



The Life Cycle of a Tree

5_A

Introducing the Read-Aloud

10 minutes

What Have We Already Learned?

5 minutes

Review with students that a cycle is a sequence of events that repeats itself again and again. A life cycle includes the stages of a living thing's life, from seed to adult. Remind students that a plant's life cycle begins with a seed. Have students identify the stages of the life cycle of a plant, using image 4A-8. (seed, sprout/germination, seedling, adult flower, seed dispersal) Show students Image Cards 5–9 to help guide their discussion and to help them formulate answers. You may also wish to have students refer back to their sequenced plant life cycles from the Extension in Lesson 4.

Vocabulary Preview

5 minutes

Decomposers/Decompose

1. In today's read-aloud you will hear that decomposers—such as earthworms, bacteria, and fungi—help to *decompose* dead trees.
2. Say *decomposers* with me three times.
Say *decompose* with me three times.
3. Decomposers are living things that help to break down dead plants and animals into small pieces.
To decompose means to break down into little pieces, usually to return to the soil.
4. [Show images of different decomposers.] Earthworms, bacteria, and fungi are examples of decomposers.
Decomposers help to decompose dead plants so that the plants become part of the soil again.
5. Have you ever seen a decomposer in real life?
What is the job of a decomposer? (to help decompose dead plants and animals)



Germination

← **Show image 5A-5: Close-up of germinated tree seed**

1. Today we will learn that *germination* is when a seed begins to grow.
2. Say *germination* with me three times.
3. Germination is the growing or sprouting of a seed. It is the very beginning of the life cycle of a plant.
4. If you plant a seed in a clear cup, you might be able to see the germination process.
5. How can you tell that there is germination happening to this seed in the picture?

Is germination at the beginning, middle, or end of a plant's life cycle?

Does germination happen to flowers, leaves, or seeds?

For a seed to sprout or germinate, it needs water and warmth. What time of year do you think germination happens—winter or spring?

Purpose for Listening

Have students listen carefully to learn how a tree's life cycle may be similar to or different from that of other types of plants. Tell students to listen carefully to the main topic of the read-aloud: the life cycle of a tree.



The Life Cycle of a Tree

← Show image 5A-1: Trees

There are certain things on Earth that make life possible. We need water to live, just as we need the air that we breathe. Have you ever thought about where the air that you breathe comes from? The air that you breathe is totally **dependent** on, or supported by, the existence of trees. Without trees, humans could not live on Earth.

There are thousands of different kinds of trees in the world. There are towering Sequoia trees and tiny dwarf willows. There are noble oak trees and scented pines. They all help to make life possible on this planet.



← Show image 5A-2: Tree taking in carbon dioxide and emitting oxygen

Trees provide us with many things and perform tasks that you might not even be aware of. For example, trees provide us with oxygen to breathe. Trees also take in carbon dioxide through their leaves. Carbon dioxide is a greenhouse gas, meaning that if too much of it builds up in Earth's atmosphere, our planet will heat up. Therefore, trees help to manage Earth's climate and keep it livable for us. Tree roots help to fight soil erosion and flooding by holding the soil together and absorbing water from the soil.¹ Finally, we use trees, or the wood that comes from trees, all over the world for all kinds of things. Can you think of three things that the wood from trees is used for?²

1 Tree roots help stop the soil from wearing away over time.

2 [Pause for student responses.]



← Show image 5A-3: Tree parts

Let's review the different parts of a tree.³ Do you remember what the main stem of a tree is called? The main stem of a tree is called the trunk. All the branches of the tree grow out of the trunk. Tree leaves grow on the branches. The roots hold the tree in the ground. They not only hold the tree in the ground, they help to feed the tree, too. Roots absorb water and nutrients from the

3 We learned all about tree parts in the *Plants* domain in Kindergarten.

- 4 *Absorb* means to take in, just like a sponge absorbs water.
- 5 Tree leaves produce food through photosynthesis, just like the leaves of flowering plants.
- 6 Bacteria are very small living things that often cause disease.



← **Show image 5A-4: Tree seeds**

ground.⁴ The water and nutrients travel up from the roots through the trunk and into the branches. Do you know why leaves are such an important part of a tree? Leaves are important because they enable the tree to produce food.⁵ Another important part of the tree is the outside layer called the bark. The bark protects the tree from outside forces such as heat, cold, insects, and bacteria.⁶

Trees follow the same life cycle as other plants. Just like that of a flower, a tree’s life cycle begins with a seed. Tree seeds can be as large as tennis balls, or as tiny as freckles. They come in various shapes and sizes, too. They can be flat, smooth, bumpy, long, or thin. Tree seeds have three main parts. They are the embryo, or egg; the stored food inside the egg, which enables the seed to grow and change; and the seed coat, which eventually falls off.

