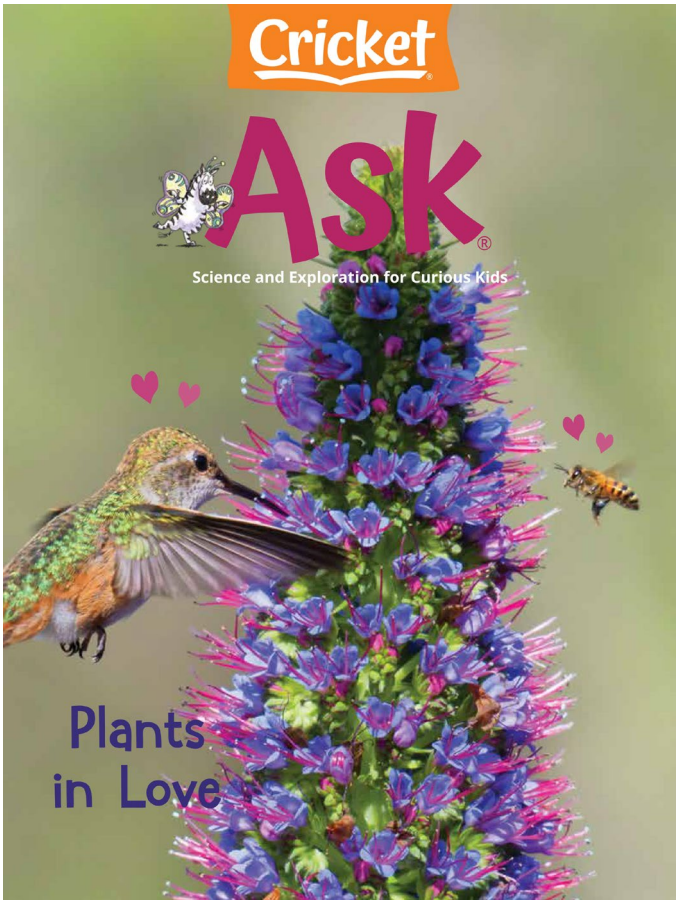
Ask® Teacher Guide: September 2021

Plants in Love

This month's issue of ASK magazine journeys through gardens and orchards to teach readers how a mutually beneficial relationship exists between most of the plants and insects in nature. Students will learn about pollination, growth cycles, and symbiotic relationships.



CONVERSATION QUESTION

How do plants grow and thrive?

TEACHING OBJECTIVES

- **Students will learn how pollinators help the natural world flourish.**
- **Students will learn how insects and animals enrich a garden.**
- **Students will learn about the growth cycle of apples.**
- **Students will examine the biological process of pollination.**
- **Students will define cause-and-effect relationships.**
- **Students will obtain information from a nonfiction text.**
- **Students will learn about the Pollinator Conservation Program.**
- **Students will write a persuasive essay.**
- **Students will utilize a balance scale to weigh apples.**

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

- **Pollen Partners**

Expository Nonfiction, ~620L

- **Garden Friends**

Expository Nonfiction, ~800L

- **How to Grow an Apple**

Expository Nonfiction, ~500L

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Pollen Partners

pp. 12–17, Expository Nonfiction

This article explores the process of pollination and the role that insects and animals play in perpetuating fertilization in nature. Bright photographs with informative captions enhance the text.

Lexile Score: ~620L

RESOURCES

Blossom to Blossom: Biological Process

OBJECTIVES

- Students will learn how pollinators help the natural world flourish.
- Students will examine the biological process of pollination.
- Students will learn about the Pollinator Conservation Program.

KEY VOCABULARY

- ***lure* (p. 13)** to cause or persuade a person or an animal to go somewhere
- ***pollinators* (p. 13)** animals and insects that carry pollen from plant to plant

ENGAGE

Conversation Question: How do plants grow and thrive?

Display the title of the article, "Pollen Partners," and remind students that bees are the world's most important pollinators. Point out that America is home to over 4,000 species of native bees. Explain that there are clues to a bee's behavior or appearance in its name. Have students choose a "pollen partner" and infer information from the following bee names: carpenter bee, leafcutter bee, honeybee, blue mason bee. When reading the article, have the class stop and study pages 16–17 to check their inferences.

INTRODUCE VOCABULARY

Post the key terms and discuss the definitions. Then display the following questions and have students supply the correct answers:

- How can a store manager **lure** customers into their store?
- How can humans assist **pollinators**?

