

Compost Lab

Standards of Learning

Science: 3.1, 3.7, 4.1, 4.4

Objective

Students will:

- Explore how organic material decomposes and becomes part of the soil.
- Create 2 sets of composting bottles.

Materials

- How Groundhog's Garden Grew, by Lynne Cherry
- 4 clear 2-liter bottles, with labels removed, per group of 4-6 students
 - a. Cut off the tops of the 2 bottles so they are 10 centimeters (4 inches) tall.
 - b. Cut off the tops of the other 2 bottles so they are 23 centimeters (9 inches) tall.
- Scissors & rulers
- Magnifying glasses
- Paper plates & plastic spoons
- 2-3 liters of natural topsoil
- Vegetable scraps, grass clippings, leaves, shredded newspapers
- Spray bottle filled with water per group
- Thermometer
- Handout, attached

Background Knowledge

In the book, the author writes, "... When they finished, Squirrel added composted leaves to her garden as fertilizer for the coming year." What does this mean? It means that natural soil is something that comes from rotting plants and other materials. The rotting plant materials make the soil rich in nutrients. This is a natural cycle called *decomposition*. If there was no decomposition, there would be no plants. There are microscopic organisms in the soil such as bacteria. Temperature plays a role in decomposition. The warmer the temperature, the better the rotting plant material decomposes.

Procedure

1. Teacher reads How Groundhog's Garden Grew to students. Be sure to point out where Squirrel adds composted leaves to her garden for the coming year.
2. Discuss the purpose of composting with students. List examples of things that may be used for composting (examples: leaves, food scraps, grass clippings, coffee grounds). Explain that it is a form of recycling.
3. Tell students that they will be creating their own compost.
4. Each group will create 2 sets of composting bottles.
5. Students should collect topsoil near school. If possible, include in soil sample, leaf litter and grass clippings.
6. Give each group of students a paper plate, a plastic spoon, and magnifying glasses. Place a large scoop of soil on each plate and ask students to list what they see in the soil.
7. Create a class list of what students observed in the soil. Look at the list to see if the items can be categorized (*living* – organic and *nonliving* – inorganic things).



8. Ask students: How will the organic part of the soil change over time? *It will decompose.*
9. Each student should complete the handout that is attached.

Extension

Include other variables in the lab. Examples: place one bottle near and heat source and the other in a cool place; place an earthworm in one of the bottles.

Have students graph the rates of decomposition of the two bottles.



Compost Lab for How Groundhog's Garden Grew by Lynne Cherry

Your teacher will give you the necessary materials to complete this lab. Please follow the directions carefully. You will have to record your observations over the next 7 days.

1. Start with the 2 short soda bottles (4 inches) that have their tops already cut off. Fill each of them with a mixture of grass clippings, leaves, vegetable scraps, and shredded newspapers. Fill until it is 1 inch from the top. Spray one bottle with water until it's very damp. Leave the other bottle dry.
2. Take a tall soda bottle (9 inches) and turn it upside down over the damp bottle. Slip the tapered end of the taller bottle inside the shorter one and push them together, making sure the seal is snug. Repeat the same thing to the dry bottle. Make sure both soda bottle cylinders fit tightly. If the compost bottle with the holes (see below) begins to dry out, take it apart and spray more water on it.
3. On the WET composting bottle, use a thumbtack to gently punch 15 small holes into the top cylinder of the bottle. Do NOT punch any holes in the other compost bottle. Use tape to seal the connection between the 2 bottles.
4. What are the environmental differences between your two compost bottles? Is that going to impact what will happen in the compost bottles? Explain.

5. Predict what you will see in each bottle over time.

6. Over the next 7 days, you will record your observations on the chart. At the end of 7 days, which compost bottle promoted faster decomposition? Explain.



Date & Time	Wet Compost Bottle	Dry Compost Bottle	Air Temperature
1			
2			
3			
4			
5			
6			
7			

