

Photo Description



This image shows an earthworm on moist soil and grass. You can see the earthworm's long, tube-shaped body divided into segments (ring-like sections) that help it move through the soil. The earthworm's brown color and smooth, moist skin help it survive in underground environments.

Scientific Phenomena

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

Earthworms live in soil where they tunnel through dirt to find food and create spaces for air and water. When heavy rain falls, water fills the soil spaces where earthworms breathe. The worms must come to the surface to find air and avoid drowning. This is a survival behavior—the earthworm is responding to changes in its environment to stay alive.

Core Science Concepts

- * Adaptation: Earthworms have physical features (segmented body, moist skin, small size) that help them live successfully in soil environments.
- * Habitat and Environmental Needs: Earthworms need moist soil with air, water, and organic matter to survive. They cannot live in dry conditions or fully underwater.
- * Decomposition and Nutrient Cycling: As earthworms tunnel and eat decomposing plant matter, they break it down and return nutrients to the soil, helping plants grow.
- * Life Cycles and Behavior: Earthworms have simple life stages (eggs, juveniles, adults) and respond to environmental changes like moisture and temperature.

Pedagogical Tip:

Use a "worm prediction chart" before observing live earthworms. Ask students: "What do you think will happen if we add water to the soil?" Then test predictions together. This activates prior knowledge and builds scientific reasoning skills before hands-on observation.

UDL Suggestions:

To support multiple learners:

- Representation: Provide labeled diagrams of earthworm anatomy alongside the live specimen or photo
- Action & Expression: Allow students to draw, write, or verbally describe the earthworm's features based on their observations
- Engagement: Connect earthworms to students' own experiences (gardening, rain, backyards) to build relevance and motivation

Discussion Questions

1. What do you observe about the earthworm's body, and how might its shape help it move through soil? (Bloom's: Analyze | DOK: 2)
2. Why do you think earthworms need moist soil? What might happen if the soil dried out completely? (Bloom's: Evaluate | DOK: 3)
3. How do earthworms help plants and gardens grow? (Bloom's: Understand | DOK: 2)
4. If an earthworm's habitat became flooded with water for weeks, predict what problems the earthworm might face. (Bloom's: Create | DOK: 3)

Extension Activities

1. Worm Observation Box (Wormery): Create a clear plastic container with alternating layers of soil and sand. Add earthworms and keep the soil moist. Over 2-4 weeks, students observe and sketch how worms tunnel, mix soil layers, and create burrows. This shows decomposition in action and worm behavior over time.
2. Soil Investigation: Have students collect soil samples from different locations (garden, playground, forest). Compare the number of earthworms and other organisms in each sample. Create a bar graph to show which habitats support the most earthworms and discuss why.
3. Decomposition Station: Layer earthworm habitat with food scraps (fruit peels, leaves, shredded paper). Predict what will happen to the scraps over two weeks. Observe and record changes, connecting this to how earthworms help break down waste and create healthy soil for plants.

NGSS Connections

Performance Expectation:

4-LS1-1: Construct an argument that plants get the materials they need for growth chiefly from air and water.

Disciplinary Core Ideas:

- 4-LS1.A (Structure and Function)
- 4-LS4.C (Adaptation)

Crosscutting Concepts:

- Structure and Function
- Cause and Effect

Science Vocabulary

- * Segmented: Divided into many connected sections or rings, like the rings you see on an earthworm's body.
- * Habitat: The natural home or environment where an animal or plant lives.
- * Adaptation: A feature or behavior that helps an animal or plant survive in its environment.
- * Decompose: To break down dead plants and animals into smaller pieces that become part of the soil.
- * Organisms: Living things, such as plants, animals, insects, and earthworms.

External Resources

Children's Books:

- Wonderful Worms by Linda Glaser (Interactive exploration of earthworm habitats and benefits)
- An Earthworm's Life by John Micklethwait (Simple life cycle and role in ecosystems)
- Compost Stew by Mary McKenna Siddals (Story connecting worms to decomposition and gardening)

YouTube Videos:

- "Life of an Earthworm" - National Geographic Kids (3:45 min) - Shows earthworm anatomy, burrowing, and environmental role. <https://www.youtube.com/watch?v=gBt8RNhMVvU>
- "Why Do Worms Come to the Surface When It Rains?" - TED-Ed (4:30 min) - Addresses the anchoring phenomenon with clear visuals and accessible explanations. <https://www.youtube.com/watch?v=2Z-MT-qWrLM>