Earthworm

Life Science | Lesson Guide

5th Grade

Photo Description

This image shows an earthworm on soil and grass. Earthworms are long, tube-shaped animals with segmented bodies divided into ring-like sections. You can see the earthworm's moist, reddish-brown skin, which helps it breathe and move through soil.

Scientific Phenomena

Anchoring Phenomenon: Why do earthworms come to the surface, especially after rain?

Earthworms live underground where the soil provides moisture and food (decomposing plants and animals). When heavy rain occurs, water fills the air pockets in soil, reducing the oxygen available for the worm to breathe through its skin. Earthworms move to the surface to access fresh air. Additionally, the loose, wet soil makes it easier for worms to move horizontally on the ground rather than tunnel downward. This behavior demonstrates how organisms respond to environmental changes to meet their basic needs for survival.

Core Science Concepts

* Organism Adaptation: Earthworms have special physical features suited to their environment—a moist skin for breathing, segmented body for flexible movement, and no eyes but light-sensitive cells for sensing danger.

* Habitat and Environment: Earthworms depend on specific soil conditions (moisture, darkness, organic matter) to survive. Changes in their habitat trigger behavioral responses.

* Decomposition and Food Chains: Earthworms break down dead plant material, returning nutrients to soil and supporting plant growth. They are a crucial part of the ecosystem's nutrient cycle.

* Animal Behavior and Survival: Earthworms exhibit instinctive behaviors (moving toward moisture, avoiding light) that increase their chances of survival.

Pedagogical Tip:

When teaching about earthworms, create a "worm hotel" (clear container with alternating layers of soil and sand) so students can observe tunneling behavior over weeks. This concrete, visual experience helps fifth graders understand abstract concepts like habitat requirements and organism behavior far better than pictures alone. Allow students to make predictions before observations and record what they notice daily in a science journal.

UDL Suggestions:

To support diverse learners: (1) Representation: Provide both visual diagrams and tactile models of earthworm anatomy; include a video showing earthworm movement to support visual learners. (2) Action & Expression: Allow students to draw, build models with clay, or write descriptions of earthworms based on their observations—not just answer written questions. (3) Engagement: Connect earthworms to student interests (gardening, composting, pets) and allow choice in how they demonstrate learning (poster, comic strip, video, presentation).

Discussion Questions

1. "What do you think the earthworm needs from the soil to survive, and how might rain change what it finds there?" (Bloom's: Analyze | DOK: 3)

2. "How is an earthworm's body special or different from yours, and what do you think each part helps it do?" (Bloom's: Understand | DOK: 2)

3. "If all the earthworms disappeared from a garden, what might happen to the plants growing there? Why?" (Bloom's: Evaluate | DOK: 3)

4. "Earthworms move away from light even in the dark. How might this behavior help them stay safe?" (Bloom's: Apply | DOK: 2)

Extension Activities

1. Design a Worm Habitat Experiment: Students construct a clear "worm hotel" using a clear container, soil, sand, and live earthworms (if permitted by school policy and handled respectfully). Over 2-3 weeks, students observe and sketch tunnel patterns, measure worm movement, and test variables (Does a worm prefer wet or dry soil? Does it move toward or away from light?). Students create a poster or digital presentation of their findings.

2. Decomposition Investigation: Students place dead leaves in a clear container with earthworms and soil, and another container without worms. Over 4-6 weeks, they compare how quickly the leaves break down in each container, drawing conclusions about the earthworm's role in decomposition. This connects to nutrient cycling and food webs.

3. Earthworm Observation Walk & Data Collection: Take students on a supervised outdoor walk after rain to safely observe earthworms in their natural habitat. Students collect data on location (grass, concrete, soil), ground conditions (wet, dry), and time of day. Back in class, students create graphs or charts showing patterns and discuss why earthworms appear in certain places.

NGSS Connections

Performance Expectation:
5-LS1-1: Support an argument that plants get the materials they need for growth chiefly from air and water.

Disciplinary Core Ideas:
- 5-LS1.A - Structure and Function (organisms have specific body structures that support survival)
- 5-LS1.C - Organization for Matter and Energy Flow in Organisms (decomposers break down dead matter)
- 3-LS4.C - Adaptation (organisms have inherited traits that help them survive)

Crosscutting Concepts:
- Patterns - Earthworm behavior patterns emerge in response to environmental changes (moisture, light)
- Cause and Effect - Rain causes soil changes, which cause earthworms to move to the surface
- Systems and System Models - Earthworms are part of a soil ecosystem where decomposition supports other organisms

Science Vocabulary

* Segment: One of the ring-like sections that makes up an earthworm's body; segmentation allows the worm to bend and move.

* Decompose: To break down dead plants and animals into smaller pieces that return nutrients to soil.

* Habitat: The place where an animal or plant naturally lives and finds everything it needs to survive.

* Adaptation: A special body part or behavior that helps an organism survive in its environment.

* Organism: Any living thing, such as an animal, plant, or fungus.

* Nutrient: Substances in soil or food that help plants and animals grow and stay healthy.

External Resources

Children's Books:
- Wonderful Worms by Linda Glaser (simple, colorful introduction to earthworm biology and ecology)
- An Earthworm's Life by John Micklethwait (National Geographic Little Kids series; engaging photos and facts)
- Diary of a Worm by Doreen Cronin (engaging fictional narrative that builds interest and introduces worm characteristics)

YouTube Videos:
- "Earthworms: Nature's Recyclers" - National Geographic Kids (~5 minutes) Excellent overview of earthworm anatomy, behavior, and ecological importance with high-quality visuals. https://www.youtube.com/watch?v=cMPxUhBflEo
- "How Do Earthworms Move?" - Crash Course Kids (~4 minutes) Clear explanation of segmented body movement with animations suitable for fifth graders. https://www.youtube.com/watch?v=FaGLW9-tfaY

Teacher Note: This lesson leverages students' natural curiosity about the visible, living world around them. Earthworms provide a concrete entry point into abstract concepts like decomposition, ecosystems, and organism adaptation. Hands-on observation is essential for fifth-grade learners and creates memorable learning experiences that support long-term retention.