

Basic Level



Life Science

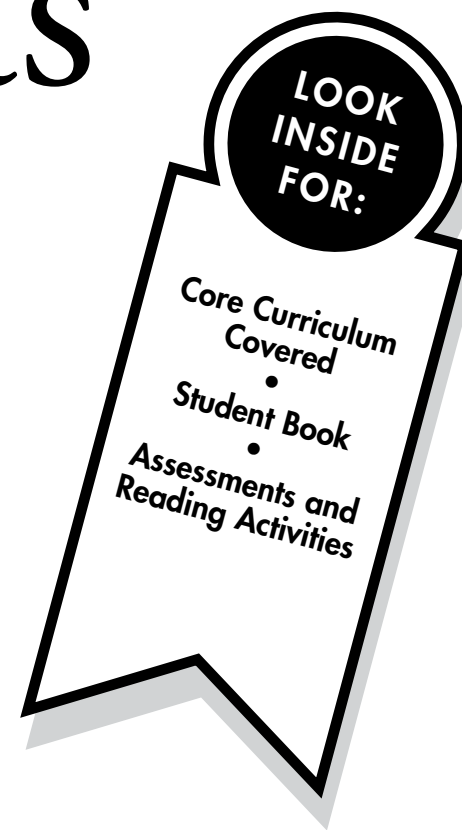
Plant and Animal Adaptation

How Plants Survive

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How Plants Survive

How are plants well-suited to live in their environments?

CORE CURRICULUM STATEMENTS

Individual organisms and species change over time.

Each plant has different structures that serve different functions in growth, survival, and reproduction.

- roots help support the plant and take in water and nutrients
- leaves help plants utilize sunlight to make food for the plant
- stems, stalks, trunks, and other similar structures provide support for the plant
- some plants have flowers
- flowers are reproductive structures of plants that produce fruit which contains seeds
- seeds contain stored food that aids in germination and the growth of young plants

In order to survive in their environment, plants and animals must be adapted to that environment.

- seeds disperse by a plant's own mechanism and/or in a variety of ways that can include wind, water, and animals
- leaf, flower, stem, and root adaptations may include variations in size, shape, thickness, color, smell, and texture
- animal adaptations include coloration for warning or attraction, camouflage, defense mechanisms, movement, hibernation, and migration

Organisms maintain a dynamic equilibrium that sustains life.

Plants respond to changes in their environment. For example, the leaves of some green plants change position as the direction of light changes; the parts of some plants undergo seasonal changes that enable the plant to grow; seeds germinate, and leaves form and grow.

Plants and animals depend on each other and their physical environment.

When the environment changes, some plants and animals survive and reproduce, and others die or move to new locations.

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Student Book

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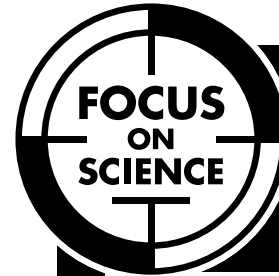
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by Stan Hall





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Table of Contents

Introduction:

What Do Plants Need? 4

Chapter 1:

Structures for Survival.....6

Roots7

Stems, Stalks, and Trunks ..10

Leaves12

Flowers and Seeds.....14

Chapter 2:

Adapting to Survive16

Glossary22

To Find Out More.....23

Index.....24

– Predict –

*What do you think you will
learn from reading this book?*

INTRODUCTION

What Do Plants Need?

Plants are everywhere! Many types of plants can be found in New York. You will find trees and bushes. These are plants. Grass is a plant. Flowers are plants. Fruits and vegetables are plants.

Plants need food, water, air, and light to survive. We need plants to **survive**.

Plants have special **structures** that help them meet their needs. These include roots, stems, leaves, and seeds.

– Connect –

What types of plants live near your home?

survive: to remain alive
structure: a part of an organism

Plants can also change to get what they need. Plants have been growing for millions of years. They have **adapted** to survive for all that time.

In this book, you will find out what helps plants survive.



