

World of Worms

OBJECTIVE: To explain how a worm composter works.

MATERIALS: calcium carbonate, foil tray, opaque plastic container with a lid (55 cm x 40 cm x 30 cm), organic peat loam, paper clip, red wigglers, sealed container, shredded paper/cardboard, something to puncture holes in container with, sheer nylon material, HANDOUT: **Worm Power** (E39)

VOCABULARY: bedding, calcium carbonate, castings, composter, opaque, organic peat loam, quarter, red wigglers, vermicomposting, waste

BACKGROUND:

Conventional home composting usually requires a backyard or other outdoor area. Offices and schools that would like to compost must overcome the issue of space. Worm composting, also called vermicomposting, allows apartment dwellers, office workers and classrooms to compost. Red wigglers are the worms used in this form of waste management. These worms can eat their weight in organic waste each day, so 1 kg of worms could handle 1 kg of waste. Waste and the bedding inside a worm composter is eaten by the red wigglers. The worms excrete castings which are an excellent natural plant food. Details of how to build a worm composter are given in the PROCEDURE section of this activity.

PROCEDURE:

1. Explain the information contained in the BACKGROUND section of the activity to the students. Be sure to express how conventional methods of composting cannot always be practiced and how worms are a viable way of handling waste.
2. Tell the class they are going to construct their own worm composters. Divide the class into groups of approximately 5 students. Each group should now use the following steps in building their composter:
 - Obtain an opaque plastic container, with a lid, approximately 55 cm long by 40 cm wide by 30 cm in depth. Drill or cut 6 holes in the base of the container and cover the bottom of the container with nylon mesh. Along the top of each side of the container drill or cut several air holes. See HANDOUT: **Worm Power** (E39)
 - Place the container in a foil tray. Be sure to raise the container so it sits just above the tray. This will allow excess moisture to drip out of the worm composter.
 - Worms need bedding in which to live. For this container 7 kg of bedding will be needed. The bedding should be 80% shredded paper and cardboard and 20% organic peat loam. Calcium carbonate could be added to this mixture to avoid fruit fly problems.
 - Now add 4 litres of water to the bedding mixture. For the worms to survive, they need bedding with a 75% moisture content.

World of Worms (cont.)

PROCEDURE (cont.)

- One half kilogram of red wigglers should now be added to the bedding. Bait and tackle shops can supply the worms or they may be found near manure piles. Use a small amount of bedding to cover the worms.
- The container is now ready to accept waste. The surface of the bedding should be divided into quarters. Waste is buried in Quarter 1. Make sure the waste is completely covered. A paper clip or similar item should be placed above the waste to mark where food was last buried.
- One week later, more waste is added this time in Quarter 2. The paper clip is moved to mark this as the latest burial.
- Students continue to bury their waste in the four quarters weekly. A pattern should be followed (i.e. 1, 2, 3, 4). By adhering to a set pattern the worms get into a rhythm and the waste has enough time to be completely eaten.

NOTE: Lunch waste and other "worm food" should be stored in an ice cream tub or other sealed container until it is time to feed the worms. After six to twelve weeks the worms will have turned all of the bedding into castings. Push the castings to one side of the container and add fresh bedding to the other side. Bury food in the new bedding, wait a day or two so the worms can migrate to the new bedding. Remove the old castings. Fill the empty side of the container with more bedding then continue to add waste as per steps 9-11. If the worms multiply to a point where there seems too many for the container use them to start another worm composter or release the worms into the ground.

EXTENSION:

1. Use the castings as plant food for a classroom or school interior garden.
2. Build a worm composter large enough for the entire school to use. Have the students maintain the composter.
3. Instead of selling cheese or chocolate bars sell worm composters to finance a class trip.

EVALUATION:

1. Have each group calculate how many kilograms (kg) of worms it would take to turn the classroom's total daily waste into castings. Assume each child produced 0.5 kg of waste per day and remember 1 kg of waste can be eaten by 1 kg of worms.
2. Have the children design a stand for their worm composters and the tub used to hold their waste.
3. Ask the students to write a list of reasons why people should use worms to compost and a list of reasons why people probably would choose not to use worms.