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 is pollen referred to as "the plant's message of love"?
2. What is the difference between plants that rely on the wind for pollination and those that rely on insects and animals?
3. How does color play a role in pollination?
4. Why do butterflies only lay their eggs on milkweed plants?
5. What is "buzz pollination"?

SKILL FOCUS: Process of Pollination

INSTRUCT: This article presents the reader with detailed information about the many ways pollination occurs, focusing on the animals and insects that help facilitate the process. Present the *Blossom to Blossom: Biological Process* graphic organizer and tell students they will be recording details about the various pollination methods. Explain that they will need to consult the article and use critical thinking skills to record accurate information.

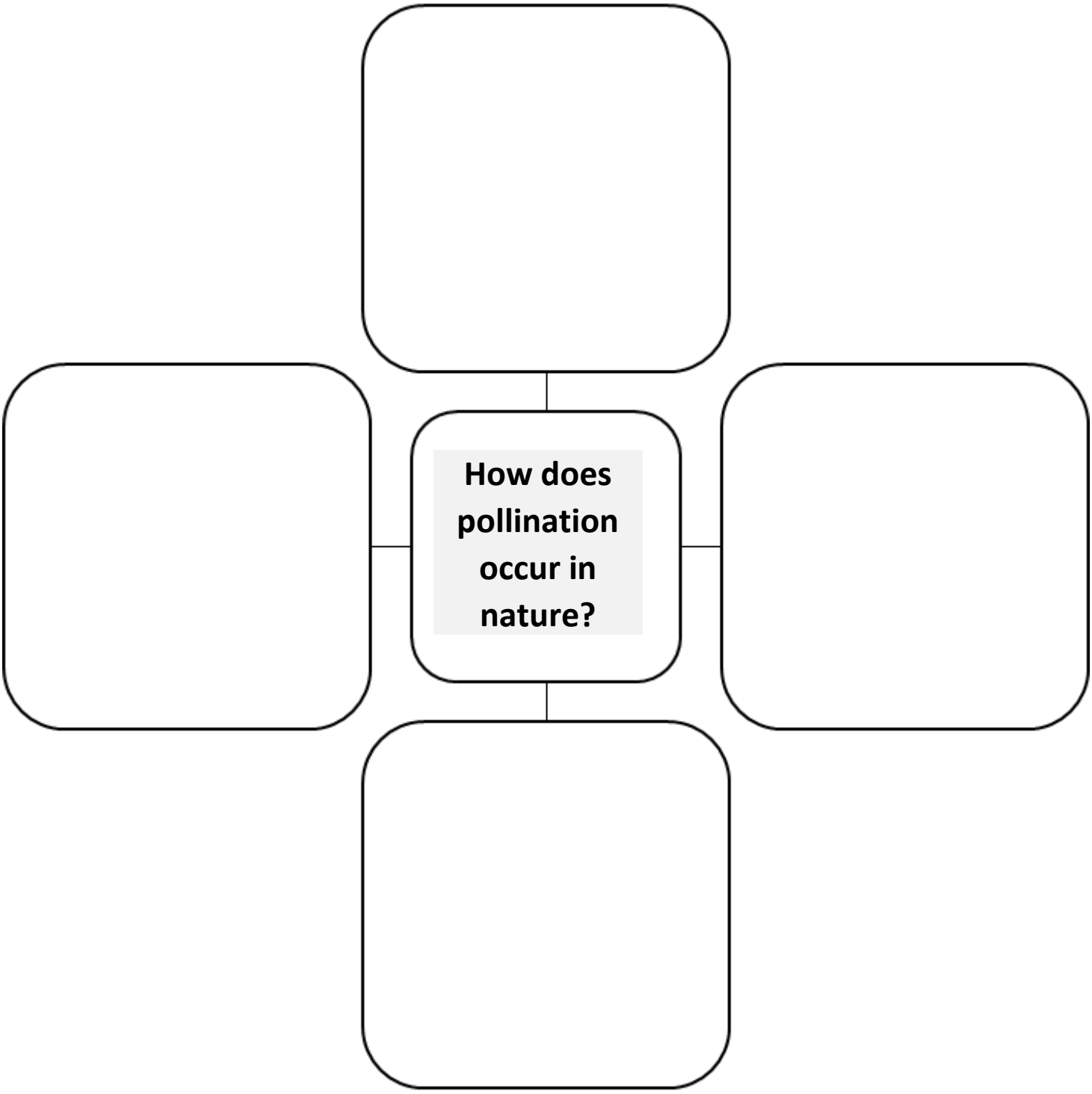
ASSESS: The objective of this lesson is to help students learn about pollination. After reviewing the organizer, have students choose one insect or animal mentioned in the text and write a paragraph detailing the specific manner in which it assists nature with this process.

