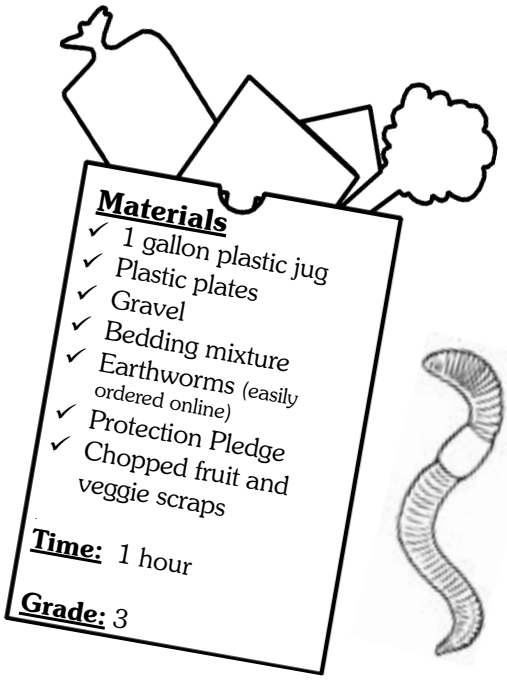
Classroom Activities

A Worm's World



Objectives

1. Identify living and nonliving things in a small environment composed of living and nonliving things.
2. Predict the effects of changes in the environment on a living organism.
3. Observe and record the effect of changes upon the living organisms and nonliving things in a small-scale environment.

Background

Many sources have determined that earth worms have been working in the soil for as long as 120 million years. And they have been doing it all over the world. Earthworms live wherever they find enough food and moisture in the soil and wherever temperatures are not too extreme. The only places where worms don't live at all are deserts (too dry) and areas where the ground is frozen all or much of the time (too cold). Earthworms are constantly burrowing and tunneling into the earth. As they go, they gobble up dirt and debris. They grind this mixture into mush and break down the debris. Then they leave behind a new soild (called castings) that's packed with minerals and nutrients that plants need. Many small types of earthworms live right at the surface of the soil. These worms feed mainly on crumbling leaves and other plant debris. Larger types, 3 to 6 inches long, live deeper in the soil, usually within the first foot or so. They tunnel along, constantly making new burrows and filling in their old tunnels with castings as they go. Night crawlers and some related types of earthworms live deeper in the ground. These worms, which can be 12 inches long, make permanent burrows. Their homes are narrow tunnels that go straight down into the earth as deep as 6 feet.

Because of where these creatures live, their physical features are quite different from other animals. A worm's body is divided into rings, or segement (perhaps as many as several hundred) which are called annuli. Underneath a worm's skin are two layers of muscles--one running lengthwise and one running around the worm. When the muscles that run around the worm contract, its body stretches out long and thin. When the lengthwise muscles contract, the worm draws its body up short. By contracting first one set and then the other, the worm inches through the soil. A coat of slimy mucus, produced by the worm's skin, helps it glide along. Earthworms are missing some features of other animals. For one, they don't have eyes. Eyes aren't really necessary underground. But worms do have "eyespots," special cells on their bodies that can detect light. That's important because sunlight can kill a worm. Worms are very sensitive to the ultraviolet radiation in sunlight—the same radiation that gives us a sunburn. They will move away from white or bluish light, although they don't seem to mind dim or red light. Earthworms are also sensitive to temperature and touch. They also don't have ears. They "hear" by sensing vibrations in the soil.

Activity Procedures

1. Order worms. There are serveral sites on the internet. Be sure to compare prices. One reputable comany is Kazarie Worm Farm, (352) 463-7823, www.kazarie.com (100 worms for 14.95).
2. Have students fill out their Worm Protection Pledge (see page 6). This certificate will definetely cut down on creature cruelty and other discipline problems.
3. Request that each student bring in a 1 gallon plastic milk jug.
4. Cut the top from a clean, clear plastic gallon jug. (You will want to do this for the students.)
5. Poke holes for drainage in the bottom of the jug. Make sure you have a plastic plate under the jug to collect excess water.
6. Add 1 inch of gravel for drainage. If you provide shredded newspapers and carefully watch the moisture content in the worm jug, you can omit the gravel.
7. Poke holes in a plastic lid or plate and place over the gravel.
8. Add 1 inch of bedding mixture (peat moss, grass clippings, vacuum cleaner bag, debris, leaves, dryer lint, shredded newspaper, etc.) on top of the plate.
9. Add a few earthworms.
10. Sprinkle some food scraps on top of the worms.
11. Cover with more bedding material. Sprinkle with water. DON'T SOAK!

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12. Cover the jug with dark paper to screen out light and encourage the worms to burrow next to the edges.
13. Put the jug in a cool place. Sprinkle with water and add food as needed.
14. Observe daily. Record what you see in a daily log.

Additional Activities, What's Next?

When you have finished watching your worms in their environment, try the following experiments to learn more about these small, but important animals. Before you begin these activities, have students make a prediction based on what they have already observed about worms.