Most seeds are carried away from the parent tree that produced them. Do you remember how seeds are dispersed, or spread apart? They are dispersed in various ways. They are carried by animals, people, wind, and water. Wherever they land, they rest in the soil until germination begins.

Germination is when a seed begins to grow, or sprout. Certain conditions are required for germination to happen. We have learned that in the temperate parts of the world, the seasons affect the life cycle of living things, especially plants. Therefore, when there is enough warmth and direct sunlight, as well as water from rain, the seed splits open and germination begins. This usually occurs in spring when there is sufficient warmth and rain.⁷

← **Show image 5A-5: Close-up of germinated tree seed**



Once germination begins, the seed produces roots that search for groundwater.⁸ As they find water, the roots hold fast in the ground and a stem grows up towards the sunlight. Tiny seed leaves open and use the sun and water to make food. The seed has become a seedling, or young plant. Seedlings need just the right amount of water, warmth, and sunshine to grow. With the

- 7 This is why April (rain) showers do indeed bring May flowers!

- 8 The word *groundwater* is a compound word made of the word *ground* and the word *water*. It means water that is underground.

right conditions, seedlings develop into young trees with roots, a trunk, branches, and leaves. Young trees are called saplings.



← **Show image 5A-6: Tree sapling**

9 When something is flexible, it means it can bend or move quite easily. Stand up and bend to touch your toes to see how flexible you are.

Tree saplings are much smaller than **mature** trees, or adult trees. Usually, trees are called saplings when they are between three and fifteen years of age. A tree sapling's bark is smooth, and its trunk is **flexible**—meaning it can bend more easily than a mature tree can.⁹ Once a tree is considered mature, it may flower and produce fruits, nuts, or cones. Some trees simply produce seeds.



← **Show image 5A-7: Deciduous and evergreen trees**

10 What are some names of deciduous trees? (maple, oak, birch, etc.)

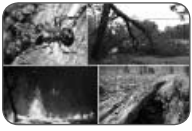
There are two types of trees: deciduous and evergreen. Deciduous trees shed their leaves.¹⁰ Deciduous trees tend to have wide, flat leaves, whereas evergreen tree leaves tend to be narrow and thin like needles. During the cold winter months, deciduous trees shed their leaves and become inactive for the winter, much like hibernating animals do during the wintertime. In fact, this is what keeps them alive during the coldest part of the year.

To prepare for this time of rest, deciduous trees stop using their leaves to make food, and instead they shed these leaves. Then, during the cold winter months, they save their energy until spring returns. In the spring, they will use their energy to produce new leaves.

11 What are some names of evergreen trees? (spruce, pine, fir, etc.)

Evergreen trees, on the other hand, shed and reproduce their leaves throughout the year, so there are always green leaves on evergreen trees all year long.¹¹ The cones of evergreen trees are its flowers. Unlike deciduous trees, evergreen trees do not shed all of their leaves at the end of fall. Instead, they use their leaves to make food all winter.

How long does it take for a tree to grow to its full size? Well, this depends on a number of things. Different kinds of trees grow at different speeds. In tropical parts of the world, where there is constant intense sunshine and rainfall, a tree can reach maturity, or become an adult, in thirty years. In colder regions of the world it can take a hundred years or more.



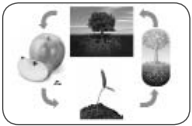
← **Show image 5A-8: Tree destruction**

The length of a tree's life depends on many things. It will always depend on the tree having enough sunshine and water, but other factors can affect its growth and lifespan, too. The condition of the soil in which the tree is growing, and diseases such as insect infestations and bacteria, can alter the natural lifespan of a tree.¹² Accidents such as fires and natural disasters such as hurricanes and floods can have an effect too. Also, people cut trees down so that they can be used to make a variety of products.

12 An infestation occurs when a large number of something harmful enters an area.

When a tree lives for a long time and then dies, it is not totally at the end of its journey. **Decomposers**, like earthworms, bacteria, and fungi, take over the dead tree.¹³ Through the decomposition process, they help to slowly break down the tree into a rich nutrient that feeds the soil and enables new tree seeds to grow.

13 Fungi are living things such as molds, mushrooms, and yeasts that live on dead or decaying things.



← **Show image 5A-9: Life Cycle of an Apple Tree**

And there you have it, the life cycle of a tree.

