

Photo Description



This image shows a long, brown earthworm stretching across green grass and mulch. You can see the earthworm's smooth, bumpy body divided into ring-like sections called segments. The earthworm is resting on soil and plant material, which is its natural home.

Scientific Phenomena

Anchoring Phenomenon: Why do earthworms come out after rain and move across the ground?

Earthworms live underground in soil where they burrow and eat decomposing plant material. When heavy rain falls, water fills their underground tunnels, making it hard to breathe. Earthworms must move to the surface to find air and drier soil. Additionally, rain-softened soil is easier for earthworms to tunnel through. This observable behavior—finding earthworms on wet ground—is a perfect entry point for First Graders to investigate how animals respond to their environment.

Core Science Concepts

- * **Animal Habitats:** Earthworms live in soil, an environment that provides food, shelter, and moisture. Understanding that animals need specific places to live is foundational to ecology.
- * **Body Structure and Function:** Earthworms have segmented bodies (rings) that help them move and bend through soil. Their skin must stay moist to absorb oxygen, which connects structure to survival needs.
- * **Decomposition and Ecosystems:** As earthworms tunnel and eat dead leaves and plants, they break down organic matter and return nutrients to the soil. This makes them essential for plant growth and healthy ecosystems.
- * **Animal Behaviors and Adaptations:** Earthworms respond to environmental changes (like rainfall and light) by moving. This is an example of how animals adapt their behavior to survive.

Pedagogical Tip:

For First Grade, avoid overly complex vocabulary like "respiration" or "decomposition." Instead, use concrete language: "Earthworms need air to breathe," "Earthworms eat dead leaves," and "Earthworms help plants grow." Encourage students to observe earthworms directly through classroom exploration rather than relying solely on pictures. Hands-on observation deepens understanding and maintains engagement.

UDL Suggestions:

Multiple Means of Representation: Provide a labeled diagram showing earthworm body parts alongside the photograph. Use bright colors to highlight segments and important features.

Multiple Means of Engagement: Allow kinesthetic learners to act out how earthworms move by doing "earthworm stretches" on the floor. This multi-sensory approach supports diverse learners.

Multiple Means of Expression: Accept student responses as drawings, verbal descriptions, or physical demonstrations—not just written answers. This honors different communication styles typical of First Grade.

Zoom In / Zoom Out

Zoom In: Earthworm Skin and Breathing

Earthworms don't have lungs like we do! Instead, they breathe through their skin. Their skin is covered with tiny blood vessels that absorb oxygen from the air (or water) around them. If you looked at earthworm skin under a microscope, you would see it is very thin and smooth, which helps oxygen pass through. This is why earthworms must stay moist—dry skin cannot absorb oxygen, and the earthworm cannot breathe. When rain makes the soil soggy, earthworms come to the surface to get air because their underground tunnels fill with water.

Zoom Out: Earthworms in the Garden and Forest Ecosystem

Earthworms are tiny workers in a huge system! As earthworms burrow through soil and eat dead leaves, they break down plant material and mix nutrients back into the earth. This helps gardens and forests stay healthy and strong. Without earthworms, dead leaves would pile up, and new plants wouldn't have the nutrients they need to grow. Earthworms also loosen the soil, which helps water reach plant roots and allows air to enter the ground. When we zoom out and look at the whole forest or garden, earthworms are one of many animals—beetles, bacteria, fungi—all working together to recycle dead things and keep the ecosystem alive.

Discussion Questions

1. What do you think the earthworm is doing on top of the grass? Why might it have come out of the soil?
(Bloom's: Comprehend | DOK: 1)
2. How does the earthworm's long, wiggly body help it move through soil?
(Bloom's: Analyze | DOK: 2)
3. What do you think earthworms eat, and why is that important for plants?
(Bloom's: Evaluate | DOK: 3)
4. If you were an earthworm, what would you need to stay alive and healthy underground?
(Bloom's: Create | DOK: 3)

Potential Student Misconceptions

Misconception 1: "Earthworms come out of the ground because they're drowning."

Clarification: Earthworms don't breathe the same way fish do. They breathe through their skin and need moisture to do this. When soil floods with heavy rain, earthworms move to the surface to find air-filled spaces in the soil. They're looking for better conditions to breathe, not escaping drowning. Help students understand that moisture is good for earthworms, but waterlogged soil without air pockets is not.

Misconception 2: "Earthworms are insects like ants or beetles."

Clarification: Earthworms are not insects. Insects have six legs and hard outer shells. Earthworms have no legs and a soft, squishy body made of segments. Earthworms belong to a different animal group. You can sort pictures of insects and non-insects with students to reinforce this concept.

Misconception 3: "Earthworms eat dirt."

Clarification: Earthworms don't eat soil itself. They eat dead leaves, dead plant roots, and decaying material mixed into the soil. As they eat and digest this material, it breaks down into smaller pieces and becomes part of the soil, but the earthworm isn't eating the dirt—it's eating the food in the dirt.

