

Fungus Among Us

Overview: Often overlooked and under-appreciated, fungi are an important part of our environment. In this lesson, students will take a closer look at this vital garden resident.

Grade Level/Range: K–2nd Grade

Objective: Students will:

- discover fungi are alive
- learn about the important role fungi plays in the environment
- search for fungi in gardens and green spaces

Time: 1 hour

Materials:

- Clipboard or other hard surface to write on
 - Paper
 - Pencil
 - Index cards
 - Dry erase board, chalkboard or chart paper
 - A mushroom field guide (there are many available, such as the USDA's *Field Guide to Common Macrofungi in Eastern Forests* (https://www.fs.fed.us/nrs/pubs/gtr/gtr_nrs79.pdf)
- OR
- An identification app (like Seek by iNaturalist)



Background Information

Beyond plants and animals, there is another major category of living organisms in your garden — fungi! There are many types and species of fungi, and they include a wide range of organisms. Some are too small to see without a microscope, such as the mycorrhizae that connect your plant roots below the ground (read more at *Mycorrhizae and Plants*, <https://kidsgardening.org/garden-how-to-mycorrhizae/>). Others are easier to see, like the mushrooms found in a diversity of sizes, shapes, and colors that seem to spring up overnight around your garden.

Unlike plants that make their own food through photosynthesis, fungi rely on forming *parasitic* (negatively impacting host organisms) or *symbiotic* (beneficial to other organisms) relationships with other organisms to meet their energy needs. Many fungi, including most mushrooms, are important decomposers. Not only do they gain energy from dead plant matter for their own nutrition, in the process they also release nutrients back into the soil to benefit all the plants around them. Mushrooms are one of the most widely recognized fungi in a garden setting.

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Note on pronunciation: The word fungi can be pronounced in various ways. Some people say "FUN-guy" (hard g); some say "FUN-ji" (soft g as in giant, long i as in tie). And some say "FUN-gee" pronounced with either a soft or hard g.

Laying the Groundwork

Venture out to your schoolyard or garden and ask students to create an inventory list of all the different kinds of objects they see (plants, rocks, trees, playground equipment, water, clouds, grass, sun, etc.). If students do not discover any on their own, make sure to look for and point out any mushrooms/fungi present. You are very likely to find mushrooms in areas where wood is decomposing. Check out fallen trees, older wooden raised beds, areas where trees have been removed, and paths or garden beds with recently applied mulch.

When you get back to the classroom, ask them to share their lists and make an index card for each item listed.

Exploration

1. Read a book about living and nonliving things such as *Is It a Living Thing?* by Bobbie Kalman. Make a list of all the characteristics of living things on a dry erase board or chart paper, including:
 - Living things grow and change
 - Living things reproduce
 - Living things take in energy, air, water, nutrients and food
2. Next, create two lists on your board or chart paper – one that says “Living” and one that says “Non-Living.” One at a time, sort the index cards you made into these two categories. As items are placed into the “Living” category, go through your list of characteristics of living things as evidence that they belong in that category. Save your fungi examples for last.
3. Hopefully (and most likely) you discovered at least one example of fungi. Use the characteristics of living things list to discuss. If students are not sure whether fungi is living or non-living, use additional observation or conduct research together to find the answer.
4. Learn more about fungi and all the important things it does in our environment. Here are some interesting facts you may want to share:
 - Fungi live all over the world in all kinds of environments. Scientists have even found fungi in Arctic regions.
 - Fungi cannot make its own food so it must get its energy from other organisms. Some fungi help with decomposition and live off energy from dead organisms. Some fungi are parasitic and they live off of other organisms without giving anything back. A third category are symbiotic and they live off of other organisms, but they also provide benefits to those organisms. Share information about the important role of mycorrhizae for plant growth (read more at *Mycorrhizae and Plants*, <https://kidsgardening.org/garden-how-to-mycorrhizae/>).
 - Fungi help people too! In addition to edible mushrooms, they are used to make things like bread, cheese, and medicines to name just a few.

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SciShow for Kids on YouTube has a fun video called “Fungi: Why Mushrooms are Awesome” that provides an overview of fungi and how they work that you may want to share with students:

<https://www.youtube.com/watch?v=2fooP2ienR0>.

Making Connections

Now that your students are more aware of fungi, return to your garden or green space and specifically search for examples. Before going on your hunt, make sure to explain to kids that many mushrooms are poisonous and that they should never touch or eat any of the mushrooms that they find in the wild. Remind them to observe with their eyes only, and not just because some mushrooms are poisonous: Share with kids that mushrooms are fulfilling an important job in your garden’s ecosystem and so, just like plants and animals, we do not want to interfere with their hard work. Mushrooms are only poisonous if consumed, so let them know that if they do end up touching a mushroom that they must make sure to wash their hands before eating.

Obtain a copy of a mushroom guide or download a nature ID app on your smart phone. The USDA has an extensive Mushroom Field Guide, https://www.fs.fed.us/nrs/pubs/gtr/gtr_nrs79.pdf. The Seek app, https://www.inaturalist.org/pages/seek_app, by iNaturalist offers resources for identifying fungi too. Have kids draw pictures in their garden journals or snap digital photographs of the mushrooms. You can try to identify your mushroom while you are in the field, or wait until you return indoors.

As you collect observations, talk about differences in the size, color, and shape of the mushrooms you discover. Where did you find them? Do you notice any link with the weather (cool vs. hot, wet vs. dry) or conditions (shade vs. sun)? Turn it into a game. Who can find the biggest mushroom? Who can find the smallest mushroom?

Branching Out

Learn more about edible mushrooms. PBS has a video about mushrooms and growing mushrooms available at: <https://www.pbs.org/video/how-does-it-grow-mushrooms/>. You can even grow edible mushrooms with your class. There are many different kinds of mushroom growing kits available for purchase including the Back to the Roots Kits, <https://backtotheroots.com/products/mushroom-grow-kit>, featured in our 2021 Youth Garden Grant Packages.

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