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 tree.)
2. *Literal* What are several things that make trees an important part of life on earth? (Trees provide us with oxygen; trees help to clean up the soil by absorbing or changing harmful chemicals; trees take in carbon dioxide and therefore help to manage Earth's climate; trees help to fight soil erosion; trees are used in the manufacture of many things; etc.)

3. *Literal* What are the stages of a tree's life cycle? (The stages of a tree's life cycle are seed, germination, sapling, and adult.) With what does a tree's life cycle begin? (A tree's life cycle begins with a seed.)
4. *Literal* When does a tree's seed germinate or sprout? (A tree's seed germinates during the spring when the temperatures are warmer and the amount of daylight is greater.)
5. *Literal* When does a tree begin to produce flowers and fruits? (A tree begins to produce flowers and fruits when it has reached maturity or the adult stage.)
6. *Evaluative* What is the difference between deciduous trees and evergreen trees? (The leaves of deciduous trees change color and fall off in the autumn. Evergreen trees shed and make new leaves all the time.)
7. *Literal* What are the different ways that seeds are dispersed or spread apart that help ensure that a tree's life cycle repeats every year? (The tree's seeds are scattered away from the parent tree by animals, people, wind, and water.)

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

I am going to ask a question. I will give you a minute to think about the question, and then I will ask you to turn to your neighbor and discuss the question. Finally, I will call on several of you to share what you discussed with your partner.

8. *Evaluative Think Pair Share:* Would it be easier for you to observe the complete life cycle of a sunflower plant or a tree? Why? (It would be easier to observe the shorter life cycle of a sunflower plant; many trees have a longer life cycle than people.)
9. 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: Dependent

5 minutes

1. In the read-aloud you heard, “The air that [we] breathe is totally *dependent* on the existence of trees.”
2. Say the word *dependent* with me.
3. To be dependent means to need the help and support of something or someone else.
4. Having enough oxygen to breathe is dependent on having enough trees to create the oxygen.

Young children are dependent on their parents.

5. Are you dependent on something or someone? Tell your partner about who or what you are dependent on.

[Ask two or three students. If necessary, guide and/or rephrase the students’ responses: “I am dependent on _____.”]

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 pairs. If what I say first is dependent on what I say second, say, “[First item] is dependent on [second item].” If what I say first is not dependent on what I say second, say, “[First item] is not dependent on [second item].”

1. baby/mother (A baby is dependent on his mother.)
2. number of days in a year/number of sunny days (The number of days in a year is not dependent on the number of sunny days.)
3. change in seasons/Earth’s orbit and tilt (Change in seasons is dependent on Earth’s orbit and tilt.)
4. having enough oxygen/trees (Having enough oxygen is dependent on trees.)
5. growth of a plant/ sunshine and water (The growth of a plant is dependent on sunshine and water.)
6. germination/pollinators (Germination is not dependent on pollinators.)



Complete Remainder of the Lesson Later in the Day



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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

10 Sequencing the Life Cycle of a Tree (Instructional Masters 5B-1 and 5B-2)

15 minutes

- Tell students that an example of a flowering tree is the apple tree. Show students Cycles Poster 3 (Life Cycle of a Tree), and have them identify each stage of the apple tree's life cycle. (apple seed, germination and seedling, sapling, mature tree with apples)
- Give students Instructional Masters 5B-1 and 5B-2. Tell them that they will create Response Card 4; it will show the life cycle of a tree. [**Note:** This Response Card should be held and viewed using landscape orientation.]
 - First, have students cut out the images of the stages of the life cycle of an apple tree on Instructional Master 5B-1.
 - Next, have them put the images in the correct order of the life cycle of the apple tree.
 - Then, students should glue or tape the images in the correct blanks on Instructional Master 5B-2.
 - Finally, have students describe the life cycle of an apple tree to their partner or home-language peers.

Domain-Related Trade Book

20 minutes

- Refer to the list of recommended trade books in the Introduction at the front of this *Supplemental Guide*, and choose one trade book about the life cycle of a tree to read aloud to the class.

- Explain to students that the person who wrote the book is called the author. Tell students the name of the author. Explain to students that the person who makes the pictures for the book is called an illustrator. Tell students the name of the illustrator. Show students where they can find this information on the cover of the book or on the title page.
- As you read, use the same strategies that you have been using when reading the read-aloud selections—pause and ask occasional questions; rapidly clarify critical vocabulary within the context of the read-aloud; etc.
- After you finish reading the trade book aloud, lead students in a discussion as to how the story or information in this book relates to the read-alouds in this domain.