

Photo Description



This image shows a large, hollow tree log lying on the ground in a forest. The wood is rotting and breaking down, with parts that are crumbly and dark inside. You can see fresh, light-colored wood where it has been cut, and plants and other trees growing around it.

Scientific Phenomena

Anchoring Phenomenon: Decomposition and Nutrient Cycling in Forest Ecosystems

This log is decomposing—breaking down into smaller and smaller pieces. When trees fall, they don't just disappear. Instead, tiny living things called decomposers (bacteria, fungi, and insects) eat the dead wood, breaking it apart. As the wood breaks down, it returns nutrients to the soil. This "nurse log" then becomes a home and food source for new plants, insects, and other forest creatures. This is nature's recycling system—nothing goes to waste in a forest!

Core Science Concepts

1. Decomposition: Dead organisms break down into simpler materials that enrich the soil and help new life grow.
2. Habitat and Shelter: Fallen logs provide homes for insects, small animals, fungi, and other organisms that live in and around the decaying wood.
3. Nutrient Cycling: As the log rots, nutrients return to the soil, which feeds new plants and completes the life cycle.
4. Living vs. Nonliving Things: Students observe that while the log is no longer a living tree, it supports many living things (insects, fungi, plants) that depend on it.

Pedagogical Tip:

Use a sensory-rich approach: Bring a small piece of rotting wood to class (if safely obtained) so students can feel the crumbly texture, observe the color changes, and perhaps spot small insects. This hands-on experience makes the abstract concept of decomposition concrete and memorable for 5-6-year-olds.

UDL Suggestions:

UDL Checkpoint 2.4 (Maximize effort and persistence): Provide multiple ways to explore the concept: hands-on observation of wood samples, photographs, diagrams, and a video clip of time-lapse decomposition. Some students may excel with tactile exploration, while others benefit from visual or auditory explanations. Offer both individual and small-group investigations to support different learning preferences.

Zoom In / Zoom Out

Zoom In: Microscopic Level

At a microscopic level, bacteria and fungi are doing the real work of decomposition. These tiny organisms (too small to see without a microscope) break down the wood fibers into even smaller pieces. Insects like termites and beetles also tunnel through and chew the wood, creating pathways for fungi to grow deeper inside. These decomposers release chemicals that soften the hard wood, making it crumbly and easy to break apart.

Zoom Out: Forest Ecosystem

When you zoom out, this single nurse log is just one small part of a vast forest system. Fallen logs feed the entire forest floor, enriching the soil for thousands of plants. They create highways and homes for countless creatures—from microscopic organisms to deer and bears. The nutrients released from the log feed trees, shrubs, and wildflowers. In turn, these plants provide food and shelter for animals. The nurse log connects all living things in the forest together in a web of life.

Discussion Questions

1. "What do you think is happening inside this log? Why might it look different from the outside than the inside?"
- Bloom's: Analyze | DOK: 2
2. "What kinds of animals or bugs do you think might live in or eat this fallen log?"
- Bloom's: Create | DOK: 2
3. "How do you think this log helps new plants grow in the forest?"
- Bloom's: Evaluate | DOK: 3
4. "If we took this log away, what might happen to the forest creatures and plants that depend on it?"
- Bloom's: Analyze | DOK: 3

Potential Student Misconceptions

1. Misconception: "The log is dead, so nothing lives in it anymore."
- Clarification: The log's wood is no longer alive, but it becomes a home and food source for millions of living things! Insects, fungi, and plants all depend on the fallen log. It's full of life, just in a different way.
2. Misconception: "Decomposition is the same as garbage rotting in the trash."
- Clarification: Decomposition in nature is healthy and helpful—it recycles nutrients and feeds new plants. Trash in a landfill doesn't always break down this way because it's often in sealed containers without the right conditions, and some materials don't decompose naturally.
3. Misconception: "Once a tree falls, it's the end of its story."
- Clarification: A fallen tree is actually the beginning of a new chapter! It becomes a nurse log, feeding and sheltering new plants and animals for many years.

