

Photo Description



This image shows an earthworm on grass and soil. You can see the earthworm's long, tube-shaped body divided into ring-like segments. The earthworm is brown in color and appears to be moving across the ground where it naturally lives.

Scientific Phenomena

Anchoring Phenomenon: Why do earthworms live in soil and come out on wet days?

Earthworms are living creatures that need moisture to survive. Their skin must stay wet to breathe, since earthworms absorb oxygen through their skin rather than using lungs like humans do. When soil gets too dry, earthworms move deeper underground or come to the surface to find moist areas. This behavior helps them find the conditions they need to live and thrive in their habitat.

Core Science Concepts

- * Living Things Have Basic Needs: Earthworms need moisture, soil, and organic matter (decomposing plants and animals) to survive, just as all living things need food, water, and shelter.
- * Habitats Support Living Things: Soil and leaf litter are the earthworm's habitat—the place where it finds food and shelter. Different animals live in different habitats.
- * Organisms Have Observable Features: Earthworms have segmented bodies (ring-like sections), no legs, and moist skin that help them move through soil and breathe.
- * Decomposition and Nutrient Cycling: Earthworms eat dead plant material and break it down, returning nutrients to the soil so new plants can grow. This makes earthworms important helpers in nature.

Pedagogical Tip:

Second graders learn best through concrete, hands-on observation. Rather than just showing this photo, consider bringing in live earthworms in a clear container so students can observe them moving, burrowing, and responding to light and moisture. This multisensory experience deepens understanding of how earthworms behave and interact with their environment.

UDL Suggestions:

To support diverse learners, provide multiple means of representation: (1) Use large, labeled diagrams showing earthworm body parts for visual learners; (2) Offer tactile experiences like feeling moist soil and observing earthworm movement for kinesthetic learners; (3) Create a "vocabulary word wall" with pictures and simple definitions for English Language Learners. Allow students to demonstrate understanding through drawing, verbal explanation, or physical modeling rather than written responses only.

Zoom In / Zoom Out

Zoom In: Microscopic Level

If we could look at an earthworm's skin under a microscope, we would see thousands of tiny holes called pores. Earthworms breathe through these pores by absorbing oxygen directly from the air and soil water into their blood. Unlike humans who have lungs, earthworms have no special breathing organs—their whole moist skin is like one big lung! This is why earthworms must always stay damp; dry skin means no oxygen can get through.

Zoom Out: Ecosystem and Food Web

Earthworms are one important part of a much larger soil ecosystem. When earthworms eat dead leaves and plants, they break them into tiny pieces and poop out nutrient-rich soil. Plants use this rich soil to grow strong. Animals eat the plants. When those animals die, earthworms help decompose them again. This cycle keeps repeating, connecting earthworms to plants, animals, and the whole garden or forest ecosystem. Without earthworms, soil would be poor, plants wouldn't grow well, and the whole ecosystem would struggle.

Discussion Questions

1. What do you think the earthworm's ring-like body parts help it do? (Bloom's: Analyze | DOK: 2)
2. Why do you think an earthworm needs to stay in moist soil? (Bloom's: Understand | DOK: 2)
3. How does the earthworm help the plants and soil in a garden? (Bloom's: Evaluate | DOK: 3)
4. If you found an earthworm on dry pavement, what would you predict would happen to it, and why? (Bloom's: Predict/Analyze | DOK: 2)

Potential Student Misconceptions

Misconception 1: "Earthworms are insects like bugs and beetles."

Clarification: Earthworms are not insects. They are a different kind of animal called worms. Insects have six legs, wings, and hard outer shells. Earthworms have no legs or wings and soft, squishy bodies divided into rings. Both live in or on soil, but they are very different animals.

Misconception 2: "Earthworms choose to come above ground when it rains because they like playing in puddles."

Clarification: Earthworms don't come up for fun. Heavy rain floods their underground tunnels with water, making it hard for them to breathe and find air pockets. They move to higher ground to escape drowning. When soil dries out too much, they also move up to find moisture. Both movements are about survival, not choice or play.

Misconception 3: "If you cut an earthworm in half, you get two new earthworms."

Clarification: If an earthworm is cut in half, it usually dies—it doesn't grow two new worms. Earthworms can survive if they lose their tail end because their important organs are near the head, but they cannot regenerate an entire new body from a cut piece. Earthworms are living creatures that need care and respect.

Extension Activities

1. Earthworm Habitat Observation Box: Create a "worm farm" in a clear plastic container with layers of soil, sand, and leaf litter. Add 3-4 earthworms and observe them for two weeks. Have students draw pictures daily of where the worms are, what they're doing, and how the soil layers change. This shows how earthworms tunnel and mix soil.

