

## Photo Description



Small brown mushrooms are growing on wood chips on the ground. The mushrooms have round tops and thin stems. They look like tiny umbrellas popping up from the wood pieces.

## Scientific Phenomena

The anchoring phenomenon shown here is fungal decomposition and growth. These mushrooms are the visible fruiting bodies of fungi that are breaking down dead organic matter (wood chips) in the soil. The fungi are acting as nature's recyclers, using enzymes to decompose the wood cellulose and lignin, converting complex organic compounds into simpler nutrients that can be absorbed by plants. The mushroom structures we see are reproductive organs that release spores to create new fungi, while the main fungal body (mycelium) remains hidden underground, continuing the decomposition process.

## Core Science Concepts

1. Living vs. Non-living Classification: Mushrooms are living things that grow and change, even though they don't move around like animals or make their own food like plants.
2. Life Cycles and Growth: Fungi start as tiny spores, grow underground networks, and then produce mushrooms that make more spores to continue the cycle.
3. Decomposition and Recycling: Mushrooms help break down dead plant materials like wood chips, turning them into nutrients that help other plants grow.
4. Habitat and Basic Needs: Fungi need moisture, darkness, and dead organic matter to survive and grow.

### Pedagogical Tip:

Use real mushrooms or fungi specimens in clear containers for students to observe with magnifying glasses. This hands-on exploration helps first graders make concrete observations before moving to abstract concepts about decomposition.

### UDL Suggestions:

Provide multiple ways for students to express their observations: drawing pictures, using body movements to show how mushrooms grow, or using manipulatives to sequence the fungal life cycle. This supports different learning styles and abilities.

### Zoom In / Zoom Out

1. Zoom In: Underneath the ground, tiny thread-like structures called hyphae spread through the soil like an invisible web, breaking down dead materials molecule by molecule and absorbing nutrients.
2. Zoom Out: These decomposing fungi are essential parts of forest and garden ecosystems, recycling nutrients that feed trees, flowers, and other plants, which then provide food and oxygen for animals and humans.

### Discussion Questions

1. What do you notice about where these mushrooms are growing? (Bloom's: Observe | DOK: 1)
2. How do you think these mushrooms help the wood chips change over time? (Bloom's: Analyze | DOK: 2)
3. What might happen to a forest if there were no mushrooms or fungi to break down dead leaves and wood? (Bloom's: Evaluate | DOK: 3)
4. How are mushrooms different from the plants in our classroom garden? (Bloom's: Compare | DOK: 2)

### Potential Student Misconceptions

1. Misconception: "Mushrooms are plants because they grow from the ground."  
Clarification: Mushrooms are fungi, which are different from plants. Unlike plants, they cannot make their own food from sunlight and must get nutrients by breaking down other materials.
2. Misconception: "All mushrooms are bad or poisonous."  
Clarification: Many mushrooms are helpful decomposers that clean up nature, and some are safe to eat, though children should never touch or eat wild mushrooms without adult supervision.
3. Misconception: "Mushrooms appear instantly overnight."  
Clarification: Mushrooms grow from underground networks that have been developing for days or weeks; we just notice them when they finally pop up above ground.

### Cross-Curricular Ideas

1. Math - Counting and Patterns: Have students count the mushrooms in the photo and create simple patterns with mushroom cutouts (small, large, small, large). They can also measure mushroom heights using non-standard units like paper clips or blocks.
2. ELA - Sequencing and Storytelling: Students can draw and sequence pictures showing the life cycle of a mushroom: spore → underground growth → mushroom appears. They can then dictate or write simple sentences about each stage using words like "first," "next," and "last."
3. Art - Nature Collage and Texture Exploration: Provide students with real wood chips, bark, and other natural materials to create textured collages showing mushrooms and their habitats. This helps them understand the decomposer's environment while developing fine motor skills.
4. Social Studies - Community Helpers in Nature: Connect fungi to people who help keep communities clean (sanitation workers, gardeners, park rangers). Discuss how mushrooms are like "nature's helpers" that clean up and recycle waste, just as community workers help keep our neighborhoods healthy.

## STEM Career Connection

1. Mycologist - A scientist who studies mushrooms and fungi! Mycologists learn about different types of fungi, where they grow, and how they help nature. Some mycologists even discover new mushroom species. They work in laboratories, forests, and universities. Average Annual Salary: \$45,000 - \$65,000
2. Forest Ranger or Naturalist - These outdoor workers take care of forests and teach people about nature. They observe mushrooms and other decomposers to keep forests healthy and balanced. Forest rangers help protect habitats where fungi and other organisms live. Average Annual Salary: \$40,000 - \$55,000
3. Soil Scientist - A scientist who studies soil and what makes it healthy and rich for growing plants. Soil scientists learn how fungi and decomposers break down dead materials and create nutrients in the soil. This helps farmers and gardeners grow better plants and food. Average Annual Salary: \$50,000 - \$70,000

## NGSS Connections

- Performance Expectation: 1-LS1-1 - Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs.
- Disciplinary Core Idea: 1-LS1.A - All organisms have external parts that they use to perform daily functions.
- Crosscutting Concept: Structure and Function - The shape and stability of structures of natural objects are related to their function.

## Science Vocabulary

- \* Fungi: Living things like mushrooms that break down dead plants and animals to get food.
- \* Decompose: To break down dead things into smaller pieces that become part of the soil.
- \* Spores: Tiny seeds that fungi use to make new mushrooms.
- \* Nutrients: Food that plants and animals need to grow and stay healthy.
- \* Habitat: The place where a living thing finds everything it needs to survive.

## External Resources

### Children's Books:

- The Magic School Bus Meets the Rot Squad by Joanna Cole
- Mushroom in the Rain by Mirra Ginsburg
- National Geographic Readers: Mushrooms by Kristin Baird Rattini