



## WINTER ACTIVITIES

# A Fungus Among Us: Exploring Mushrooms



## OVERVIEW

Mushrooms are strange creatures, neither plant nor animal, yet with characteristics of each. In this exploration, children will discover the parts of mushrooms through observation and dissection. By listening to a book about mushrooms, children learn about how mushrooms grow and reproduce. To wrap up the activity, the class will make a spore print from a large portobello mushroom.

## OBJECTIVES

After this experience, children will be able to:

- identify the stalk, cap, gills, rings, spores and underground threads (hyphae) of a mushroom. • describe how mushrooms grow.
- describe the conditions that mushrooms need for growth.
- explain the differences between a young and a mature mushroom.
- explain the differences between plants and mushrooms in a simple way: “Plants need sun to grow; mushrooms don’t. Plants make seeds from pollinated flowers; mushrooms make spores in their gills and make new mushrooms when the underground threads touch each other.”

## ESSENTIAL QUESTIONS

- What is a mushroom? How are mushrooms similar to plants? How are they different? • What are the parts of a mushroom?
- How do mushrooms grow?



## WINTER ACTIVITIES

### BACKGROUND

Mushrooms are nutritious and low in calories. They contain B vitamins and have a high protein content. They are strange, interesting organisms and children are fascinated by their structure and functions in the world.

Mushrooms are neither plant nor animal. They are fungi. They do not contain chlorophyll and do not use sunlight for growth. The body of a mushroom is called mycelium and it is an underground network of threads (hyphae) that connect with trees and plants around them, sharing nutrients in a symbiotic relationship. Mushrooms get their nutrients by metabolizing dead organic matter, similar to the decomposition process in a compost pile.

Wild mushrooms have a yearly growing cycle. Commercial mushrooms can be grown in farms all year with warm, damp conditions. The parts of the mushroom are the cap, the stalk, the threads, the gills and the spores. Spores grow on the gills and fall off when they are mature. Then they are blown by wind to a new location. When conditions are right, threads grow out of the spores. They make a web of white, cottony fibers underground. When threads connect to each other, a mushroom starts to grow and pushes up through the soil. The cap, which starts as a closed, button shape, breaks away from the stalk and opens to a flat shape. The spores begin to grow in the gills, and the cycle starts again.

The underground networks formed by mycelia attach to the roots of plants and have a symbiotic relationship with them. By attaching their mycelia to existing plant root systems, mycorrhizal fungi form huge underground neural networks that help themselves and other plants survive, fight disease and transfer nutrients among interconnected plants. The fungi share nutrients with the roots of plants, and plants provide photosynthesized nutrients (carbohydrates) to the fungi.

For more information on neural networks and the fascinating symbiotic relationships of Kingdom Fungi with Kingdom Plantae, refer to the *Resources* at the end of this lesson.



## WINTER ACTIVITIES

### MATERIALS

- Book: *Mushrooms* by Barrie Watts (this is only available in libraries, pub. 1986)
- Other book alternatives: *We Are Fungi* by Christine Nishiyama or *The Mushroom Fan Club* by Elise Gravel
- Small mushrooms (white cap/button mushrooms)
- Large portobello mushrooms
- Blank white paper
- Tray
- Bowl
- Water
- Knife
- Magnifying glasses
- Newspaper or butcher paper to cover the table (optional)

### PREPARATION

- Buy or borrow the book(s) for this activity.
- Buy white button mushrooms and large portobello mushrooms a day or two before the activity.
- Gather materials and set them up.
- Cut small button mushrooms in half to expose a cross section.

### PROCEDURE: FACILITATOR'S ROLE

- Read the recommended book(s). Pause to emphasize the differences between mushrooms and

plants:

- threads or roots
- spores or seeds
- grows in darkness or sunlight
- Guide discussion and questions during the book.
- Slice the small mushrooms down the middle to expose a cross-section and give a piece to each child.
- Ask leading questions to facilitate discussion about what the children observe. Help them identify the various parts of the mushroom.

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## WINTER ACTIVITIES

- After the children finish dissecting and examining the mushrooms, take the large portobello mushroom and carefully peel back the skin from the edges to expose the gills. Remove the stalk so that the cap can lie flat on a piece of paper.
- Explain that we will be making a spore print and ask what the children think a spore print might be. Explain that the mushroom will sit still for a week. During this time the mushroom will shrivel and decompose slightly, and the gills will release the spores onto the paper.
- Place a piece of paper on a tray and place the portobello mushroom, gills down, onto the paper. • Dampen the top of the mushroom slightly, then cover with a bowl and set aside for one week.
- After a week, carefully lift the portobello mushroom off the paper to retain as many undisturbed pores as possible.
- Facilitate observation and discussion about the spore print.
- Laminate the spore print and hang in the classroom or home.

### PROCEDURE: CHILD'S ROLE

- Listen to the book, ask questions and make comments or observations. Discuss how mushrooms are different from plants.
- Observe the mushroom halves with magnifying glasses, identifying the stalk, ring, cap and gills. • Pull out the stalk, examine the gills, and taste the parts if desired.
- Feel the mushrooms and describe how they feel. Do different parts feel different from each other? • How does the mushroom taste? Do different parts taste different from each other? • Compare the mature portobello gills and cap to the younger mushroom.
- Using an intact, untouched mature portobello mushroom cap, place the cap carefully onto a blank

paper which is sitting on a tray or other hard flat surface. For younger children, the teacher may need to do this step.

- Revisit the mushroom in a week to see if the spores printed successfully. Observe the print to see the spores and outline of the gills and stalk.

## ADAPTATIONS FOR AGE AND ABILITY

Older children may be able to do the steps of the spore print without an adult's help. Making drawings of mushroom parts and labeling the parts may help students retain the information.

## FOLLOW UP

Food projects with mushrooms, such as a mushroom, onion and green pepper pizza, or a mushroom omelet, may encourage children to eat mushrooms while they are excited about them.

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## WINTER ACTIVITIES

Another follow up to this activity could be a mushroom hunt in the spring or fall, or whenever mushrooms start to appear in your location. It's important to let the children know that mushrooms in the wild are not to be touched or eaten without expert supervision, since it is difficult to tell which are edible and which are poisonous.

## RESOURCES

### Books

*We Are Fungi* by Christine Nishiyama

*The Mushroom Fan Club* by Elise Gravel

*Mushrooms* by Barrie Watts (this is only available in libraries (pub. 1986)

### Online (for adults)

[Are Mushrooms Intelligent?](#)

[Paul Stamets' TED talk: Six Ways Mushrooms Can Save The World](#)

[Book: Mycelium Running: How Mushrooms Can Help Save the World by Paul Stamets](#)

