



LIVING THINGS AND THEIR NEEDS

Animals' Needs

Written by Nancy Moreno, Ph.D., Barbara Tharp, M.S., and Paula Cutler, B.A.

from *Living Things and Their Needs Teacher's Guide* and for *Tillena Lou's Day in the Sun*.

BioEdSM

Teacher Resources from the
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The activities described in this book are intended for school-age children under direct supervision of adults. The authors, Baylor College of Medicine and the publisher cannot be responsible for any accidents or injuries that may result from conduct of the activities, from not specifically following directions, or from ignoring cautions contained in the text.

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Using Cooperative Groups

Cooperative learning is a systematic way for students to work together in groups of two to four. Quite often, early primary students need to have their own materials, but can work in groups to share ideas and to learn from one another. Through such interactions, students are more likely to take responsibility for their own learning. The use of cooperative groups provides necessary support for reluctant learners, models community settings where cooperation is necessary, and enables the teacher to conduct hands-on investigations in a more manageable environment.

Students wear job badges that describe their duties. Tasks are rotated within each group for different activities so that each student has an opportunity to experience all roles. Teachers even may want to make class charts to coordinate job assignments within groups.

Once a cooperative model for learning has been established in the classroom, students are able to conduct science activities in an organized and effective manner. All students are aware of their responsibilities and are able to contribute to successful group efforts.

• Asks questions

• Asks others to help

• Asks others to help

○ fold here ○

○ ○



Scientist Leader

• Gets the materials and returns materials

• Helps the leader

○ fold here ○

○ ○

Materials Scientist



• Tells the teacher when group is finished

• Writes or draws results

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○ ○



Scientist Recorder

• Follows the safety rules

• Directs the cleanup

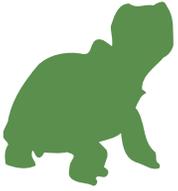
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Safety Scientist







My Science Journal

Name _____

Date _____

Project Name _____

DRAWING

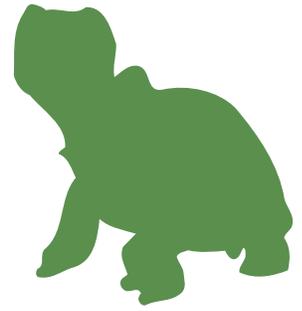
**KEY WORD
TO USE**

I OBSERVED . . .



Animals' Needs

Student teams will observe a worm model and a live worm, create worm terrariums, and observe worms over time.



Unlike plants, animals must rely on other organisms as sources of food. Food provides energy, chemicals necessary for life and some water. Most animals are adapted to eat only certain foods. Some animals are plant eaters, some eat other kinds of animals and others are able to use a variety of foods. All animals are “consumers” of energy sources.

Since most animals cannot digest all the food they eat, the leftovers are released back into the environment as waste. This waste serves as food for other kinds of organisms, such as bacteria and fungi.

Animals also need water. Water is essential for transporting nutrients and other chemicals inside animals' bodies and is important for chemical reactions inside cells. In addition, some animals are able to live in fresh or salt water.

Like water, the oxygen in air is essential for chemical reactions inside cells. Even plants need oxygen to live. Only a few kinds of microorganisms on Earth can survive in environments without oxygen.

Many animals also require safe places to rest, store their food, hide or nurture their young. These places vary from elaborate tunnels created by ant colonies to nests built by birds.

SETUP

This activity requires live earthworms, which need to be obtained prior to conducting this activity. Worms also can be obtained from bait shops or pet stores.

Part 1. Place candy worm models (or scrunched paper straw wrappers) in clear plastic cups (one worm model and cup per student). Cover with crumbled chocolate cookies (or graham crackers) to simulate soil.

Part 2. Place live earthworms in clear plastic cups (one worm and cup per student). Cover the worms with 1/4 cup of damp (not wet) soil. Let about 300 mL of tap water sit overnight to eliminate chlorine. Pour the prepared water into 6 cups (about 50 mL each) and into 6 spray bottles.

Part 3. In advance, collect six 2-liter plastic soft drink bottles and six 16-oz plastic bottles with caps (1 set per group). Cut the top 1/4 off of each 2-liter bottle. Use masking tape to cover the sharp edges. Prepare 6 plastic bags with about 1/2 cup of sand in each, and 6 plastic bags with 2 cups of potting soil in each. Place materials on trays in a central location.