Extension Activities

Activity 1: Earthworm Observation Container ("Worm Farm")

Layer soil, sand, and compost in a clear plastic bottle or jar. Add 2-3 earthworms and damp leaves. Keep the container in a cool, dark place. Students observe for one week, recording how earthworms burrow and mix soil layers. Discuss how earthworms help the soil. Safety note: Ensure earthworms are returned to outdoor soil after observation.

Activity 2: Earthworm Movement Exploration

Give students yarn or string to represent earthworm bodies. Have them lay it on the ground and discuss the segments. Then, students move like earthworms across the floor using stretching and contracting motions. Discuss which body movements help them travel. Connect this to earthworm adaptations.

Activity 3: Soil Scavenger Hunt

Take students outside with magnifying glasses to observe soil and find evidence of earthworms (tunnels, casts, etc.). Have them draw pictures of what they observe. Return to class and create a class "soil home" chart showing what earthworms need to survive.

Cross-Curricular Ideas

Math Connection: Measuring and Counting Segments

Provide students with images or plastic earthworm models and have them count the segments. Create a bar graph comparing the lengths of different earthworms (using string cut to different lengths). Students can practice measuring using non-standard units (like paper clips or their fingers) and compare which earthworm is longest or shortest. This integrates measurement, counting, and data representation.

ELA Connection: "If I Were an Earthworm" Creative Writing

Students write or dictate a simple story from an earthworm's perspective: "My name is Wiggle. I live underground. I eat dead leaves. I help the soil..." This can be illustrated with drawings of the underground habitat. Create a class book of earthworm stories to share during read-aloud time. This develops narrative writing, perspective-taking, and vocabulary reinforcement in a meaningful context.

Social Studies Connection: Jobs That Help the Earth

Connect earthworms to people who help gardens and farms grow. Discuss gardeners, farmers, and soil scientists who study earthworms and use them to make soil healthy. Talk about how taking care of the earth is important work. Students can draw pictures of themselves as garden helpers or farmers and share what job they would do to care for plants and soil.

Art Connection: Earthworm Crafts and Habitat Dioramas

Students create earthworms using brown paper, yarn, or clay, segmenting them with markers or wrapped string to show body rings. They can then build a shoebox diorama of an earthworm's underground home, layering soil, sand, dead leaves, and rocks. Display the dioramas and have students give tours explaining what earthworms need to live. This combines fine motor skills, creativity, and reinforcement of habitat concepts.

STEM Career Connection

Soil Scientist / Pedologist

Soil scientists study dirt! They dig in the ground, look at soil under microscopes, and learn about earthworms, bacteria, and other tiny creatures that live in soil. Soil scientists help farmers grow healthy crops and help protect forests and gardens. They ask questions like: "What's in this soil? Are earthworms happy here? How can we make the soil better?" If you love digging in the dirt and asking questions about nature, this job might be for you!

Average Annual Salary: \$65,000–\$75,000 USD

Environmental Biologist

Environmental biologists study animals and plants and how they live together in nature. Many environmental biologists work with earthworms and soil creatures to understand how ecosystems stay healthy. They might work in forests, gardens, farms, or laboratories. They care about protecting nature and making sure animals have safe homes.

Average Annual Salary: \$68,000–\$85,000 USD

Entomologist (Bug and Invertebrate Scientist)

Entomologists study insects and other small animals without backbones, like earthworms! Even though earthworms aren't insects, scientists who love studying earthworms and how they help nature often work as entomologists or invertebrate biologists. They might teach in universities, work for nature centers, or help gardens and farms use earthworms to improve soil.

Average Annual Salary: \$63,000–\$80,000 USD

NGSS Connections

Performance Expectation:

1-LS1-1: Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs.

Disciplinary Core Ideas:

- 1-LS1.A - All organisms have external parts. Different animals use their 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.
- 1-LS1.B - Animals have basic needs, which are met by obtaining food, water, air, and a suitable place to live. Plants need water, air, and light. Different plants put their roots, stems, and leaves in different places that help them get what they need to grow.

Crosscutting Concepts:

- Structure and Function - The shape and stability of structures of natural and designed objects are related to the materials from which they are made and the way that object is used.
- Patterns - Patterns in the natural world can be observed and used as evidence.

Science Vocabulary

- * Earthworm: A long, soft animal with a segmented body that lives in soil and helps plants grow.
- * Segments: The ring-like sections that make up an earthworm's body, helping it bend and move.
- * Soil: The dark, crumbly material on the ground where earthworms live and plants grow roots.
- * Burrow: To dig a tunnel or hole under the ground where animals can live and hide.
- * Decompose: To break down or rot, like when dead leaves turn into soil.
- * Habitat: The place where an animal lives and finds everything it needs to survive.

External Resources

Children's Books:

- An Earthworm's Life* by Rebecca Stefoff (part of the "Animals and Their Habitats" series—excellent for First Grade)
- The Earthworm* by Ron and Atie Hennessy (simple, illustrated facts)
- Wonderful Worms* by Linda Glaser (explores the benefits of earthworms in gardens)

Note to Teacher: This lesson anchors to a real-world phenomenon students may observe after rain, making it relatable and inquiry-driven. Consider connecting this unit to a broader study of soil, decomposition, and garden ecosystems throughout the spring season.