EXTEND

Science The article suggests that students learn more about helping native bees by visiting www.xerces.org/pollinator-conservation. This campaign is focused and four simple principles and is age-appropriate and free. Explore the website with students.

Blossom to Blossom

Biological Process Reread the article and underline sentences that detail the different methods of pollination. Think about the role of humans, as well. Explain four different ways that plants can be pollinated.



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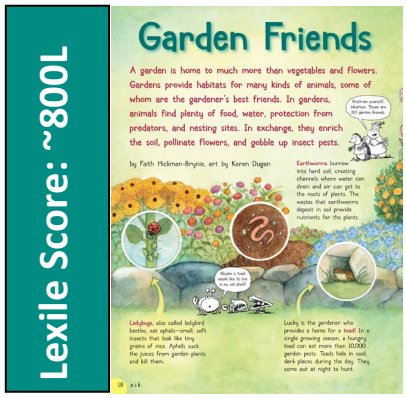
Garden Friends

pp. 18–19, Expository Nonfiction

Grab your gardening gloves and begin the search for new friends. This article takes readers beyond the flowers and vegetables and helps them to appreciate the relationship between the garden and its inhabitants.



RESOURCES

Coexist and Assist: Cause and Effect

OBJECTIVES

- Students will learn how insects and animals enrich a garden.
- Students will define cause-and-effect relationships.
- Students will write a persuasive essay.

KEY VOCABULARY

- ***habitat* (p. 18)** the natural home or environment of an animal or plant
- ***nesting site* (p. 18)** a place chosen by an animal for preparing its nest and laying eggs
- ***transfer* (p. 19)** to move someone or something from one place to another

ENGAGE

Conversation Question: How do plants grow and thrive?

Display the title of the article, "Garden Friends." Discuss how gardens can provide food, water, and protection to many insects and animals. Give students three minutes to list as many garden inhabitants as they can. Have students share their lists. Then have students brainstorm how these creatures might be beneficial or harmful to a garden.

INTRODUCE VOCABULARY

Post and discuss the vocabulary words and definitions. Have students Think-Pair-Share with a partner. Give them the following brainstorming directives, one at a time:

- Discuss how an animal might choose a **nesting site**.
- Describe what you might see when observing a ladybug's **habitat**.
- Explain how a bee can **transfer** pollen.

READ & DISCUSS

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

1. List three functions that a garden serves for insects and animals.
2. List three services that insects and animals provide for a garden.
3. Why is a gardener lucky when a toad makes a home in their garden?
4. Why are butterflies attracted to bright, odorless flowers?
5. What features make a praying mantis unique?

SKILL FOCUS: Cause and Effect

INSTRUCT: Help students recognize the many cause-and-effect relationships (a relationship in which one event makes another event happen) that are presented in this article. Introduce the *Coexist and Assist: Cause and Effect* graphic organizer and advise students that they will be recording these relationships. Explain that students should focus on how the cause-effect relationship is mutually beneficial for the insect/animal and the garden.

ASSESS: Review the graphic organizers. If necessary, direct students to revisit the text and adjust answers. Have students work in small groups to complete the Think-Pair-Share activity at the bottom of the page.

EXTEND

Language Arts Remind students that the author of this article poses a question at the end: "Who gains more—the gardener or the gardener's animal helpers?" Have the students write a persuasive essay to answer this question, using facts, examples, and quotes from the article to support their ideas. Remind students that the purpose of this essay is to convince readers that their assertion is valid. If necessary, students may do additional research to support their claim.

Coexist and Assist

Cause and Effect Refer to the article to determine how the insect and animal actions are beneficial to the garden.

Actions	Effects
1. Earthworms burrow into hard soil.	1.
2. Hummingbirds dine on nectar.	2.
3. Bees visit flowers to collect pollen.	3.
4. Ladybugs eat aphids.	4.
5. Garter snakes eat slugs.	5.