Have students work in teams of 2–4 to share materials.

PROCEDURE

Part 1. Observing worm models

1. To stimulate student interest, ask, *What can you tell me about worms?*

CONCEPTS

- Animals have basic needs.
- Animals need air, water, food and a place to be.
- Animals can survive only in environments where all their needs are met.

SKILLS

Science: Observing, comparing, contrasting, recording data, measuring
Mathematics: Observing, sorting and classifying, comparing, contrasting, communicating, charting, sequencing

Language Arts: Listening, communicating, reading for information, identifying words, developing vocabulary, writing, using descriptive language, understanding word meanings, developing comprehension skills, following directions

TIME

Set-up: 5 minutes

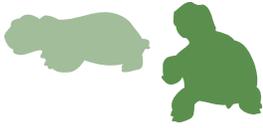
Class: 30 minutes plus 5 minutes each day for 2–4 weeks

MATERIALS

See p. 6.

HOW DO WORMS MOVE?

Worms' bodies are partitioned into fluid-filled segments. By contracting the segments in waves, worms are able to push and pull their way through soil. Small bristles on the segments help anchor worms' bodies as they move.



MATERIALS

- Masking tape
 - Paper towels
- Per group** (see Setup)
- 3 cups of potting soil
 - 2 sheets of black construction paper, 9 in. x 12 in.
 - 1/2 cup of crumbled dry leaves
 - 1/2 cup of oatmeal
 - 1/2 cup of sand
 - 1/2 cup of used coffee grounds
 - 2-liter plastic soft drink bottle
 - 16-oz plastic soft drink bottle with cap
 - Glue
 - Large rubber band #84 (to fit around the 2-liter bottle)
 - Plastic tray
 - Resealable plastic bag, 12 in. x 15 in. (gallon-sized, for soil)
 - Resealable plastic bag, 4 in. x 6 in. (quart-sized, for sand)
 - Spray bottle of prepared water and one cup of water
 - Strip of tagboard (or heavy paper), 10 cm x 70 cm (4 in. x 28 in.)

Per student (see Setup)

- 2 clear plastic cups, 9 oz
- 2 paper plates, 8 in.
- 1/4 cup chocolate cookie crumbs
- Candy “gummy” worm (or scrunched paper wrapper from drinking straw)
- Crayons or colored pencils
- Hand lens
- Live earthworm
- Metric ruler
- Copy of student sheets

How do they look? How do they feel? Where do worms live? Are worms plants or animals? Make a list of students’ ideas on the board. Tell students that they will be learning more about worms.

2. Distribute a prepared cup with worm model covered with cookie crumbs, magnifier, metric ruler, paper plate and a copy of the “My Worm Model” sheet to each student. Have students place their models on the paper plates.
3. Give students a few moments to examine the models using their hand lenses. Then have them make observations, using the questions on the student sheets. With younger students, you may want to read each question aloud as they work through the observations.

Part 2. Observing live worms and making comparisons

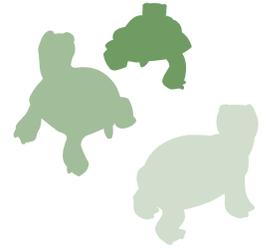
1. Show students how to handle live earthworms. Explain that worms have soft bodies and should be held gently. Because earthworms breathe through the skin, they need to be moistened frequently when removed from soil (about every 10 minutes). Gently dip a worm into a prepared cup of water (see Setup) to show students how to rinse off surface soil or to moisten the worms.
2. Distribute a cup with soil and a live worm, paper plate and copy of the “My Live Worm” sheet to each student. Give each group a cup of prepared water for rinsing and moistening the worms.
3. Have students gently place the worms on paper plates. Each student should use his or her hand lens to make observations and should complete a student sheet individually.
4. Once students have finished their observations, have them carefully place the worms back in the cups with soil.
5. Ask students, *Is the worm you have been observing alive? How do you know?* Help students conclude that the worm is alive because it moves, needs water and food, grows, etc. Ask, *What about the model worm? Is it alive? Why or why not?*
6. Create a class chart or Venn diagram (see “Logical Relationships, p. 7) to record and compare students’ observations about the models and living worms. Ask, *In what ways is the model worm like the living worm? In what ways are the two kinds of worms different?* Discuss the differences between living and nonliving things.

