

# Composting in a Jar

(Adapted from: Rethinking Recycling: An Oregon Waste Reduction Curriculum, Oregon Department of Environmental Quality)

## *Teacher Worksheet*

### **Background**

Composting organic waste is a natural process of aerobic decomposition that allows nutrients in organic material to return to the soil and enrich it for plant growth in the future. Bacteria, fungus, and worms all help in the composting process. In the presence of air and moisture these organisms decompose plants, releasing energy in the form of heat.

Composting is an excellent way of “recycling” organic waste at home and at school in order to keep this valuable carbon-rich material from entering the landfill where it can no longer be used by nature. In fact, organic material entering a landfill will gradually break down, but under the anaerobic conditions of a landfill, methane gas will form as a by-product. Methane is known to contribute to global warming and is an environmental management issue at landfills because it causes fires and explosions if improperly controlled. Thus, keeping organic wastes out of landfills not only benefits the environment, it makes the landfills easier and safer to manage.

### **Materials**

- A large clear wide mouth plastic or glass jar for each group of students
- An ample supply of fertile soil (not potting soil, which is sterile)
- The students will be asked to supply the organic waste (kitchen or garden compost) for their jars, but it will help to make prior arrangement with the kitchen staff or maintenance people in case there is a problem
- A 12" ruler for each group
- A thermometer for each group
- 2 sheets of graph paper for each student (or one sheet of reversible)
- A hand lens for each group

### **Procedure**

Prior to starting this activity, assign students to groups and determine if they will compost garden waste, kitchen waste, or a combination of the two.

Kitchen compost can be a mixture of some or all of the following: vegetable peels and seeds, fruit peels and seeds, coffee grounds, eggshells, nut shells, any other vegetable or fruit scraps. (Avoid using meat scraps, bones, dairy products, oil, or fat. They may attract pests.)

Garden compost can be a mixture of some or all of the following: hay or straw, grass clippings, leaves, ashes, sawdust, wood chips, or weeds.

On the starting day of the activity, students will set up their jars. Begin with a layer about 2" of soil. Moisten it, but do not soak it. Add materials to be composted in repeating layers with dirt.

Add small amounts of water to make materials moist, but not soaked. Finish with a 1" layer of dirt. (You may make a few points with the custodian if you arrange to do this activity outside.)

Take the temperature of the materials in the jar and measure the height in inches. Record as the first column readings on the student worksheet.

Set the jars on a windowsill and monitor the heights and temperatures every other day over a two-week period. Record measurements in the chart and moisten the mixture a little after measurements are taken. Try to keep things damp, but not mushy.

At the end of the first week have the students stir up their mixture with a long-handled spoon and remove a little from the jar to examine with a hand lens. Have them record what they see. Repeat at the end of the second week. (This activity can go longer, but 2 weeks should be long enough to see results.) Students are asked on their sheets to graph the heights and the temperatures over the time of the activity. They are also asked to draw a few conclusions and speculate what is happening.

Plan at the end of the activity for disposal of the composts. Perhaps the school has a pile already or you can start one. At least arrange for a parent to take the compost home if they wish to do so.

## **Vocabulary**

*Compost:* (verb) to help the decay or decomposition of organic matter (like grass, leaves, food).

*Organic material:* Living or once living substances such as food, leaves, grass, etc.; scientifically refers to matter that contains carbon, hydrogen and oxygen.

*Aerobic:* The state of having oxygen, for example, for healthy composting, aerobic conditions are necessary.

*Bacteria:* The tiny microorganisms or "bugs" that is useful in composting because they break down organic matter. However, bacteria can also be unhealthy, such as the kind that grows on garbage and litter.

*Organisms:* Living individuals, plants and animals.

*Biodegradable:* capable of being broken down into simple substances or basic elements by microorganisms.

*Decompose:* to decay or rot; come apart; change form; break down into simpler components.