Extension Activities

1. Decomposition in a Jar:

Create a simple observation jar with layers of soil, sand, and small pieces of dead leaves or paper towels. Add a little water and seal it. Over weeks, students observe how the organic material breaks down. This brings the forest decomposition process into the classroom in a contained, safe way.

2. Build a Log Habitat:

Provide a plastic tub filled with soil and a small piece of bark or wood. Let students add leaves, twigs, and a spray of water to create a mini-ecosystem. Place the tub in a quiet spot and observe over several weeks for insects and fungi that colonize the wood. (Ensure students wash hands after touching the soil/wood.)

3. Forest Floor Sensory Walk:

Take students on a nature walk to a safe area where fallen logs or branches are visible (with proper supervision and on school grounds). Let them observe, sketch, and feel different stages of wood decay. Ask them to find insects or fungi living on fallen wood and discuss what they observe.

Cross-Curricular Ideas

1. ELA - Storytelling & Sequencing:

Have students create a simple story or sequence of pictures showing the life of a tree: sprouting, growing tall, falling down, and becoming a nurse log. Use words like "first," "next," and "last" to reinforce sequence vocabulary.

2. Math - Measurement & Growth:

Measure the width and length of the log in the photo. Plant seeds in a cup of soil and measure seedling growth over weeks. Compare growth rates and discuss how a nurse log provides nutrients for faster plant growth.

3. Art - Nature Collage:

Collect leaves, twigs, bark pieces, and other forest materials. Create a mixed-media collage showing a forest floor and decomposing log. Discuss colors, textures, and patterns found in decomposing wood.

4. Social Studies - Caring for Nature:

Discuss how we can help forests by leaving fallen logs in place rather than removing them. Connect to community stewardship and why protecting forests matters for all living things.

STEM Career Connection

1. Forest Ecologist:

Forest ecologists study how forests work, including how fallen trees help new plants grow and how animals live in the forest. They protect forests and help us understand nature.

- Average Annual Salary: \$65,000 USD

2. Mycologist (Fungus Scientist):

Mycologists study fungi and mushrooms that grow on logs and in forests. They learn how these tiny living things help break down dead wood and recycle nutrients back into the soil.

- Average Annual Salary: \$58,000 USD

3. Park Ranger or Environmental Educator:

Park rangers teach people about forests and nature, including why we should leave fallen logs in place. They protect forest habitats and help visitors understand how ecosystems work.

- Average Annual Salary: \$48,000 USD

NGSS Connections

Performance Expectation:

- K-LS1-1: Use observations to describe patterns of what plants and animals (including humans) need to survive.

Disciplinary Core Ideas:

- K-LS1.A (Structure and Function): Students observe that living things need food, water, and shelter—and that a nurse log provides all three for forest creatures.
- K-ESS3.A (Natural Resources): Students learn that natural materials (like fallen wood) are resources used by living things.

Crosscutting Concepts:

- Systems and System Models: A fallen log is part of a larger forest system where energy and matter cycle.
- Patterns: Decomposition follows patterns—logs always break down, supporting new growth in predictable ways.

Science Vocabulary

- * Decompose: When something dead breaks down into smaller and smaller pieces over time.
- * Nutrients: Special food that plants and animals need to grow strong and healthy.
- * Habitat: A place where plants and animals live and find food and shelter.
- * Rotting: The process where dead things slowly break apart and turn into soil.
- * Nurse Log: A fallen tree that becomes home and food for new plants and animals in the forest.
- * Fungi: Tiny living things (like mushrooms and mold) that help break down dead wood.

External Resources

Children's Books:

- The Busy Tree by Jennifer Ward (explores a tree's role in an ecosystem)
- Who Lives Here? Forest Animals by Fay Robinson (introduces forest habitats and creatures)
- In the Woods: Who's Been Here? by Lindsay Barrett George (detective-style book about forest wildlife and signs of life)