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EARTHWORM DAY

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Using live animals in the elementary science classroom fosters enthusiasm and encourages curiosity. The earthworms discussed in this article, commonly called night crawlers, are easy to find in Iowa in moist garden soil or around lawns. Earthworms are often used as fishing bait and, because of this, are readily available at reasonable prices from commercial bait dealers or backyard entrepreneurs. Besides their availability and low cost, earthworms are relatively hardy and easily handled by elementary students. For these reasons, and because of the very important role earthworms play in the environment, they were selected to be the focus of the academic activities for one day in first and second grade classrooms. These activities have been used successfully for the past four years.

Earthworm Background Information

Edwards and Lofty (1972) and Wallwork (1983) have authored books that provide detailed information about earthworm biology. General information can be found in typical classroom references such as *The World Book Encyclopedia* (1989) or the *Young Student's Learning Library* (1988). Much of the information that follows was obtained from these four sources.

Earthworms have reddish-brown bodies that are made up of a series of similar segments called *somites*. A worm crawls by lengthening and narrowing its front part, pushing soil particles aside, then pulling up the hind part. Circular muscles surrounding the worm's body can make the body shrink or spread out. Longitudinal muscles that run the length of the body shorten or lengthen the worm. Little bristles, *setae*, attached to the segments help the worms move through the earth by preventing the worm from slipping.

Earthworms feel slimy to the touch. The pointed end of the earthworm is its anterior or "head end." If either the first few segments or the worm's head or tail are cut off, the worm can grow back new head or tail portions. This is called *regeneration*. An earthworm breathes through its thin skin. The skin is in contact with the air between the particles of soil. When the air spaces fill with water after a rain,

earthworms must come to the surface or they will drown. Earthworms become inactive if the soil dries out and will die if the soil becomes too dry and warm.

Earthworms have both male and female reproductive organs, but each worm must mate with another worm to form eggs. Generally, they mate at night. A few large somites, the *clitellum*, and other anterior segments secrete a cuff-like structure or bag that surrounds the body. In this bag, the eggs are laid. The cuff slides along the body and over the head as the worm moves. The cuff then closes into a *cocoon*, completely surrounding the eggs. After several weeks in the cocoon, the young worms hatch. They are small, but reach their full length in a few months.

Earthworms can be very helpful to farmers and gardeners. Their burrowing activities loosen, mix and allow air and rainwater to enter the soil. Earthworms can turn the soil over and break it up by eating it. As an earthworm tunnels, it can eat the soil in its path. The soil is ground up in the worm's digestive system. The plant matter in the soil is digested. The rest is cast out of the worm's body in little piles, called *castings*, on top of the ground. Earthworms come to the surface of the ground, typically at night, to feed on bits of leaves, grass and decayed plant matter. Earthworms are an important food for many species of birds, shrews, moles and other animals.

Activities

Using a whole language philosophy and its strategies, you can make your elementary science classroom an earthworm laboratory by centering all subject lessons for one day or theme period around earthworm activities. Some of the activities that have been used successfully are as follows:

- Brainstorm about earthworms or use students' knowledge of earth worms to create a concept map. Choose five to ten words from the wealth of responses to incorporate into poems (for some ideas see Birdd and Wagner, 1985) or individual/class stories.
- Transform a simple children's melody into a creepy-crawly earthworm song. Elaborate with hand motions and body movements. Add rhythm instruments, a piano or small keyboard, kazoos, harmonica and bells for hands-on experiences that stimulate musical talents and involvement.
- Supply each student with an earthworm to handle gently and observe. A rainy morning could become an instant field trip for capturing earthworms if bait shops or pet supply stores are not conveniently located. Look under leaves and along curbs of streets on damp and rainy mornings. Returning the earthworms to the environment can be an important lesson following the lab experience. Although most students are familiar with earthworms, careful observation will reveal to them details that most haven't noticed.

- Appoint each student to be a guardian for his or her "own" earthworm for the day. Create an activity where each guardian receives a pre-determined amount of play money to provide for the needs of the worm. Needs might include food, shelter and an earthworm "sitter" for recess and lunch breaks. Most students take this responsibility very seriously. Students claim ownership of their earthworm by giving it a name and an individual history.
- Design mathematics activities around the earthworm theme by creating worm story problems. Some that were used in second grade classes are as follows:
 1. Stephanie had fourteen earthworms. She gave seven of them to Katie. How many earthworms does Stephanie have left?
 2. Melissa bought some earthworms at the bait shop. She gave the clerk two quarters and three dimes. How much did the earthworms cost?
 3. There are 48 earthworms to put in boxes to be sold as bait for fishermen. If each box holds a dozen, how many boxes will there be?
- Check into the availability of films, videocassettes, filmstrips and audio cassette tapes that present factual information about earthworms. Write simple reports using the information gathered. Students might be asked to obtain data that provide answers to questions such as:
 1. What happens to earthworms in the winter?
 2. Do earthworms ever have adverse effects on the environment or negatively affect humans?
- Check the school library/media center for age-appropriate children's books about earthworms.
- Have students divide into cooperative learning groups to develop food chains that include the earthworm. Use pictures from old texts, magazines and newspapers to help with illustrations.
- Do an experiment where earthworms are placed on white paper plates divided into four equal sections. Soak one part with water, one with vinegar and another with saltwater, leaving the final area dry. Each student then places an earthworm in the center of a paper plate and observes its behavior. Have students discuss their observations and record their findings on the blackboard. Help students draw conclusions using their findings.

A number of earthworm activities might be attempted, limited only by your own creativity. Special activities might include the following:

- Have a guest speaker, such as a soil conservationist, talk to students about the importance of earthworms in maintaining soil in which plants grow and provide food for humans and other animals. Soil samples illustrating fertile, aerated and poor soil can be made

available for students to observe, describe and compare.

- Create a play with earthworms as the main characters. Long, white tube socks dyed brown and decorated with buttons and felt attachments help the characters come to life with little expense incurred.
- Use modeling clay to form lifelike replicas of earthworms. Make a model of an earthworm environment on a folding table incorporating the clay figures and other features of their natural settings.

Classroom Resources

Classroom resources dealing with the topic of earthworms can be found in school libraries, city libraries and university libraries. Some suggested sources are:

- Hess, L. 1979. *The Amazing Earthworm*. New York: Charles Scribner's Sons.
- Lauber, P. 1976. *Earthworms: Underground Farmers*. Champaign, IL: Garrard Publishing.
- Pringle, L. 1973. *Twist, Wiggle, and Squirm: A Book about Earthworms*. New York: Thomas Y. Crowell.
- The World Book Encyclopedia*. 1989. Vol. 6. Chicago: World Book.
- Young Students' Learning Library*. 1988. Vol. 7. Middleton, CT: Weekly Reader Books.

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- Edwards, C.A. and J.R. Lofty. 1972. *Biology of Earthworms*. London: Chapman and Hall.
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