1. How do earthworms react to light?
   a. Cover the bottom of a plastic container with paper towels. Use a water mister to dampen the towels evenly. Be careful not to get it soaking wet.
   b. Put several earthworms in the center of the container. Remember to mist them with water from time to time as you continue.
   c. Cover half of the container with a dark colored posterboard sheet.
   d. Shine a flashlight on the open area of the container and note what the worms do. Then return the worms to their storage container.
   e. Cover the flashlight lens with colored celophane, secured with a rubber band. Repeat the experiment using a new group of worms. Try again with different colors of cellophane, using new worms each time and noting how they react.
   f. Ask the students: Did the worms try to move out of the light? Did they act the same way in light of various colors? Was your prediction correct? Can you explain why the worms acted as they did?
2. What do worms like to eat?
   a. Fill a large plastic container to within a few inches of the top with evenly moist (not soggy) garden soil.
   b. Place about a dozen worms on the soil, cover the container, and place in a cool place. Wait a day.
   c. Cut or break various food items (green leaves, small twigs, flower petals, orange or apple peels, grass clippings, breakfast cereal, etc.)
   d. After a day, open the container. The worms will have burrowed under the soil. Place the food items on the soil surface. Use two to three pieces of each kind of food, and put them in different places on the soil.
   e. Cover the container and put it back in a cool place. After a day or so, check the box to see which foods have disappeared.
   f. Ask the students: Which foods did the worms eat? Repeat this activity several times to see if you get the same results. Put the bits of food in different places each time. What do your results tell you about worm food likes and dislikes?

Worm Protection Pledge

Number of worms being protected: _____

As the protector of these worms, I promise to:

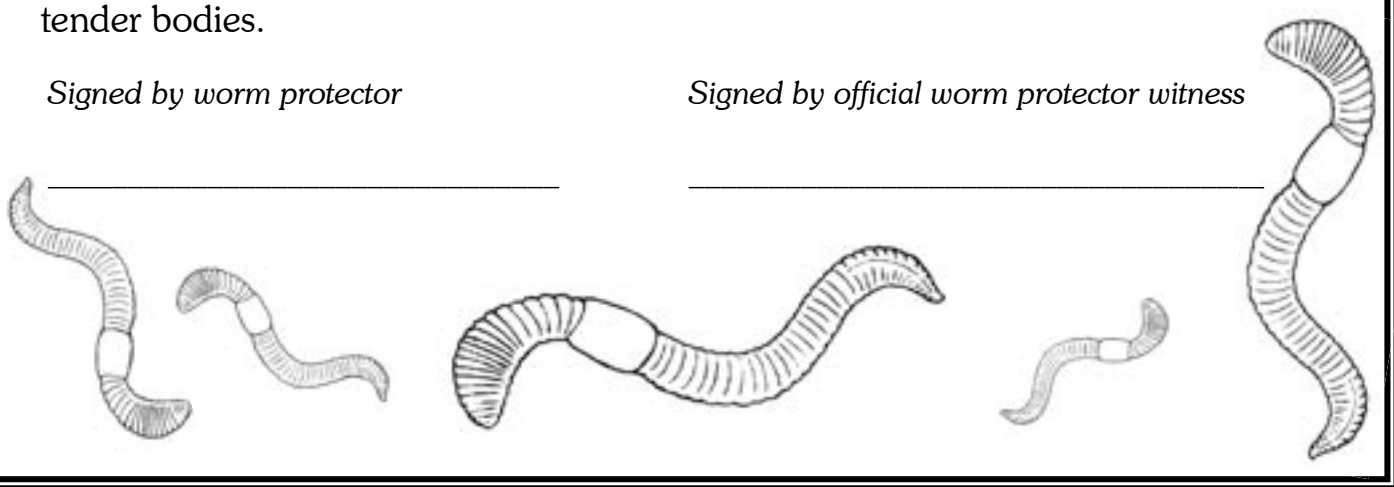
1. Give these worms a comfortable, cool, moist home, complete with a fresh air supply and curtains to keep out any harmful light rays.
2. Feed my worms a varied diet of healthy foods.
3. Treat my worms with care and respect, not handling roughly, or harming their tender bodies.

Signed by worm protector

_____

Signed by official worm protector witness

_____



Kids Corner

Waste and Worms

Read the following paragraphs and finish the statements below to form a complete paragraph.

Many communities treat waste or garbage as something to throw away and get rid of. We need to change the way we think about waste. We need to think, "Waste is a resource. Resources have value." And we need to ask ourselves, "How can we move from a wasteful community to a waste-free community?" Canberra, Australia's capital city, is the world's first community to establish the goal, "No waste by 2010." For its citizens and governmental leaders, a waste-free community is one in which no material is regarded as useless. They don't just throw their garabe away; they use their garbage for other things.

Citizens in nearly 9,000 cities in the United States can follow Australia's example by participating in recycling just by taking their recyclables to the curb. Recycling has become so common that over 100 million people in the United States do it each year. More people recycle than vote!

Earthworms in nature play an important role in recycling organic nutrients from dead materials, such as leaves and grass, back into living organisms. Rarely does anyone see them perform their tasks. Some people create their own homes for worms, called worm bins. If you decide to create a worm bin in your home or school, these small animals will eat your garbage and significantly help to achieve the goal of a waste-free community. You will see them working noiselessly, with almost no odor, turning mounds of garbage into compost you can use directly on your house plants and in your garden. You will enjoy healthier looking plants, better tasting vegetables, and money in the bank. You will spend less on fertilizers and trash disposal.

Recycling with worms is a good beginning toward lowering waste, a task that needs to start somewhere. You, personally, can make it happen.

Although I already knew that _____

_____,

by reading this article, I learned _____

_____.

Another fact I learned was _____

_____.

Finally, I learned that _____

_____.

However, one question I still have is _____

_____?

Some new words I learned by reading this article were _____, _____, and _____.

Overall, I think studying about _____ was a _____ (valuable, boring, etc.) experience.