

Photo Description



A deer is lying on its side on the ground, no longer alive. The deer's body appears peaceful and still on the dirt and grass. This shows us what happens to all living things as part of nature's cycle.

Scientific Phenomena

The anchoring phenomenon here is decomposition and the cycling of matter in ecosystems. When an organism dies, its body becomes a source of nutrients that will be broken down by decomposers like bacteria and fungi. This process returns important materials like carbon, nitrogen, and phosphorus back to the soil, where they can be used by plants to grow. This represents a critical part of how matter moves through ecosystems in continuous cycles, demonstrating that nothing in nature is truly "waste" - everything gets recycled.

Core Science Concepts

1. Life Cycles: All living things have a beginning, middle, and end to their lives, and death is a natural part of every organism's life cycle.
2. Decomposition Process: When organisms die, special living things called decomposers (bacteria, fungi, and some insects) break down the dead material into smaller pieces.
3. Matter Cycling: The materials that made up the deer's body will become nutrients in the soil that help plants grow, which then feed other animals.
4. Ecosystem Connections: Every living thing in an ecosystem depends on other living and non-living things, including the recycling of materials from dead organisms.

Pedagogical Tip:

When discussing death in nature with fourth graders, focus on the scientific process and emphasize how death contributes to new life. Use matter cycling as the central concept to keep discussions focused on observable, scientific phenomena rather than emotional aspects.

UDL Suggestions:

Provide multiple ways for students to represent their understanding of matter cycling - through drawings, physical models with clay or blocks, digital simulations, or acting out the process with movement. This supports different learning preferences and abilities.

Zoom In / Zoom Out

Zoom In: At the microscopic level, billions of tiny decomposer organisms (bacteria and fungi) are breaking apart the deer's cells and tissues, releasing molecules like carbon dioxide, water, and mineral nutrients that plants need to survive.

Zoom Out: This decomposition is part of the larger carbon and nitrogen cycles that connect all ecosystems on Earth. The carbon in this deer's body may eventually become part of a tree, then return to the atmosphere, then become part of another animal - demonstrating how matter continuously moves through Earth's systems.

Discussion Questions

1. What do you think will happen to this deer's body over the next few months? (Bloom's: Predict | DOK: 2)
2. How might the nutrients from this deer eventually help a plant grow? (Bloom's: Analyze | DOK: 3)
3. What would happen to an ecosystem if decomposers didn't exist? (Bloom's: Evaluate | DOK: 3)
4. How does this connect to what happens when you put food scraps in a compost bin? (Bloom's: Apply | DOK: 2)

Potential Student Misconceptions

1. Misconception: "Dead things just disappear or turn into dirt."
Reality: Dead organisms are broken down by living decomposers, and their materials become nutrients that cycle through the ecosystem.
2. Misconception: "Decomposition is dirty or bad for the environment."
Reality: Decomposition is essential for healthy ecosystems - without it, nutrients would be locked up and unavailable for new plant growth.
3. Misconception: "Only plants need nutrients from soil."
Reality: The nutrients released during decomposition support plant growth, which then provides food and energy for all other organisms in the food web.

Cross-Curricular Ideas

1. ELA - Writing & Storytelling: Have students write a fictional narrative following the journey of one nutrient atom from the deer's body through the soil, into a plant, and then into another animal. This combines creative writing with scientific understanding and helps students track matter movement through engaging storytelling.
2. Math - Data & Graphing: Students can research and create bar graphs or timelines showing how long decomposition takes for different organisms (insects vs. large animals vs. plants). This connects quantitative data skills with ecological understanding and allows students to practice graphing real scientific data.
3. Art - Nature Illustration & Cycles: Students create detailed drawings or digital illustrations of the decomposition cycle, depicting the deer, decomposers (bacteria, fungi, insects), plants growing from nutrient-rich soil, and herbivores eating those plants. This visual representation deepens understanding while developing artistic skills.
4. Social Studies - Land Management & Conservation: Discuss how park rangers, wildlife managers, and community members care for natural areas where animals live and die. Students can explore how understanding decomposition helps us appreciate and protect ecosystems in our own communities and around the world.

STEM Career Connection

1. Wildlife Biologist - Wildlife biologists study animals in their natural habitats to understand how they live, grow, and interact with their environments. They track populations, study food chains, and learn about decomposition and nutrient cycling to help protect animals and ecosystems. They might work in forests, parks, or zoos. Average Annual Salary: \$63,000
2. Soil Scientist (Pedologist) - Soil scientists study the composition and properties of soil, including how decomposed organisms become part of the soil that helps plants grow. They test soil quality, improve farming practices, and help restore damaged ecosystems by understanding nutrient cycling. Average Annual Salary: \$68,000
3. Environmental Scientist - Environmental scientists study how living and non-living things interact in ecosystems, including studying decomposition and matter cycling. They work to protect nature, clean up polluted areas, and help communities understand their impact on the environment. Average Annual Salary: \$71,000

NGSS Connections

Performance Expectation: 5-LS2-1 - Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.

Disciplinary Core Ideas:

- 5-LS2.B - Cycles of Matter and Energy Transfer in Ecosystems
- 5-PS1.A - Structure and Properties of Matter

Crosscutting Concepts:

- Systems and System Models
- Energy and Matter

Science Vocabulary

- * Decomposition: The process where dead plants and animals are broken down into smaller parts by bacteria and fungi.
- * Decomposer: A living thing like bacteria or fungi that breaks down dead organisms and returns nutrients to the soil.
- * Nutrient: A substance that living things need to grow and stay healthy.
- * Matter cycling: The way materials move from living things to the environment and back to living things again.
- * Ecosystem: All the living and non-living things in an area and how they interact with each other.

External Resources

Children's Books:

- "The Dead Bird" by Margaret Wise Brown
- "Lifetime: The Amazing Numbers in Animal Lives" by Lola M. Schaefer
- "A Seed Is Sleepy" by Dianna Hutts Aston