

Mighty Earth Movers

Objective

Students will create a worm habitat and keep a journal to monitor changes. They will observe the worms and measure them.

Materials

- Unit of fishing worms, like Canadian night crawlers (available through science supply catalogs)
- 2-3 clean, clear 16-ounce containers (drinking glass, tall salsa jar, mayonnaise jar)
- Dark cloth or construction paper
- Habitat materials (unfertilized potting soil, dead crushed leaves, garden soil, sand, cornmeal, bonemeal) tracing paper rocks or coarse gravel

Procedures

1. Read and discuss background and vocabulary.
 - Students will use online or library references to find out what foods worms do and do not eat. As a class, find out if worms are herbivores, carnivores, or omnivores. What habitat do worms live in?
2. Show students the worms you have ordered ahead of time. Ask students what the worms will need to survive, based on their research. Make a list of the materials they will need.
 - Divide students into groups of two or three official worm watchers. For each group, provide one 16-ounce container, a dark cloth to cover the container, two worms, and habitat materials.
 - Students will pour the habitat materials into the containers in equal parts, with crushed leaves or unfertilized potting soil on top and the rocks or coarse gravel on bottom.
 - Students will use spray bottles to lightly spritz the top layer of the worm habitat before adding the worms.
 - Students will cover their container with dark cloth or construction paper, and place it in a cool, dark part of the classroom.
 - Students will keep their habitats moist but not wet. Note: Worms will try to crawl out if the habitat is too wet.
 - Students should also make sure the worms have a steady supply of leaves or cornmeal for food.

Oklahoma Academic Standards

PRE-KINDERGARTEN

Number & Operations: 1.1; 2.2,4. Algebraic Reasoning: 1.1. Measurement: 2.1,2,3. Data: 1.1,2

Speaking and Listening: R.1,2,3,4; W.1,2.
Reading and Writing Process: R;W. Critical Reading and Writing: W. Vocabulary: R.1,2. Research: R; W

KINDERGARTEN

Life Science: 1-1; Earth Science: 2-2; 3-1
Number & Operations: 1.1,2,4,5,6,8.
Algebraic Reasoning: 1.1. Measurement: 2.2,1,2,3,4. Data: 1.1,2,3
Speaking and Listening: R.1,2,3,4; W.1,2.
Reading and Writing Process: R.1,3; W.1,2,3.
Critical Reading and Writing: W. Vocabulary: R.1,2. Research: R.1,2; W.1,2

GRADE 1

Life Science: 1-1
Measurement: 2.1,2,3,4,5. Data: 1.1,2,3
Speaking and Listening: R.1,2,3,4; W.1,2.
Reading and Writing Process: R.1,3; W.1,2,3.
Critical Reading and Writing: W.1,2.
Vocabulary: 1,3. Language: R.3. Research: R.1,2,3; W.1,2,3

GRADE 2

Life Science: 4-1
Measurement: 2.1,3. Data: 1.1,2,4
Speaking and Listening: R.1,2,3,4; W.1,2.
Reading and Writing Process: R.3; W.1,2.
Critical Reading and Writing: R.4; W.1,2.
Vocabulary: 1,3. Language: R.3. Research: R.1,2,3; W.1,2,3

GRADE 3

Life Science: 1-1; 2-1; 4-3,4
Measurement: 2.3,4,5. Data: 1.1,2
Speaking and Listening: R.1,2,3; W.1,2.
Reading and Writing Process: R.3; W.1,2.
Critical Reading and Writing: R.4; W.1,2.
Vocabulary: 1,3. Language: R.3. Research: R.1,2,3,4; W.1,2,3

