



The Life Cycle of a Plant

4_A

Introducing the Read-Aloud

10 minutes

What Have We Already Learned?

5 minutes

Remind students that during the last few lessons they learned about the seasonal cycle. Have students identify characteristics of the four seasons, including which plants and animals they see most often during each season. Show students Image Cards 1–4 to help guide the students' discussions and to help them formulate answers. You may wish to have students sequence Image Cards 1–4. Tell students that in today's lesson they are going to learn about another cycle in nature.

Vocabulary Preview

5 minutes

Pollinator/Pollination



← Show image 4A-5: Insect pollinators



← Show image 4A-6: Mammal and bird pollinators

1. In today's read-aloud you will hear that flowering plants need *pollinators* to help them with *pollination*.
2. Say *pollinator* with me three times.
Say *pollination* with me three times.
3. A pollinator is something that carries pollen—or powder made from flowers—from plant to plant.
Pollination happens when a pollinator carries the pollen—or powder—from one plant to another plant so that the other plant can make seeds.
4. Insects are the number-one pollinators. Insects help with the pollination of flowering plants.

5. Can you name some pollinators in these pictures? (honeybee, butterfly, hummingbird)
What is the job of a pollinator? (help with pollination)

Reproduce

1. Today we will learn how plants grow and *reproduce*.
2. Say *reproduce* with me three times.
3. To reproduce means to make babies or new plants.
4. Plants reproduce by making seeds that can grow into new plants.
5. What do sunflower seeds reproduce? (sunflowers)
What do humans reproduce? (humans)
What do oak trees reproduce? (oak trees)
What do chickens reproduce? (chickens)

Purpose for Listening

Remind students that each of the four seasons has different characteristic temperatures and amounts of sunlight. Plants and animals are affected by the temperatures and sunlight in each season. Ask students to listen carefully to today's read-aloud to find out about the main topic: the life cycle of a flowering plant.



The Life Cycle of a Plant

← Show image 4A-1: New plant life

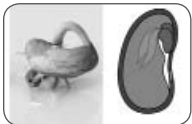
- 1 Name the four seasons in order.
- 2 Some living things have longer life spans than others. Some flies only live for a few days, but people can live to be over one hundred years old!

All living things pass through stages from birth to adult called a life cycle. For many living things, the cycle of life follows the four seasons of the year.¹ For some living things, the cycle of life is short and is completed in just days, months, or a single year. For other living things, the cycle of life continues for many, many years.²



← Show image 4A-2: Flowering plants

Today you will learn about the life cycle of a flowering plant. Just think about all the flowering plants you see in the parks, yards, gardens, fields, and meadows. Our world is awash with colorful, vibrant flowering plants. How do these plants grow and **reproduce**, or make seeds for new plants? Let's find out.



← Show image 4A-3: Germination

A flowering plant begins its life cycle as a seed. Seeds need special conditions to germinate, or begin to grow. Spring provides seeds with the right conditions to grow. Therefore, the life cycle of a flowering plant begins in spring.

- 3 Why is there more sunlight and warmth in spring? (Temperatures begin to increase in spring because wherever this season is occurring, that part of earth is now facing the sun and receiving more sunlight.)
- 4 Roots, stem, and leaves are the three main parts of a young plant.

In spring, there is more sunlight and temperatures are warmer.³ Seeds need just the right amount of light from the sun, nutrients from the soil, and water in order to grow. Once the seed germinates, or sprouts, it grows and develops into a young plant with roots, a stem, and leaves.⁴ The first leaves unfold to allow photosynthesis to begin. Photosynthesis is the process by which plants make their own food, as well as oxygen. Plants use sunlight and water to make food in the form of glucose, a type of sugar.



← **Show image 4A-4: Interior of flower**

5 The word *emerge* means to become visible, or able to be seen.

In the warmth of spring and summer, plants continue to grow. The young plant is called a seedling. Gradually, a plant's stem will grow taller and true leaves will **emerge**.⁵ Once the plant matures, or become an adult plant, flowers appear.

In order for a flowering plant to reproduce, or produce seeds that will make new flowering plants, it must be pollinated. Pollination is when pollen from one flower mixes with the pollen of another flower so that the plant can make seeds.

