

## Photo Description



This image shows a cluster of small, delicate mushrooms with pale gray, cone-shaped caps arranged on a bed of dark wood chips and decaying wood. The mushrooms have thin, fragile-looking stems and deeply ridged caps that look like tiny umbrellas. These fungi are growing in a wood chip mulch environment, where they break down dead plant material.

## Scientific Phenomena

**Anchoring Phenomenon:** Why do mushrooms suddenly appear in mulch, wood chips, or lawns?

**Why This Happens:**

Mushrooms are the "fruiting bodies" of fungi—similar to how apples are the fruit of an apple tree. The fungus itself lives hidden in the soil or wood as thread-like filaments called mycelium. When conditions are right (moisture, warmth, and decomposing organic matter), the fungus produces mushrooms to release spores into the air. These spores are like "seeds" that spread fungi to new locations. The mushrooms in this image are growing on wood chips because the fungus is feeding on and breaking down the dead wood—a process called decomposition that is essential for recycling nutrients in ecosystems.

## Core Science Concepts

1. **Fungi as Decomposers:** Fungi break down dead plants and animals, returning nutrients to the soil so new plants can grow. They are nature's recyclers.
2. **Life Cycles of Organisms:** Fungi have a life cycle that includes a hidden growing stage (mycelium) and a visible fruiting stage (mushrooms). Different organisms have different life cycles.
3. **Structures and Functions:** Mushroom caps have gills or pores underneath that produce and release millions of microscopic spores. The stem supports the cap and lifts it into the air so spores can spread easily.
4. **Ecosystem Roles:** Decomposers like fungi play a critical role in food webs and nutrient cycles—without them, dead material would pile up and new life couldn't grow.

### Pedagogical Tip:

Many students think fungi are plants because they grow from the ground. Explicitly teach that fungi are their own kingdom—neither plants nor animals. Use the analogy: "Plants make their own food from sunlight (like a solar panel), animals eat other organisms, but fungi release chemicals to break down food outside their body first, then absorb it." This conceptual distinction is crucial for understanding biological diversity.

### UDL Suggestions:

**Multiple Means of Representation:** Provide labeled diagrams showing the hidden mycelium underground alongside the visible mushroom fruiting body. Some students benefit from seeing both parts simultaneously. **Multiple Means of Expression:** Allow students to create their own life cycle illustrations, written descriptions, or physical models (clay mushrooms) rather than only drawing. **Multiple Means of Engagement:** Connect fungi to student interests—pizza sauce (made with tomatoes), bread (yeast is a fungus), or forest exploration—to increase relevance.

### Discussion Questions

1. Where do you think the "mother" fungus is hiding, and how does it create these mushrooms? (Bloom's: Understand | DOK: 2)
2. If mushrooms release spores into the air, how might fungi spread to different places in your neighborhood or town? (Bloom's: Analyze | DOK: 2)
3. What might happen to dead leaves and fallen branches in a forest if there were no fungi to break them down? (Bloom's: Evaluate | DOK: 3)
4. These mushrooms are growing in wood chips. What is the fungus actually "eating," and how does that help the soil? (Bloom's: Apply | DOK: 2)

### Extension Activities

1. Observe Fungi in Your School Yard: Take students on a nature walk to search for mushrooms, shelf fungi, or mold on dead logs. Photograph findings and create a classroom "fungi field guide." Have students measure, sketch, and record where fungi were found. Safety note: Do NOT allow students to touch or collect wild mushrooms; observation only.
2. Decomposition Observation Jar: Layer soil, dead leaves, and bark chips in a clear jar with a small amount of water. Seal it loosely and observe over 4–6 weeks. Have students predict what will happen and record changes with drawings. Discuss: "Where do you see evidence that fungi might be breaking down the dead material?"
3. Spore Printing Activity: Bring in store-bought mushrooms (edible button mushrooms are safe). Place the cap gill-side down on dark paper overnight. The spore print appears the next day. Have students observe and count the ridges on the mushroom cap, discussing how such tiny structures can release thousands of spores.

### NGSS Connections

Performance Expectation:

5-LS1-1: Support an argument that plants get the materials they need for growth chiefly from air and water. (Implicit connection: Fungi obtain materials differently—through decomposition)

Disciplinary Core Ideas:

- 5-LS1.C: Organization for Matter and Energy Flow in Organisms
- 5-LS2.B: Cycles of Matter and Energy Transfer in Ecosystems

Crosscutting Concepts:

- Systems and System Models
- Energy and Matter
- Stability and Change

### Science Vocabulary

- \* Fungi: Living organisms (like mushrooms and mold) that break down dead plants and animals to get food.
- \* Mycelium: The hidden, thread-like part of a fungus that lives in soil or wood and breaks down organic material.
- \* Decomposer: An organism that breaks down dead plants and animals and returns nutrients to the soil.
- \* Spores: Tiny, seed-like structures that fungi release into the air to make new fungi in other places.

\* Fruiting Body: The visible part of a fungus that produces and spreads spores (like a mushroom).

\* Ecosystem: All the living and nonliving things in an area and how they interact with each other.

### External Resources

Children's Books:

- National Geographic Little Kids First Big Book of Bugs by Kathryn Baicker (includes fungi basics)
- The Fungus Among Us: Exploring Molds and Mushrooms by Adrienne Mason (engaging exploration of decomposers)
- Decomposers by Vijaya Khisty Bodach (part of the Food Chain series, direct and age-appropriate)

YouTube Videos:

- "What Are Fungi? | BBC Learning" – Clear, visually engaging overview of fungal life cycles (<https://www.youtube.com/watch?v=oHf1vD5nLEw>) ~4 minutes
- "The Incredible Journey of a Mushroom" by TED-Ed – Explains how mushrooms form and spread spores with animated illustrations (<https://www.youtube.com/watch?v=XotBPbkLs2w>) ~5 minutes

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Final Note: This lesson transforms a simple observation into deep learning about decomposition, life cycles, and ecosystem roles. Encourage curiosity about fungi without fear—these organisms are essential partners in our natural world!