

Ask®

Fantastic Fungus

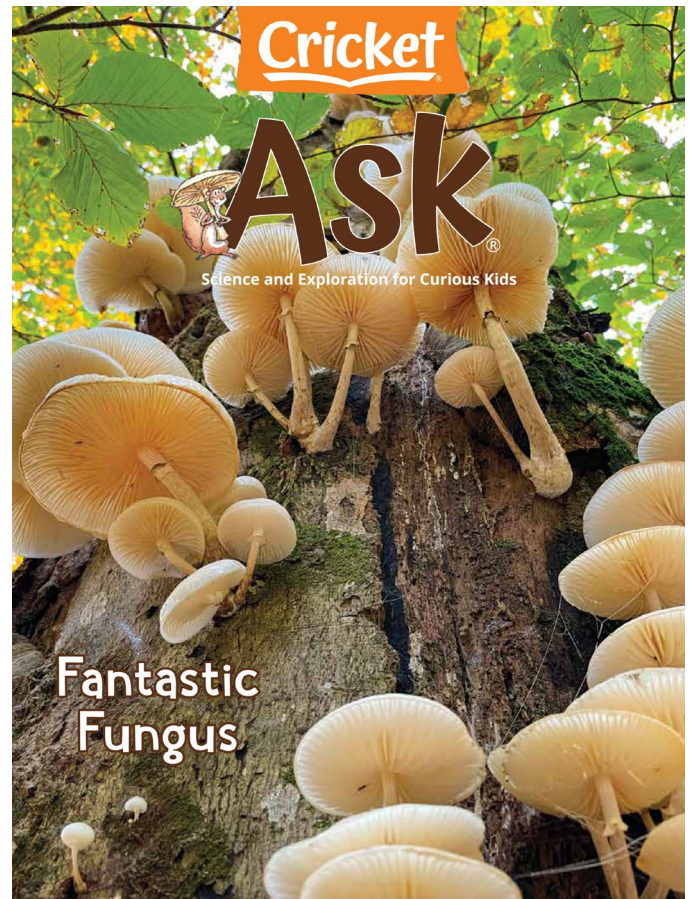
Henry David Thoreau mused, “By the meditation of a thousand little mosses and fungi, the most unsightly of objects become radiant of beauty.” This month’s issue of ASK magazine explores the beauty and function of fungi through vocabulary-rich text and beautiful photographs.

CONVERSATION QUESTION

How do fungi benefit our world?

TEACHING OBJECTIVES

- Students will learn about a variety of mushrooms and how they grow.
- Students will learn about the function of fungi in our world.
- Students will learn how foresters used fungi to solve a tree-growth problem.
- Students will obtain and classify information from a nonfiction text.
- Students will construct explanations.
- Students will analyze a problem-and-solution relationship.
- Students will use word roots and prefixes to determine meanings.
- Students will use the Scientific Method to complete a science experiment.
- Students will use critical thinking skills to consider the duality of nature.



In addition to supplemental materials focused on core STEM skills, this flexible teaching tool offers vocabulary-building activities, questions for discussion, and cross-curricular activities.

SELECTIONS

- **Looking for Mushrooms**
Expository Nonfiction, ~900L
- **Talented Fungi**
Expository Nonfiction, ~1050L
- **The Trees That Would Not Grow**
Expository Nonfiction, ~900L

Ask® Teacher Guide: May/June 2022

Looking for Mushrooms

pp. 6–11 Expository Nonfiction

Readers will go on a mushroom hunt with mycologist Greg Mueller and study a variety of mushrooms. Bright photographs enhance the text, detailing the structure and function of an assortment of fungi.



RESOURCES

Obtaining Information: Mushroom Magic

OBJECTIVES

- Students will learn about a variety of mushrooms and how they grow.
- Students will obtain and classify information from a nonfiction text.
- Students will use word parts to determine meanings.

KEY VOCABULARY

- **mycelium (p. 7)** the thread-like part of a fungus that looks like roots and is usually found underground
- **mushroom cap (p. 8)** the top part of a mushroom
- **gills (p. 8)** the thin structures that hang under a mushroom cap
- **spores (p. 8)** tiny cells that are similar to seeds and that can produce a new plant

ENGAGE

Conversation Question: How do fungi benefit our world?

Create interest in the topic by posing this question: “What is the largest living thing on Earth?” Have the class brainstorm and list responses on the board. Then supply the surprising answer: a huge colony of honey fungus growing under a forest in Oregon. Distribute the article and have the students underline other interesting facts.