But how is pollen transferred from one place to another? In other words, how does pollination occur? Flowering plants need **pollinators** to help them with pollination. Pollinators are insects, birds, and other animals that are **attracted** to the shape, fragrance, or color of a flower. Without pollinators, most flowering plants would not produce seeds and fruit.⁶

6 Remember, plants need pollen from other plants in order to make seeds. Pollinators carry pollen from flower to flower.



← **Show image 4A-5: Insect pollinators**

There are many types of pollinators, such as birds and small mammals, but insects are the number-one pollinators of flowering plants. The flowers of a flowering plant are designed to attract various pollinators, especially insects. The shape, fragrance, and color of the flower, as well as the sweet-tasting nectar contained within the flower itself, attract many different kinds of insects. As insects move from flower to flower, the sticky substance called pollen clings to their bodies and is transferred, not only within a flower, but from flower to flower.⁷

7 Honeybees, bumblebees, ants, moths, beetles, and flies are just some of the insect pollinators.

Honeybees are the most common pollinators. They carry out more pollination than any other insect. Some scientists think that bees are attracted to bright blue and violet-colored flowers, whereas butterflies like fragrant yellow, pink, red, and orange flowers. Butterflies also like wide petals so that they can settle on them while they drink the sweet nectar.



← **Show image 4A-6: Mammal and bird pollinators**

8 [Point out the shape of each bird's beak in the image. Show students a tube in your classroom for reference.]

Birds are important pollinators, too, especially of wildflowers. For example, hummingbirds have perfectly designed beaks that can reach the nectar inside long, tubular-shaped flowers.⁸ There are more than 2,000 different kinds of birds in the world that feed on nectar. Birds have a poor sense of smell and help to pollinate unscented flowering plants because they are attracted by the color and shape of the flowers.

A variety of small mammals pollinate flowering plants. Mice, shrews, and rats—even tree-dwelling animals such as lemurs and small monkeys—can help to transfer pollen. People also help the pollination process. Often, when people are working in their flower gardens, the sticky pollen is accidentally carried from flower to flower.

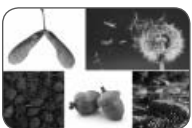
For some plants, pollination does not just occur during the daytime. Some scented flowers attract nighttime pollinators such as bats and moths.⁹

9 Here, the word *bats* means a small, furry animal with wings. The word *bats* also means to hit a baseball.

Although ninety percent of flowering plants are pollinated by animals, especially insects, the wind and even water can play a part, too. Pollen is carried by the wind. Flowering plants that live in water, such as lilies, can be pollinated as the water carries the pollen from one plant to another.

Once pollen has been transferred and reaches the new plant, the flower produces seeds. The next part of the process is called seed dispersal. This is the process of carrying the seeds away from the parent plant so that the flowering plant life cycle can begin all over again.¹⁰

10 Most seeds are dispersed in late summer and fall.



← **Show image 4A-7: Seed dispersal**

Just like pollination, there are various ways that seeds can be dispersed, or spread apart in different directions. Many flowering plant seeds are carried away from the parent plant by the wind. As the wind blows, the seeds are carried up into the air. Some flowering plants have pods, or capsules, that explode, sending

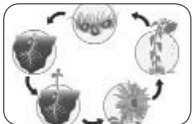
11 Why might it be important for seeds to be dispersed, or spread apart from each other?

12 This protective layer keeps the seed safe.

forth a burst of tiny seeds into the air. Other flowering plants drop their seeds into rivers and streams, and the seeds are carried along to their new home.¹¹

Sometimes animals carry seeds from place to place without knowing it. Some seeds contained within a **protective** casing can attach themselves to the fur of passing animals.¹² The protective casing will eventually fall off the animal and rest in the soil, ready to begin the life cycle process.

Some seeds are contained within a fruit that animals like to eat. Animals either spit the seeds out, or they eat them, and the seeds reach the earth in the animal droppings that are left behind. Once on the ground, they rest in the soil until the germination process can begin again the following spring.



← **Show image 4A-8: Seed to seed**

All of this is happening around us in spring, summer, and early autumn. The potential for new life is being created as flowering plants are pollinated and seeds are dispersed. Across the world, the life cycle of flowering plants is renewed, or happens again, each year.

Discussing the Read-Aloud

15 minutes

Comprehension Questions

10 minutes

If students have difficulty responding to questions, reread pertinent passages of the read-aloud and/or refer to specific images. If students give one-word answers and/or fail to use read-aloud or domain vocabulary in their responses, acknowledge correct responses by expanding students' responses using richer and more complex language. Ask students to answer in complete sentences by having them restate the question in their responses.