*Plants have the same basic needs as you—
food, water, air, and space.*

adapt: to change to fit a new situation

CHAPTER 1

Structures for Survival

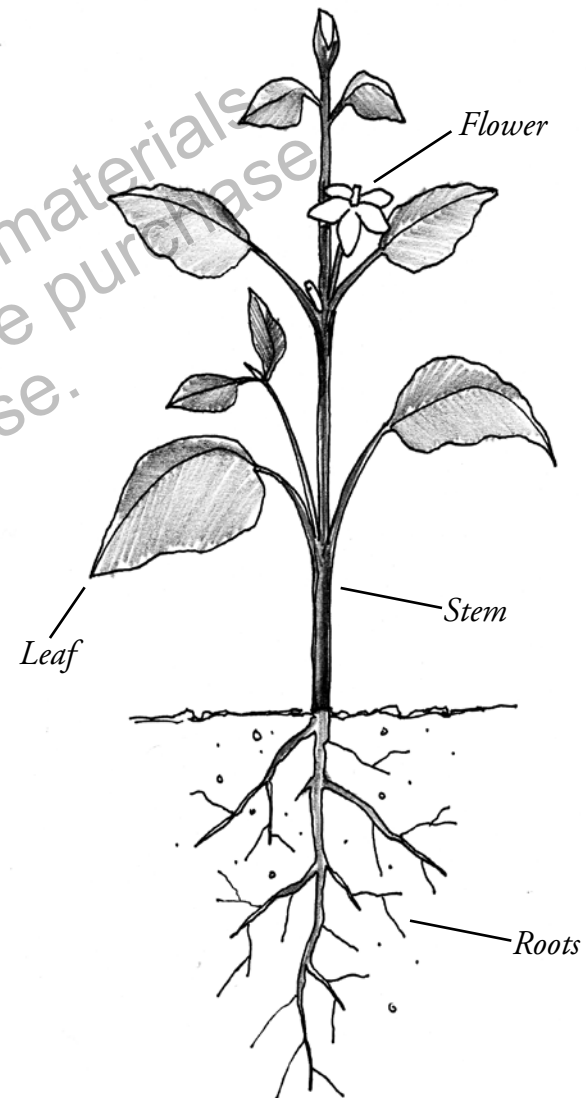
In this chapter, you will learn about the structures of a plant. Each structure helps the plant survive.

Structure	Function
Roots	<ul style="list-style-type: none">• Holds plants in place• Takes nutrients from soil and water
Stems, Stalks, and Trunks	<ul style="list-style-type: none">• Carries nutrients and water to other parts of plants• Support other parts of plants
Leaves	<ul style="list-style-type: none">• Takes energy from sunlight to make food for plants
Flowers and Seeds	<ul style="list-style-type: none">• Makes new plants through reproduction

– Connect –

What are some body structures that help you survive?

Structures of Plants



Roots

Roots are structures that grow into the soil. They hold the plant in place. Roots also suck up nutrients and water from the soil to feed the plant.

The size of the roots can depend on where the plant lives. For example, a desert is a hot, dry place. There is little water near the surface of the soil. Plants in the desert have to go deep in the ground to find water.

Survivor Plant: Acacia Tree

Workers were digging a well in the Kalahari Desert in Africa. They found that roots of an Acacia tree measured up to 220 feet deep in the ground. That is as tall as an 18-story building!



Many roots can be eaten. Some of the vegetables you eat are roots. These include carrots, radishes, and sweet potatoes.

– Connect –
What kinds of roots do you like to eat?

Stems, Stalks, and Trunks

Tomato plants have stems. Corn plants have stalks. Trees have trunks.

Stems, stalks, and trunks all do the same things. They carry nutrients, water, and food throughout the plant.

Survivor Plant: Baobab Tree

These huge trees live on dry, hot grasslands in Africa. Baobab trees have thick trunks that can store thousands of gallons of water. Baobab trees can live for more than 1,000 years.



Stems, stalks, and trunks also hold other parts of the plant. They hold leaves, flowers, and seeds.

Some of the foods you eat are stems or stalks. These include asparagus, rhubarb, radish, and sugar cane.

Survivor Plant: Saguaro Cactus

The long arms of a giant saguaro cactus are stems. The desert has very little rain, so the saguaro's stems store every drop of water it can get.