INTRODUCE VOCABULARY

Post and discuss the key terms and definitions. Display the title: “Looking for Mushrooms.” Give students a few minutes to create a visual representation (picture dictionary) for the vocabulary words. They may add additional details to their drawings after they have read the article and gathered more information.

READ & DISCUSS

Reinforce comprehension of the concepts and details presented in the article by using the following prompts to direct discussion.

1. What supplies does a mycologist take along on a mushroom hunt?
2. List three forms that fungi can take.
3. What is a fungus?
4. Why have scientists put fungi in their own separate kingdom of life, next to plants and animals?
5. Why isn't Earth overrun with fungi?
6. How does an expert determine if a mushroom is safe to eat?

SKILL FOCUS: Classifying Information

INSTRUCT: Guide students to obtain information from the text, captions, and photos in the article. Remind them that the article was written to teach readers about a variety of mushrooms. Introduce the *Obtaining Information: Mushroom Magic* worksheet and have students match the descriptions with the mushroom species.

ASSESS: After reviewing the worksheet with students, have them categorize the mushrooms into groups. (Ex: by color, size, usage, etc.)

EXTEND

Language Arts Remind students that a scientist who studies fungi is called a mycologist. Break apart this word into its two parts and give the meanings. (**myc** = fungus / **ologist** = person who is an expert in a particular branch of knowledge) Discuss how knowing the meaning of word parts can help students determine the meaning of unfamiliar words. Then set a timer for two minutes and challenge students to list as many “-ologists” as they can. Discuss the meanings of these words.

Mushroom Magic

Obtaining Information Match the description on the left with the correct mushroom on the right.

- | | |
|---|------------------------------|
| 1. They look like little ears on trees. | A. _____ puffballs |
| 2. They sweep gracefully up instead of having a hat-like cap. | B. _____ blue pinkgill |
| 3. They open out like a round flower. | C. _____ bracket fungi |
| 4. They are red with white spots and were used to kill flies. | D. _____ chantarelles |
| 5. They release clouds of dusty spores when crushed. | E. _____ stinkhorn mushrooms |
| 6. They have fancy veils, but they smell terrible. | F. _____ fly agaric |
| 7. They are large, orange, and edible. | G. _____ bird's nest fungus |
| 8. They are leathery and they look like shelves on a tree. | H. _____ wood-ear mushrooms |
| 9. It looks like a tiny nest filled with eggs. | I. _____ chicken-of-the-wood |
| 10. It's bright blue and it only grows in New Zealand. | J. _____ earth stars |

Talented Fungi

pp. 13–17, Expository Nonfiction

There's a fungus among us! Readers will learn how the 1.5 million species of fungus on Earth play an important role in the preservation of the environment and in our daily lives.



RESOURCES

Construct Explanations: Fantastic Fungi

OBJECTIVES

- Students will learn about the function of fungi in our world.
- Students will construct explanations.
- Students will use the Scientific Method to complete a science experiment.

KEY VOCABULARY

- **lichen (p. 13)** a small plant-like organism composed of a fungus and an alga
- **dormant (p. 15)** temporarily inactive
- **enzymes (p. 16)** chemicals in plants and animals that help to cause natural processes, such as digestion

ENGAGE

Conversation Question: How do fungi benefit our world?

Entice students into a game of “20 Questions” in which they will try to guess the topic of the article (fungi). In this game, the players are allowed to ask yes/no questions one by one in order to unravel the mystery. Instead of calling out the answer, have students write their guess on a piece of paper after each question. At the end of the 20 questions, how many students had the word *fungi* written down?

INTRODUCE VOCABULARY

Introduce this as a *Jeopardy!*-style learning activity. Provide the class with only the definitions of the key vocabulary terms. Have them read and discuss. Inform students that they will revisit these definitions after reading and pose the proper question using words from the vocabulary-rich article. (What is *lichen*? What is *dormant*? What are *enzymes*?) Have them formulate 17 more answers needing questions, for a total of 20, and share with other classes as a post-reading activity.

READ & DISCUSS

Read the article aloud with the class. Have students reread the article with a partner to answer the questions below. Discuss responses.

1. Why are edible mushrooms a healthy food?
2. How can fungi make fertile soil on new volcanic islands?
3. Why do truffle hunters often use dogs now instead of pigs for locating truffles?
4. How was the first effective antibiotic created? What was it?
5. How are fungi used in chemical products?