1. *Literal* What is the main topic of the read-aloud? (The main topic of the read-aloud is the life cycle of a flowering plant.)
2. *Literal* What is the first stage of the life cycle of a flowering plant? (The first stage of the life cycle of a flowering plant is as a seed.)

3. *Inferential* What happens after a seed is planted? (Once the seed has germinated, it grows and develops into a young plant with roots, a stem, and leaves.)
4. *Inferential* Which one of the four seasons is the best time for planting seeds? (spring) Why? (In spring there is more sunlight and there are warmer temperatures, as well as enough water. These conditions allow seeds to germinate.)
5. *Inferential* How do flowering plants attract pollinators? (Flowering plants use their fragrance, shape, and color to attract pollinators.)
6. *Inferential* How does a hummingbird’s beak help it to pollinate flowers? (A hummingbird’s beak is perfectly designed to reach nectar inside long, tubular-shaped flowers and therefore helps to pollinate them.)
7. *Literal* Besides animals, what other ways can plants be pollinated? (The wind and water can help to pollinate plants.) How? (Pollen is carried by the wind. Flowering plants that live in water can have their pollen carried from flower to flower by the water.)
8. *Literal* Name three kinds of seed dispersal, or ways seeds are spread in different directions. (Three kinds of seed dispersal are animals, the wind, and water.)

[Please model the *Question? Pair Share* process for students, as necessary, and scaffold students in their use of the process.]

9. *Evaluative What? Pair Share:* Asking questions after a read-aloud is one way to see how much everyone has learned. Think of a question you can ask your neighbor about the read-aloud that starts with the word *what*. For example, you could ask, “What are the three main parts of a young plant?” Turn to your neighbor and ask your *what* question. Listen to your neighbor’s response. Then your neighbor will ask a new *what* question, and you will get a chance to respond. I will call on several of you to share your questions with the class.
10. After hearing today’s read-aloud and questions and answers, do you have any remaining questions? [If time permits, you may wish to allow for individual, group, or class research of the text and/or other resources to answer these questions.]

Word Work: Protective

5 minutes

1. In the read-aloud you heard, “Some seeds contained within a *protective* casing can attach themselves to the fur of passing animals.”
2. Say the word *protective* with me.
3. *Protective* means something that is intended to shelter or keep something or someone safe.
4. An umbrella is a *protective* cover or shelter from the rain.
5. Can you think of other items that are designed to be *protective* or provide a means of protection? For example, a helmet is a protective cover for the head, and a shin guard is a protective cover for the shins.
[Ask two or three students. If necessary, guide and/or rephrase the students’ responses: “A _____ is a protective cover for _____.”]
6. What’s the word we’ve been talking about?

Use a *Making Choices* activity for follow-up. Directions: I am going to read several sentences. If what I describe is something that is protective, say, “That is protective.” If what I describe is something that is not protective, say, “That is not protective.” Remember to answer in complete sentences.

1. using bug spray to keep mosquitoes away (That is protective.)
2. wearing a helmet when you ride your bike (That is protective.)
3. eating pizza (That is not protective.)
4. using an umbrella when it rains (That is protective.)
5. climbing a tree (That is not protective.)
6. wearing shin guards when you play soccer (That is protective.)



Complete Remainder of the Lesson Later in the Day



The Life Cycle of a Plant

4_B

Note: Extensions may have activity options that exceed the time allocated for this part of the lesson. To remain within the time periods allocated for this portion of the lesson, you will need to make conscious choices about which activities to include based on the needs of your students.

Extensions

20 minutes

↔ Multiple Meaning Word Activity

5 minutes

Sentence in Context: Bat

Note: You may choose to have students hold up one, two, three, or four fingers to indicate which image shows the meaning being described, or have a student walk up to the poster and point to the image being described.

1. [Show Poster 3M (Bats).] In the read-aloud you heard, “Some scented flowers attract nighttime pollinators such as *bats*.” Here *bat* is a small, flying animal that is awake at night. Which picture shows an animal that is a bat?
2. *Bat* can also mean something else. *Bat* also means to hit a ball using a bat. Which picture shows somebody about to bat?
3. *Bat* also means to close and open your eyes very quickly. Which picture shows a boy batting his eyes?
4. A bat is also something used in baseball to hit the ball. Which picture shows a baseball bat?
5. Now with your partner, make a sentence for each meaning of *bat*. Remember to be as descriptive as possible and use complete sentences. I will call on some of you to share your sentences. [Call on a few student pairs to share one or all of their sentences. Have them point to the part of the poster that relates to their use of *bat*.]