Note. If students will not be making worm terrariums on the same day, place earthworms in a container of damp (not wet) soil.

Part 3. Making terrariums

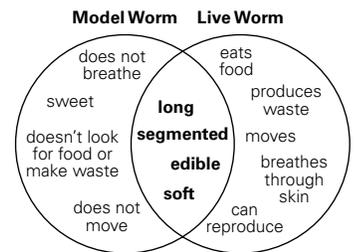
1. Explain to students that they will be preparing a place in which the earthworms can live. Ask, *What do earthworms need to live?* Remind students of the differences between the living and model worms.





2. Follow by asking, *Where do worms find their food? What do they eat? Where do worms find water?* Help students conclude that soil provides worms with most of the things they need.
3. Show students the materials they will need to build a terrarium: earthworm, prepared 2-liter bottle (container), 16-oz plastic bottle with lid, small bags of sand and soil, used coffee grounds, uncooked oatmeal, black paper, rubber band and water mister (loose materials on tray).
4. Begin to demonstrate how to prepare a terrarium—but carry out the steps in the wrong sequence. For example, place the container upside-down and set the other materials on top. Encourage students to volunteer ideas to help build the terrarium correctly (see sidebar).
5. Distribute the tagboard strips and copies of “Building a Terrarium” student sheets. Have students cut out the instruction cards from the sheets. Ask students to arrange the cards in logical order along the length of the tagboard strip (the strip may be folded in half three times to create eight equal spaces). Have students number the cards and glue them to the strip.
6. Have groups build the terrariums by following the instructions on the sequence strips. OR create a class chart with the steps listed for students to follow. Allow groups to assemble their terrariums.
7. Once the terrariums are complete (including the addition of earthworms), wrap each with black paper and secure with a rubber band. Label the terrariums with students’ names.
8. Have students remove the paper covering the terrariums and observe their worms’ homes daily for 2–4 weeks. Since the smaller bottle takes up much of the space within the terrarium, students will be able to observe the activities of the earthworms. They should note worm behavior and changes in the habitat, either by drawing what they see or writing descriptive phrases in their journals. Once daily observations are complete, students should cover the terrariums with the paper.
9. Help students monitor the moisture content of the terrariums and mist the top layer, if necessary. Do not allow students to over water. The soil should be damp, but not wet.
10. During and after the 2–4 week period, discuss students’ observations. Help students understand that worms, like all animals, need water and food to survive. Have students identify which substances in the terrarium are food for worms (leaves, coffee grounds and oatmeal). As an assessment, consider having students draw a detailed, labeled picture of the worm habitat and describe or draw all of the things that the worms need to survive.

LOGICAL RELATIONSHIPS



STEPS TO PREPARE THE TERRARIUM

1. Pour the bag of sand into the large container.
2. Place the small bottle (with its cap on) inside and at the center of the container.
3. Pour the bag of soil around the small bottle and on top of the sand.
4. Cover the soil with a thin layer of uncooked oatmeal.
5. Cover the oatmeal with a thin layer of coffee grounds.
6. Carefully place the worms on top of the coffee grounds.
7. Gently spray the worm and coffee ground layer with water.
8. Cover the moist layer with leaves.

EARTHWORMS . . .

An earthworm has no eyes or ears. It burrows through soft soil and eats dead plant and animal material. This material is digested as it passes through the worm’s body. Waste is excreted at the tip of the tail. A worm produces its own weight in waste, known as castings, in just one day.





My Worm Model

Study your worm carefully. Draw a picture of your worm below.

1. What color is your worm?_____
2. How long is your worm?_____
3. How wide is your worm?_____
4. Can you tell its front from its back?_____
5. Can you tell its top from its bottom?_____
6. Does your worm have eyes?_____
7. Does your worm have a mouth?_____
8. Does your worm have a nose?_____
9. Does your worm have legs?_____
10. How many segments does your worm have?_____
11. How does it move?_____
12. How does it smell?_____
13. How does it feel?_____



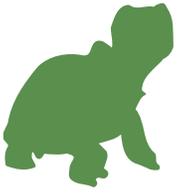
My Live Worm



Study your worm carefully. Draw a picture of your worm below.