SKILL FOCUS: Constructing Explanations

INSTRUCT: Advise students to review the article and to study how fungi are used for a variety of purposes. Distribute the *Construct Explanations: Fantastic Fungi* graphic organizer and tell the class they will use information from the text to explain how fungi are utilized in each of the categories listed on the worksheet.

ASSESS: Have pairs of students review each other's work, providing suggestions for improvements if necessary. Then challenge pairs to create an alternate title for the article.

EXTEND

Science Explain to students that mold is a type of fungus that grows both indoors and outdoors. It thrives in places with moisture and humidity. Have groups of students create mold using different pieces of food and water and by creating the proper environment. Use a video from the internet to introduce the experiment. Have the students document their experiment using the Scientific Method: Question, Hypothesis, Materials, Procedure, Observation, Conclusion.

Fantastic Fungi

Constructing Explanations Review the article and reread passages that explain how fungi are used for the purposes listed below. Record your answers using specific details.

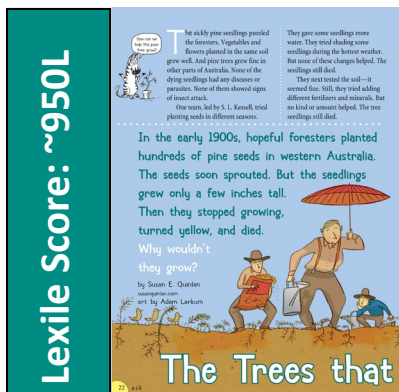
| | |
|--|--|
| How are fungi used for food ? | How are fungi used for drinks ? |
| How do fungi help the environment ? | What are other uses of fungi? |

Fungi

The Trees That Would Not Grow

pp. 22–27, Expository Nonfiction

This article takes the reader on a journey from Australia to Puerto Rico to explore how foresters were facing the same dilemma continents apart.



ENGAGE

Conversation Question: How do fungi benefit our world?

Post the title of the article: “The Trees That Would Not Grow.” Tell the class that the article is about pine seedlings that were withering away instead of growing tall and healthy. Inform the class that pine trees are categorized as coniferous trees. These are cone-bearing trees with needle-like leaves that stay green all year long. Pose this question: How many types of coniferous trees can you name? As a post-reading activity, allow students to search the web to learn more.

INTRODUCE VOCABULARY

Post and discuss the key terms. Be sure that students understand the definitions before reading the text. As a post-reading activity, have students use the three vocabulary words to summarize the article in paragraph form.

READ & DISCUSS

Pose the following questions to students to prompt meaningful discussion following the reading of the article.

1. What observation stopped foresters in Australia from giving up on their seedlings?
2. What is soil composed of?
3. How did Kessell’s team test their ideas?
4. List two hypotheses regarding the dying of the tree saplings.
5. How do plants and trees benefit from having a fungus partner?
6. Why were foresters in Puerto Rico able to determine that fungi were responsible for the health of their plants?

SKILL FOCUS: Problem and Solution

INSTRUCT: Inform students that they will be rereading the article with a partner and highlighting passages that show how the primary problem (pine seedlings not thriving) was solved. Distribute copies of the *Problem and Solution: Pine Problems* graphic organizer, and tell students they will be responsible for recording the problem-and-solution relationship from the article and explaining *why* the solution worked.

ASSESS: Collect worksheets and assess the students’ ability to analyze the problem-and-solution relationship.

EXTEND

Critical Thinking Page 27 of the article states, “People often consider certain parts of nature good and other parts bad.” The paragraph goes on to explain that the more ecologists learn about connections in nature, the more this view is changing. Living things that seem of little value are often surprisingly important. Have pairs of students discuss this duality of nature. For example, rain is necessary to maintain life on this planet (good), but too much/too little rain can devastate areas of the globe (bad). Encourage pairs of students to share their examples and ideas with the class.

RESOURCES

Problem and Solution: Pine Problems

OBJECTIVES

- Students will learn how foresters used fungi to solve a tree-growth problem.
- Students will analyze a problem-and-solution relationship.
- Students will use critical thinking skills to consider the duality of nature.

KEY VOCABULARY

- **forester (p. 22)** a person whose job is to take care of forests by planting, managing, and caring for trees
- **withered (p. 24)** became dry and weak
- **hyphae (p. 24)** the tiny white threadlike structures of a fungus that form an underground network

Pine Problems

Problem and Solution Revisit the article and thoroughly complete the chart below. Include specific information and supply details.

Problem:

Attempted Solutions:

Successful Solution:

Why did it work?