

## Photo Description

This image shows an unusual orange and brown mushroom growing from wood chips on the ground. The mushroom has a bright orange base that looks like it's melting or oozing, with dark brown finger-like parts sticking up from the top. This strange-looking fungus is called a stinkhorn mushroom, and it gets its name because it smells bad to attract flies.



## Scientific Phenomena

The anchoring phenomenon here is fungal reproduction and spore dispersal. This stinkhorn mushroom has developed a fascinating strategy to spread its offspring - it produces a foul-smelling, sticky substance called gleba that contains millions of spores. The terrible odor (like rotting meat) attracts flies and other insects, who land on the mushroom thinking they've found food. As they walk around and feed, the spores stick to their bodies, and when the insects fly away, they carry the spores to new locations where they can grow into new mushrooms. This is the mushroom's clever way of "hitchhiking" to reproduce without being able to move on its own.

## Core Science Concepts

1. Decomposer Role in Ecosystems: Fungi like this stinkhorn break down dead organic matter (wood chips, fallen leaves) and return nutrients to the soil, playing a crucial role in nutrient cycling.
2. Adaptation for Survival: The stinkhorn's orange color, strong odor, and sticky spore mass are all adaptations that help it successfully reproduce by attracting the right insects for spore dispersal.
3. Life Cycles: This mushroom represents just one stage in the fungal life cycle - the reproductive stage where spores are produced and released to create new organisms.
4. Symbiotic Relationships: The relationship between the stinkhorn and insects demonstrates mutualism - the mushroom gets spore dispersal while insects get a food source.

### Pedagogical Tip:

Have students use their senses (except taste!) to make observations. The contrast between this mushroom's appearance and typical mushrooms will spark curiosity and help students understand that organisms have different strategies for survival.

### UDL Suggestions:

Provide multiple ways for students to document observations - drawing, photography, verbal descriptions, or graphic organizers. Some students may be sensitive to discussing "bad smells," so offer alternative ways to describe the mushroom's odor like "strong scent" or "insect-attracting smell."

### Zoom In / Zoom Out

1. Zoom In: At the microscopic level, millions of tiny spores (like fungal seeds) are embedded in the slimy, smelly coating. These spores are so small they can only be seen with a microscope, and each one has the potential to grow into a new fungus if it lands in the right conditions.
2. Zoom Out: This decomposer is part of a larger forest ecosystem where fungi, bacteria, insects, plants, and animals all depend on each other. The nutrients this mushroom releases by breaking down wood chips will eventually be absorbed by plant roots, supporting the entire food web in the area.

### Discussion Questions

1. "What evidence do you see that this organism is adapted for a specific purpose?" (Bloom's: Analyze | DOK: 3)
2. "How might removing all the decomposers from a forest affect the other living things there?" (Bloom's: Evaluate | DOK: 3)
3. "What other examples can you think of where organisms use smells to communicate or attract other living things?" (Bloom's: Apply | DOK: 2)
4. "If you were designing an organism to spread its offspring without being able to move, what features would you give it?" (Bloom's: Create | DOK: 4)

### Potential Student Misconceptions

1. Misconception: "All mushrooms are plants because they grow from the ground."  
Clarification: Mushrooms are fungi, which are neither plants nor animals. They cannot make their own food through photosynthesis like plants do, and instead must get nutrients by breaking down dead materials.
2. Misconception: "This mushroom is trying to hurt insects by tricking them."  
Clarification: The mushroom isn't "tricking" anyone - this is a natural partnership where both the fungus and insects benefit. The insects get food, and the mushroom gets its spores spread around.
3. Misconception: "The bad smell means the mushroom is sick or dying."  
Clarification: The strong odor is completely normal and healthy for this type of mushroom - it's their natural way of attracting insects for reproduction.

### Cross-Curricular Ideas

1. ELA - Descriptive Writing: Have students write a detailed description of the stinkhorn mushroom using sensory words (without tasting it!). They can practice adjectives like "slimy," "bright," "tall," and "bumpy" to help readers visualize the organism. Students could even write from the perspective of an insect discovering the mushroom!
2. Math - Measurement & Data: Students can measure the height and width of mushrooms they find in their schoolyard or local park, then create a chart or graph showing the sizes of different fungi. They can also estimate how many spores might be on a mushroom based on its surface area, practicing multiplication and estimation skills.
3. Art - Nature Observation Drawing: Have students create detailed sketches or paintings of the stinkhorn mushroom, focusing on its unique orange and brown coloring. They can also design their own imaginary fungi with different colors and shapes, thinking about what features would help their invented organism survive and reproduce.

4. Social Studies - Local Ecosystems & Community Science: Connect this to students' local environment by having them research what decomposers live in their area and how they help keep ecosystems healthy. Students could participate in citizen science projects that document fungi in their community or create a guide to local mushrooms and fungi for their school.

### STEM Career Connection

1. Mycologist (Fungal Scientist): A mycologist is a scientist who studies fungi like mushrooms, molds, and yeasts. They might research how fungi help forests stay healthy, discover new species of mushrooms, or figure out ways to use fungi to help people (like making medicine). Mycologists work in laboratories, universities, and nature centers. Average Annual Salary: \$65,000 - \$75,000 USD

2. Forest Ecologist: Forest ecologists study how all the living things in a forest work together, including plants, animals, insects, and decomposers like fungi. They help protect forests and understand how ecosystems stay balanced. These scientists might work for the government, universities, or conservation organizations to keep forests healthy. Average Annual Salary: \$58,000 - \$70,000 USD

3. Environmental Educator or Nature Center Director: These professionals teach children and families about nature, ecosystems, and organisms like fungi. They might lead nature walks, create museum exhibits, or design educational programs about decomposers and their importance. They help people understand and care for the natural world. Average Annual Salary: \$40,000 - \$55,000 USD

### 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.A - The food of almost any kind of animal can be traced back to plants; 5-LS2.B - Matter cycles between the air and soil and among plants, animals, and microbes
- Crosscutting Concepts: Systems and System Models - A system can be described in terms of its components and their interactions; Patterns - Similarities and differences in patterns can be used to sort and classify natural phenomena

### Science Vocabulary

- \* Decomposer: An organism that breaks down dead plants and animals and returns nutrients to the soil.
- \* Spore: A tiny reproductive cell that can grow into a new organism under the right conditions.
- \* Adaptation: A special feature that helps an organism survive and reproduce in its environment.
- \* Fungus: A living thing that is neither a plant nor an animal and gets nutrients by breaking down dead materials.
- \* Dispersal: The process of spreading seeds or spores to new locations where they can grow.
- \* Mutualism: A relationship between two different organisms where both benefit from living or working together.

### External Resources

#### Children's Books:

- The Magic School Bus Meets the Rot Squad by Joanna Cole
- Fungus Is Among Us! by Ryan Jacobson
- National Geographic Readers: Fungi by Libby Romero