Students will make their own hypotheses and write them in complete paragraphs.
5. Discuss how composting and recycling help keep landfills from filling up to quickly.

Extra Reading

Bial, Raymond, *A Handful of Dirt*, Walker and Co., 2000.

Brendler, Carol, and Ard Hoyt, *Winnie Finn, Worm Farmer*, Farrar, Straus and Giroux, 2009.

Gardner, Robert, *Super Science Projects About Earth's Soil and Water (Rockin' Earth Science Experiments)*, Enslow, 2007.

Lindbo, David, *SOIL! Get the Inside Scoop*, American Society of Agronomy, 2008.

Nardi, James B., *The World Beneath Our Feet: A Guide to Life in the Soil*, Oxford, 2003.

Rosinsky, Natalie M., *Dirt: The Scoop on Soil*, Picture Window, 2003.

Stille, Darlene R., and Hossain and Farhana, *Soil: Digging Into Earth's Vital Resource (Exploring Science: Earth Science Series)*, Compass Point, 2005.

Name _____

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On the pumpkin below, write adjectives describing the disappearing pumpkin experiment.