1. What color is your worm?_____
2. How long is your worm?_____
3. How wide is your worm?_____
4. Can you tell its front from its back?_____
5. Can you tell its top from its bottom?_____
6. Does your worm have eyes?_____
7. Does your worm have a mouth?_____
8. Does your worm have a nose?_____
9. Does your worm have legs?_____
10. How many segments does your worm have?_____
11. How does it move?_____
12. How does it smell?_____
13. How does it feel?_____

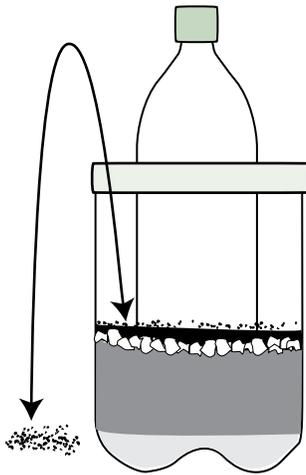




Building a Terrarium

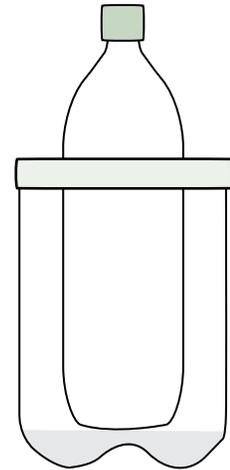
Step _____

Cover the oatmeal with a thin layer of coffee grounds.



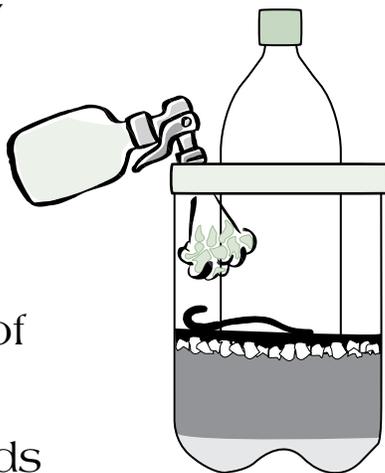
Step _____

Place the small bottle (with its cap on) inside and at the center of the container.



Step _____

Gently spray the worm and layer of coffee grounds with water.



Step _____

Pour the bag of soil around the small bottle and on top of the sand.

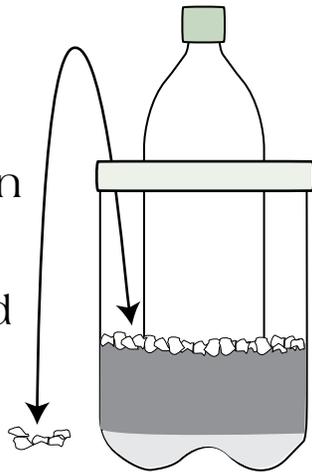


Building a Terrarium



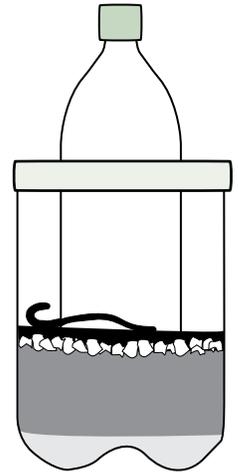
Step _____

Cover the soil with a thin layer of uncooked oatmeal.



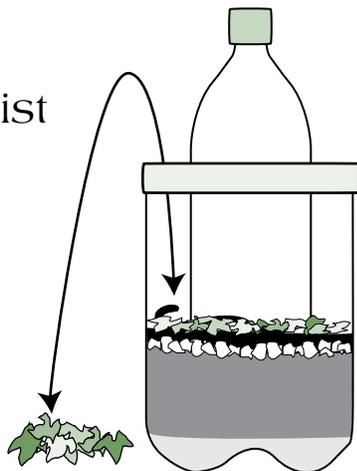
Step _____

Carefully place the worms on top of the coffee grounds.



Step _____

Cover the moist layer with leaves.



Step _____

Pour the bag of sand into the large container.

