

## Photo Description



This image shows an earthworm on moist soil and grass. The earthworm has a long, brown body made up of many ring-like segments. You can see the earthworm's smooth, wet skin that helps it move through soil and breathe.

## Scientific Phenomena

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

Earthworms live in soil and breathe through their moist skin. When soil becomes waterlogged after rain, oxygen levels drop in the underground spaces where earthworms live. Earthworms move to the surface where oxygen is more available. This behavior helps them survive, even though it exposes them to new dangers like birds and drying out. This is an example of how organisms respond to changes in their environment.

## Core Science Concepts

- \* Organism Adaptations: Earthworms have segmented bodies and moist skin that help them move through soil and absorb oxygen. Their body shape is perfectly designed for tunnel-making underground.
- \* Habitat and Environment: Earthworms need dark, moist soil with decomposing plants. They are sensitive to changes in moisture, temperature, and oxygen levels in their habitat.
- \* Life Cycles and Needs: Like all living things, earthworms need food (decaying plant matter), water, air, and shelter to survive. Understanding these needs helps us care for organisms.
- \* Decomposition and Soil Health: As earthworms tunnel and eat dead plants, they break down organic matter and create nutrient-rich soil. This process is essential for plant growth and the health of ecosystems.

### Pedagogical Tip:

When teaching about earthworms, avoid the common misconception that they are "cut in half and become two worms" if injured. Use this as a teachable moment: earthworms have specialized body segments with different functions. Damage to certain segments cannot be regenerated. This deepens students' understanding of body systems.

### UDL Suggestions:

To support diverse learners, provide multiple representations: use actual earthworms in a classroom observation bin (tactile), show labeled diagrams of earthworm anatomy (visual), read aloud descriptions of earthworm behavior (auditory), and allow students to draw or model earthworms with clay (kinesthetic). This multimodal approach ensures all learners can engage with the content.

### Discussion Questions

1. What do you think the earthworm needs to stay alive and healthy? (Bloom's: Remember | DOK: 1)
2. Why might an earthworm come up to the surface after it rains? What problem is it trying to solve? (Bloom's: Analyze | DOK: 2)
3. How do you think the earthworm's long, bendy body helps it survive in the soil? (Bloom's: Explain | DOK: 2)
4. If we removed all the earthworms from a garden, what might happen to the soil and plants over time? (Bloom's: Evaluate | DOK: 3)

### Extension Activities

1. Build an Earthworm Observation Bin: Gather a clear plastic container, layered soil and sand, dead leaves, and a few earthworms. Cover the container with dark paper (earthworms avoid light). Over 1-2 weeks, students observe and sketch the tunnels the earthworms create. Discuss how the worms' activity changes the soil structure. Always return worms to a suitable outdoor habitat afterward.
2. Earthworm Movement Investigation: Provide students with earthworms in shallow trays of moist soil. Ask: "How does the earthworm move? What parts of its body move first?" Students observe and record observations using drawings or words. Compare their findings to watch a slow-motion video of earthworm locomotion to deepen understanding.
3. Design a Worm Hotel: In small groups, students design and create a "worm habitat" using layers of soil, compost, shredded newspaper, and leaf litter in a see-through container. Students predict what will happen over two weeks, then observe decomposition and tunnel patterns. This connects to environmental stewardship and recycling concepts.

### NGSS Connections

Performance Expectation:

3-LS1-1: Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death.

Disciplinary Core Ideas:

- \* 3-LS1.B Growth and Development of Organisms
- \* 3-LS4.C Adaptation

Crosscutting Concepts:

- \* Structure and Function
- \* Cause and Effect

### Science Vocabulary

- \* Segment: One of the ring-like sections that make up an earthworm's body; each segment has muscles that help the worm move.
- \* Moist: Slightly wet; earthworms need moist skin to breathe and absorb oxygen.
- \* Decompose: To break down or rot; earthworms help decompose dead plants and leaves in the soil.
- \* Habitat: The place where an animal lives that has everything it needs to survive, like food, water, and shelter.

- \* Organism: A living thing, like a plant, animal, or insect.
- \* Adaptation: A special body part or behavior that helps an animal survive in its environment.

### External Resources

#### Children's Books:

- Diary of a Worm\* by Doreen Cronin (humorous introduction to worm life)
- The Life and Times of the Earthworm\* by Charles Micucci (detailed, kid-friendly illustrations)
- Worms for Dinner?\* by Patricia Lauber (introduces earthworms and food webs)

#### YouTube Videos:

- \* "Earthworms: Nature's Gardeners" – National Geographic Kids (3:45 min) – Explains why earthworms are important to soil health and ecosystems. <https://www.youtube.com/watch?v=9Ao5sZVnlcg>
- \* "How Do Earthworms Move?" – Crash Course Kids (4:12 min) – Demonstrates earthworm anatomy and locomotion with clear animations. <https://www.youtube.com/watch?v=2XoHLLQ4VGg>