



Watching Worms

Lesson Description

Students learn how worms eat, where they live, and how they help the environment. Students observe worms in soil and create art about worms.

Subjects

Art, Language Arts,
Science

Teacher Background

Earthworms benefit other animals, plants, and the soil because they are *nutrient* recyclers, or *decomposers*. Earthworms eat soil and digest the *organic matter* from the soil to get nutrients. The organic material came from plants and animals that lived in the soil. Earthworms spread their nutrient-rich excrement, or *castings*, on the soil surface and throughout the topsoil, creating new soil in which new plants can grow. The castings also provide food for smaller animals and microorganisms, which break down the organic material even further.

Earthworms live in deep, narrow tunnels, called *burrows*, in the soil. Earthworm burrows loosen the soil, allowing plant roots to grow down through the soil, and providing tunnels to the lower soil layers for smaller organisms. These burrows also *aerate* the soil, bringing oxygen down into the soil and permitting rainwater to flow through soil and carry nutrients to plant roots.

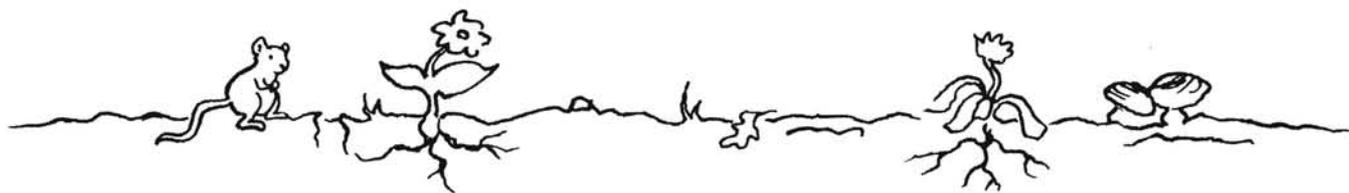
Time

Prep: 30 minutes

Activities: 2 ½–3 hours
(not including Extensions)



Topic: earthworms
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Student Objectives

Students will be able to:

- describe a worm's diet and habitat; and
- explain why worms are important for a healthy environment.

Materials

For the Class

- Tall, narrow glass or plastic jar with lid—e.g., tennis ball container
- Spoon
- Grass
- Dead leaves
- Soil (see page x)
- Water
- Bucket
- Two pieces of black construction paper
- Two rubberbands
- White crayon

For Each Student Group

- Newspaper
- Five Red Wiggler earthworms
- Tall, narrow glass or plastic jar with lid—e.g., tennis ball container
- Spoon
- Grass
- Dead leaves
- Soil (see page x)
- Two pieces of black construction paper

There are more than 7,000 species of earthworms. Earthworms live in temperate soils and in many tropical soils, and the different species can be found seasonally at all depths in the soil. Students may think these animals are “yucky,” but they are necessary for healthy soil and a healthy environment.

Learning Cycle

Perception: 30 minutes

- 1 Review the soil layers discussed in Lesson 3. (If you did not conduct Lesson 3, information on soil layers is on page 17.)
- 2 Discuss worms that live in the upper layer.
- 3 Discuss a worm's diet and how it helps soil. Worms eat organic matter and recycle nutrients back to soil, to other animals, and to plants.
- 4 Discuss worms' habitat and that habitat's benefit to the soil. Worm burrows keep the soil loose, letting water and nutrients in and allowing plant roots to spread through the soil.

Exploration: 30 minutes–1 hour

Prep Obtain worms from a bait or vermicomposting (composting with worms) store. Before conducting the activity, keep the worms in damp soil and feed them composting scraps.

Cover student work areas with newspaper. Each work area should have a jar, a cup of damp (but not wet) soil, a spoon, composting scraps, rubber bands, one piece of black construction paper, and a white crayon. Poke a few small holes in the jar lids.



- 1 Students should fill the jar three-quarters full with loosely-packed soil. Students can then put bits of composting scraps into the jar on top of the soil.
- 2 Place five worms in each jar for the students. Have students cover the jars.
- 3 Demonstrate how to wrap the jar in black paper, leaving the top of the jar uncovered so that light comes in at the top and forces worms down into the soil. Students should secure the paper with two rubber bands, and use white crayons or colored pencils to write their names on the paper (see Figure 9.1).
- 4 Ask students to predict what will happen in their jars over time. You may wish to record student predictions.
- 5 For comparison with the students' jars, label two jars "Jar 1" and "Jar 2." Use dry soil in Jar 1 and damp soil in Jar 2. Add compost scraps but do not add any worms to these jars. Ask students to predict the difference over time between the three types of jars based on what you discussed in the Perception section.
- 6 Clean up work areas.
- 7 Your class can maintain these jars for several days, adding bits of composting scraps each day. If the soil is dry, add a little water to the jars. Students can remove the black paper from their jars to see how the worms have burrowed through the soil. Replace the paper after observation.
- 8 After several days, discuss the difference between student jars with worms and demonstration Jars 1 and 2 without worms. The soil in the worm-filled student jars should be dark and rich. The soil in

Materials Cont'd.