Plant-related Compound Words

| Teacher Reference Chart | | | |
|------------------------------|--------|------------|-------|
| Plant-related Compound Words | | | |
| Flowers | | Fruit/Food | |
| bell | flower | black | berry |
| butter | cup | blue | berry |
| blue | bell | straw | berry |
| rose | bud | grape | fruit |
| sun | flower | pepper | mint |
| water | lilly | pine | apple |
| fox | glove | sea | weed |
| holly | hock | soy | bean |
| sweet | pea | water | melon |
| Pollinators | | | |
| honey | bee | horse | fly |
| butter | fly | lady | bug |
| humming | bird | sun | bird |

Note: The purpose of these syntactic activities is to help students understand the direct connection between grammatical structures and the meaning of text. These syntactic activities should be used in conjunction with the complex text presented in the read-alouds. There may be variations in the sentences created by your class. Allow for these variations, and restate students’ sentences so that they are grammatical. If necessary, have students repeat the sentence after you.

Directions: Today we are going to practice making and using compound words. When two words are added together to form a new word, it is called a compound word. If you know the meaning of the two words, you will most likely be able to tell the meaning of the new compound word.

1. In today’s read-aloud we heard several compound words. Listen to my sentences, and raise your hand if you hear a compound word. Remember, compound words are two words added together to make a new word. Tell me which two words make a compound word. Then, try to guess the meaning of the compound word based on what you know about the two words that make up the compound word.

- *Honeybees* are the most common pollinators. (honey+bee = a bee that makes honey)
 - *Butterflies* like fragrant yellow, pink, red, and orange flowers. (butter+flies = insects with colorful wings that can fly)
2. [Give each student an index card with part of a compound word written on it.] I have given you one half of a compound word. Try to find the match for your word on the board. Make up a sentence using your compound word.
 3. [Invite students to come up to the board and put their index card next to a word on the board to create a compound word.] What compound word did you make? What does your compound word mean? Can you use it in a sentence?

[If you have examples or samples of any of the compound words, show them to the class as the word is being presented.]

Extending the Activity

Ask students whether they notice the any themes with the compound words (e.g., fruits, flowers, and pollinators). Have them group the compound words according to theme.

↔ **Vocabulary Instructional Activity**

5 minutes

Word Work: Process

1. In the read-aloud you heard, “Photosynthesis is the *process* by which plants make their own food, as well as oxygen.”
2. Say the word *process* with me three times.
3. The word *process* means a series of actions that create something.
4. The writing process includes the steps you take to write a paragraph.
5. Do you remember the steps to the writing process? (plan, draft, edit) [Ask two or three students. If necessary, guide and/or rephrase the students’ responses: “The steps of the writing process are . . . ”]
6. What’s the word we’ve been talking about?

Use a *Discussion* activity for follow-up. Directions: Tell your partner about the process of getting ready for school in the morning. Mention at least three steps in the process as you talk to your partner. [Encourage the use of temporal words: *First*, *Next*, and *Last*.]

10 Sequencing the Life Cycle of a Flowering Plant (Instructional Masters 4B-1 and 4B-2)

15 minutes

- Show students Image Cards 5–9, and have them explain and sequence the life cycle of a flowering plant. You may wish to show students Cycles Poster 2 (Flowering Plant Life Cycle) and have them once again identify the five stages of the life cycle of a flowering plant. (seed, sprout/germination, seedling, adult flower, seed dispersal)
- Give students Instructional Masters 4B-1 and 4B-2. Tell them that they will create Response Card 3; it will show the life cycle of a sunflower. [**Note:** This Response Card should be held and viewed using landscape orientation.]
- First, have students cut out the images of the stages in the life cycle of a sunflower plant on Instructional Master 4B-1.
- Next, have them put the images in the correct order of the life cycle of the sunflower plant.
- Then, students should glue or tape the images in the correct blanks on Instructional Master 4B-2.
- Finally, have students describe the life cycle of a sunflower plant to their partner or home-language peers.