- Hand out the “Worm Watcher Worksheets.” Students will complete the blanks individually for each day of observation.
 - On the second day, students will remove the dark cloths and tape tracing paper around the containers.
 - Students will trace the layers and tunnels the worms have created.
 - Students will carefully remove the worms and place them on damp paper towels to keep them moist.
 - Students will examine the worms using magnifying glasses or microscopes.
 - After a week or so, after students have completed all their activities, students will dump the entire contents of the containers into a garden or a compost pile so the worms can do their work in their true habitat.
3. Students will work in groups to conduct the following math activities with the worms.
 - Weigh the worms using scales.
 - Use rulers to carefully measure the worms’ lengths.
 - Create graphs to compare the worms’ lengths and weights with those in other groups.
 - Convert measurements from one unit of measurement to another, e.g., inches to centimeters.
 4. Students will conduct races with their worms, using a stopwatch to time the worms’ movements.
 5. Younger students will use the worms to conduct the following math activities:
 - Order the worms from shortest to longest.
 - Count the worms to find out how many worms are in their worm habitat.
 - Measure the worms using nonstandard units of measurement.
 6. Students will keep journals to record their observations of the worms. Students will:
 - Describe the worms, using their five senses. What do they look like? How do they feel? Do they have a smell? Do they make sounds?and write adjectives describing the worms.
 - Write adjectives to describe the worms.
 - Use a thesaurus to look up synonyms for their adjectives.
 - Write stories about the worms. The stories may be fiction or nonfiction.
 - Write descriptions of the worms’ movements. Do they ever move backwards?
 7. Discuss figurative language statements related to worms, e.g., “The early bird gets the worm.” or “Bookworm.”
 - Students will brainstorm what these terms might mean then look them up online to see if their predictions were correct.
 - Students will write stories using these figurative language statements.
 8. Students will read and compare at least two books about worms. (See the “Additional Reading” list included with this lesson.) What information is the same? What information is different?
 - Students will create Venn diagrams to compare the books.
 - Discuss the differences between the fiction and non-fiction stories. How does the information in the books compare to the information the students have recorded in their own journals?
 9. Students will use online or library resources to research the different names for earthworms (night crawlers, red wigglers, etc.) and find out where the names originated.
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Might Earth Movers

Background

The lowly earthworm is a mighty earth mover. Earthworms live underground in burrows. The tunnels they make can be as much as six feet long. The tunnels help air and water get into the soil. The naturalist Charles Darwin proposed there would be no topsoil without earthworms. He believed topsoil had to be processed and re-processed through the bodies of worms. He collected and weighed worm castings, or waste material, and estimated that earthworms bring between 7 1/2 and 18 tons of material to the surface in each acre of land.



When it rains, earthworms emerge from their burrows, not because they are drowning, but because they are starved for oxygen. Earthworms breathe through their bodies. They have no ears but are very sensitive to vibrations.

For farmers, earthworms are living plows. Commercial earthworm farms in California and the southern states ship earthworms and earthworm eggs to farmers all over the United States. Worm manure, sacks of sifted worm castings, is sold to florists for fertilizer.



Vocabulary

burrow—a hole in the

ground made by an animal for shelter or protection

clitellum—a raised band or ring encircling the body of a worm.

process—to change or prepare by special treatment

topsoil—surface soil usually including the rich upper layer in which plants have most of their roots and which the farmer turns over in plowing

worm castings—the excrement of an earthworm) that is cast out or off



Worm Watcher Worksheet



Day 1 _____ date	Day 2 _____ date	Day 3 _____ date	Day 4 _____ date	Day 5 _____ date	
<p>Before you lift the cloth each day, hypothesize what you will see. Write your hypothesis in a complete sentence.</p>	<p>Give your worms names. Write the names below.</p>	<p>Use a thesaurus and find five words that could take the place of the word "dig." Write the words in this block.</p>	<p>Design a badge that shows you are an official worm watcher. Be creative. Use crayons, markers and construction paper.</p>	<p>Use a reference to find a picture or drawing of an earthworm. Draw an earthworm along the left side of the worksheet. Label one of its clitellum.</p>	<p>Earthworms can move soil particles up to 40 times their weight. Use this formula to find out how much soil you could move if you were a worm.</p> <p>$40 \times \underline{\hspace{1cm}} = \underline{\hspace{1cm}}$</p>

Jelly Worms

100 bendy straws
Large cup or empty juice containers with the top cut off.
1 large (6 oz) box raspberry jello
3 envelopes of unflavored gelatin (4 come in a box, so 1 box will work)
3/4 c heavy cream
3 cup boiling water
15 drops green food coloring

1. Boil the water, and add the jello packets. Let this mix cool a little, about 20 minutes in the refrigerator.
2. Add cream and food coloring. Mix well.
3. Place the straws (bendy side down) in a large cup or orange juice carton.
4. Pour in the mix.
5. Cool for several hours or overnight.
6. At least an hour before serving, remove from straws by run a few straws at a time under hot running water for 2-4 seconds.
7. Gently push the worm out of the straw. Wiggle it out a bit. Let the worms chill for for at least 30 minutes before serving.