- Two rubber bands
- White crayon
- Eyedropper
- Water
- One piece of white construction paper
- Scissors
- Glue
- Writing paper
- Pencil
- Student Handout 9A

Figure 9.1.
The worm jar.





Jar 1 (unwatered, without worms) should look sandy and have dried-up compost; the soil in Jar 2 (watered, without worms), should look sandy and the compost moldy and not broken-down.

- 9 Distribute Student Handout 9A. Students should draw what happened in each jar. Students can label the drawings and note which compost scraps the worms ate. Provide younger students with a list of vocabulary words to choose from.
- 10 After your class has finished observing the jars, empty the jars into the bucket, than dispose of the waste material outside. Release the worms in a safe, protected place outside.

Application: 30 minutes

Prep Cover student work areas with newspaper. Each work area should have a piece of white construction paper, a piece of black paper, scissors, glue, and crayons, colored pencils, or markers.

- 1 Demonstrate how to cut out a large worm shape from a piece of white construction paper and glue it on to black paper to create a worm book (see Figure 9.2).

Figure 9.2. The worm book.



- 2 Students can write and illustrate short stories on the white space on their worm books. The story should describe life from a worm's point of view, describing what a worm eats, where it lives, and how it helps the soil.



Evaluation: 1 hour

Students can work alone or with a partner to design a poster that shows worms below the soil surface. Students should draw and label the three soil layers, along with plants and animals in the soil, including an earthworm. You might also ask your students to write on the poster useful things the worm does for the soil.

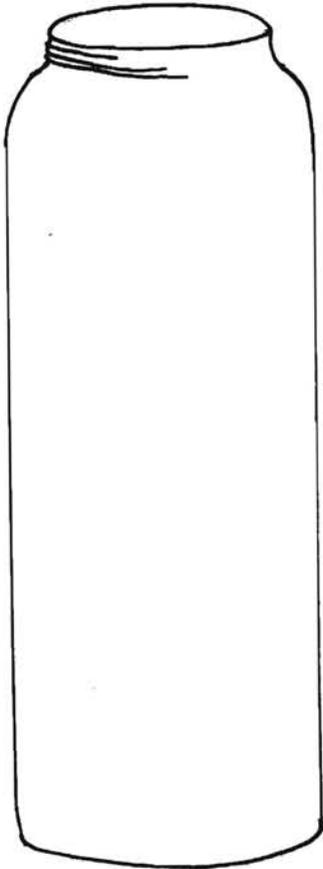
Devise a rubric that spells out your expectations for the poster and share it before you begin the project so that students know what is expected. Figure i.4 on page xvii shows an example of a rubric.

Extensions: 15–45 minutes

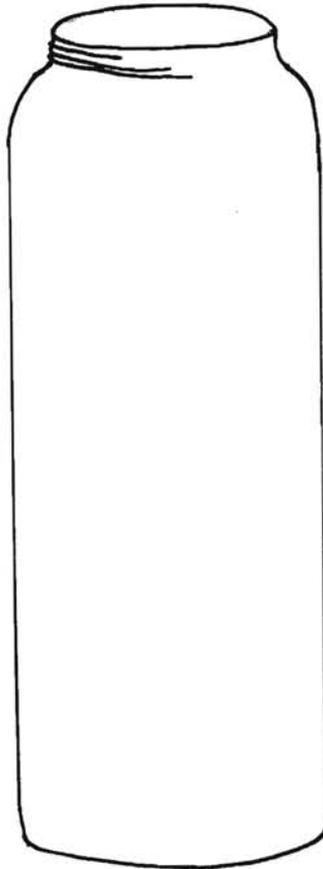
- Take the class outside to observe birds hunting worms. Watch a robin pause over the ground, detect a worm's movement, then strike the ground with its bill. Since an earthworm can't see or hear, it must feel the bird's vibrations on the ground to escape.
- After a rainstorm, look for worms on the wet ground outside. Help students understand that worms come to the soil surface during or after a rainstorm because water has filled their burrows and displaced the air.
- Take a field trip to a composting facility to see nutrient-recycling worms in action.
- If you teach older students, introduce the scientific method by having student groups design their own worm experiments. Students can write and then test a question, such as:
 - What surfaces do worms like (e.g., light, dark, rough, smooth, shiny, etc.)?
 - Do worms prefer light or dark environments?
 - Do worms prefer dry or moist environments?

Name: _____

My Jar



Jar 1



Jar 2