2. Soil Exploration Walk: Take students outside to a garden, park, or natural area. Have them gently dig in the soil (with permission) to find earthworms and other decomposers. Students can count the worms, observe their size and color, and discuss what they find nearby (leaves, plant roots, other insects). This builds awareness of earthworms as part of a real ecosystem.

3. Life Cycle Drawing and Sequencing: Show students pictures of earthworms at different life stages and have them draw and arrange them in order (egg, baby worm, adult worm). Discuss how living things grow and change, connecting to the earthworm life cycle.

Cross-Curricular Ideas

Math Connection: Measurement and Counting

Have students measure earthworms using non-standard units (like paper clips or blocks) and standard units (like centimeters). Create a simple chart or graph showing the different lengths of worms found in the classroom worm farm. Students can count segments on a worm's body and practice basic addition ("This worm has 12 segments, and that worm has 15 segments. How many segments in all?").

ELA Connection: Narrative and Descriptive Writing

Read *Diary of a Worm* together, then have students write or draw their own "Diary Entry from an Earthworm's Day." What does the worm see, feel, and eat? Where does it tunnel? This combines creative thinking with descriptive vocabulary about the earthworm's life and habitat.

Social Studies Connection: Jobs and Community Helpers

Discuss how farmers and gardeners depend on earthworms to keep soil healthy. Create a simple "Helpers in Our Community" poster showing the earthworm as a garden helper. Connect this to the idea that all living things have a job in nature, helping other living things survive—just like community workers help people.

Art Connection: Segmented Body Sculptures

Have students create earthworms using craft materials: pipe cleaners, playdough rolled into segments, or paper rolled into tubes and painted. Students can count and decorate segments, then arrange their worms on a painted "soil and grass" background. This builds fine motor skills while reinforcing the concept of segmented body structure.

STEM Career Connection

Soil Scientist (or Pedologist)

Soil scientists study dirt! They dig in soil, look at what lives in it, and test it to see if it's healthy for plants to grow. Soil scientists might work on farms, in parks, or in laboratories. They ask questions like: "Are there enough earthworms in this soil? Is the soil too wet or too dry? What's growing here?" These scientists help make sure gardens, farms, and forests stay healthy.

Average Annual Salary: \$65,000 USD

Entomologist (Insect and Invertebrate Scientist)

An entomologist studies small creatures, including earthworms and other animals that live in soil. They observe how these animals behave, what they eat, and how they help or hurt gardens and farms. Some entomologists work outdoors collecting and studying creatures, while others work in labs with microscopes. They might help farmers grow better crops by understanding the creatures in soil.

Average Annual Salary: \$68,000 USD

Environmental Scientist

Environmental scientists study how living things and nature systems work together. They might study ecosystems like forests and gardens, and learn how animals like earthworms help keep everything healthy and balanced. Environmental scientists work outside and in offices, protecting nature and making sure plants and animals have what they need to survive. Some help protect endangered animals or clean up polluted soil.

Average Annual Salary: \$73,000 USD

NGSS Connections

Performance Expectation:

2-LS2-1: Plan and conduct investigations to provide evidence that plants get the materials they need for growth chiefly from air and water, and that animals get the materials they need from food.

Disciplinary Core Ideas:

- 2-LS1.A Structure and Function: All organisms have external parts. Different animals use their body parts in different ways to see, hear, grasp objects, protect themselves, move from place to place, and seek, find, and take in food, water and air.
- 2-LS2.A Interdependent Relationships in Ecosystems: Plants depend on animals for pollination or seed dispersal, and animals depend on plants for food and other materials.

Crosscutting Concepts:

- Structure and Function The earthworm's segmented body structure allows it to move through soil efficiently.
- Systems and System Models Earthworms are part of a soil ecosystem where living and nonliving things interact.

Science Vocabulary

- * Earthworm: A small animal with a long, soft body divided into rings that lives in soil and eats dead plants.
- * Segments: The ring-like sections that make up an earthworm's body.
- * Habitat: The place where an animal lives and finds food, water, and shelter.
- * Decompose: To break down dead plants and animals into smaller pieces that help make soil rich for new plants.
- * Organism: Any living thing, like an animal, plant, or insect.
- * Moist: A little bit wet; damp.

External Resources

Children's Books:

- Diary of a Worm by Doreen Cronin, illustrated by Harry Bliss (engaging narrative from a worm's perspective)
 - The Worm Family by Tony Johnston, illustrated by Jill McDonald (story about earthworm family life)
 - Wonderful Worms by Linda Glaser, illustrated by Loretta Holland (informational picture book about earthworm ecology)
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Teacher Notes: This lesson works best when paired with hands-on observation and outdoor exploration. Second graders are naturally curious about small creatures, so encourage careful, respectful handling of earthworms. Emphasize that earthworms are helpful partners in nature, not something to fear.