Think-Pair-Share: Humans also can have a huge impact on gardens and natural habitats. Discuss actions that people take that are beneficial to gardens. In addition, discuss human activities and actions that can jeopardize the balance of a healthy garden.

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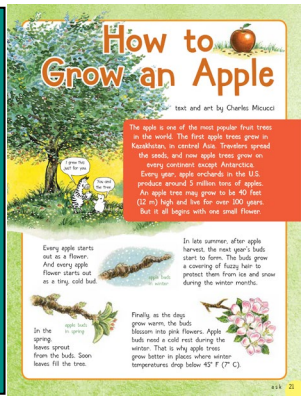
How to Grow an Apple

pp. 21–25, Expository Nonfiction

The apple tree is one of the most popular fruit trees in the world, with an estimated 30 million in the United States alone. This article examines the growth from bud to blossom to apple, while providing juicy "bites" of information throughout.

Lexile Score: ~500L



RESOURCES

A Is for Apple: Obtain Information

OBJECTIVES

- Students will learn about the growth cycle of apples.
- Students will obtain information from a nonfiction text.
- Students will utilize a balance scale to weigh apples.

KEY VOCABULARY

- ***orchard* (p. 22)** an area of land planted with fruit trees
- ***grafted* (p. 24)** attached a twig or bud from one plant to another plant so that they are joined and grow together
- ***scion* (p. 25)** a young shoot or twig of a plant

ENGAGE

Conversation Question: How do plants grow and thrive?

Ask students how many apples they think are needed to produce one gallon of apple cider. List responses on the board. Then reveal the answer: 36 apples. Have students calculate the difference between their prediction and the actual answer. Share a short video showing how apple cider is made from apples (available on the internet).

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 a question using words from the vocabulary-rich article. (What is an orchard? What is grafted? What is a scion?) Have them formulate 17 more answers needing questions, for a total of twenty, and share with other classes as a post-reading activity.

READ & DISCUSS

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

1. Why do apple trees grow better in places where winter temperatures drop below 45 degrees Fahrenheit?
2. What produces the energy needed to grow fruit in plants?
3. Explain why the apples would all be different if you grew several trees from the seeds inside a single apple.
4. How do the pollen parent and the flower parent contribute to the apple's traits?
5. Why do apple growers use grafting?

SKILL FOCUS: Obtain 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 the life cycle, genetic traits, and growth process of apples. Introduce the *A Is for Apple: Obtain Information* worksheet. Review directions and have students complete the activity.

ASSESS: Review students' answers and have them make corrections.

EXTEND

Mathematics Provide students with a balance scale, a variety of apples, and a set of weights (or counters). Review how to accurately measure the weight of an object by placing weights in a pan to create balance. Have students create a three-column chart headed as follows: Prediction/Actual/Difference. Distribute several apples to each small group and have them obtain a weight and record the data. Use the apples for other activities such as seed counting or star printing.

A Is for Apple

Obtain Information Read through the sentences below and note the choice of answers. Revisit the article and then underline the correct answer to complete each sentence.

1. Every apple starts out as a **(vegetable/flower/leaf)**.

2. The first apple trees grew in **(Kazakhstan/Kansas/Central America)**.

3. The male parts of the flower are called **(pistils/sepals/stamens)**.

4. In plants, **(leaves/roots/flowers)** produce the energy needed to grow fruit.

5. When the apple flower has been pollinated, the **(pistil/petals/leaves)** fall(s) off.

6. The female pollen-collecting part of the flower is the **(nectar/ovule/pistil)**.

7. In grafting, the **(scion/bark/weather)** controls what type of apples will grow.

8. The flower's ovary grows into the seeds and **(leaves/core/flower)**.

9. Pollen and ovule merge to make a/an **(seed/apple/flower)**.

10. Nectar, a sweet liquid, is found in the **(stem/center/sepal)** of the flower.

11. At the tips of the pollen-coated stamen are pads called **(antlers/thorax/anthers)**.

12. The buds' fuzzy hairs protect them from **(predators/ice/sun)**.

13. The base of the apple flower contains **(five/seven/two)** small chambers.

14. Every **(stamen/stem/seed)** in an apple forms one ovule and one pollen grain.

15. Apples grow on every continent except **(China/Asia/Antarctica)**.