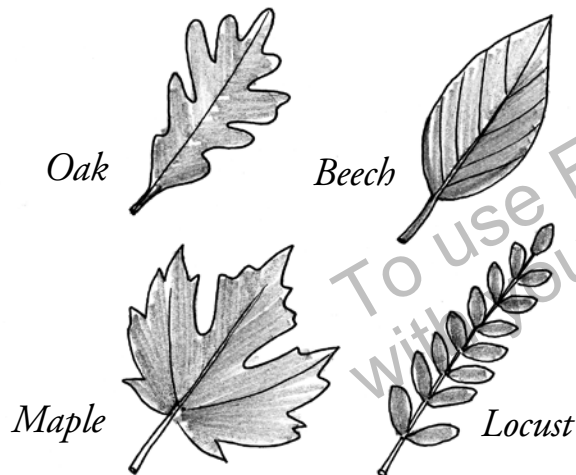
– Connect –

How do your eyes and ears help you survive?

Leaves

Most plants make their own food. They need leaves to do this. Leaves take energy from sunlight. This energy helps make food for the plant.

Leaves have many different shapes and sizes. Here are examples of just a few types of leaves.

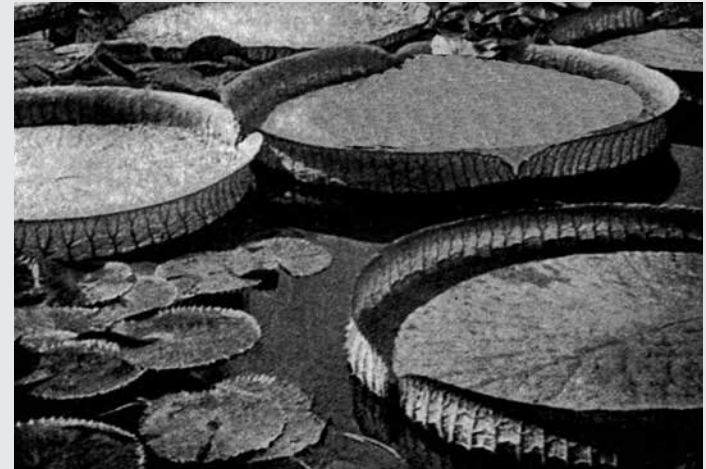


– Distinguish –
Describe how some leaves look different from others.

Leaves are a big part of what people and animals eat. Nearly 1,000 types of plants have leaves that you can eat. Lettuce and spinach are two examples.

Survivor Plant: Amazon Water Lily

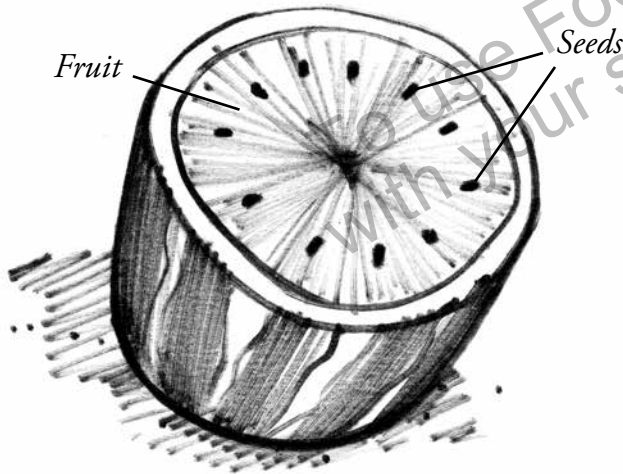
The Amazon water lily of South America is the largest of all known water plants. The water lily's leaves are up to seven feet wide! The leaves' huge size allows the rest of the plant, which is under the water, to take in more sunlight in order to survive.



Flowers and Seeds

Some plants have flowers. Flowers have many different sizes, shapes, colors, and smells. Flowers are the **reproductive** structures of plants. They produce fruit. Fruit contains seeds.

A watermelon starts as a flower on a plant. It grows into a fruit. Inside the fruit are seeds. The fruit gives the seeds the food they need to grow. Then the seeds can become new plants.



reproductive: produces another plant of the same kind

Seeds sometimes travel to help plants survive. Animals help. They carry seeds to other places. For example, a squirrel can carry a nut to a new place. That nut can grow into a new tree.

Seeds can move in other ways. They drop off the plant. They can then be carried by wind or water.

– Predict –

*What might happen to a sunflower seed
blown by the wind to a meadow?*

Adapting to Survive

Plants change as their environment changes. They must adapt to survive.

For example, leaves get energy from sunlight. When Earth turns, the sun is in a different part of the sky. The leaves of some green plants turn toward the sun to get more light.

Survivor Plant: Giant Groundsel

The weather is extremely cold at night on top of Africa's Mount Kenya. The giant groundsel plants that grow there unfold thick leaves during the day to take in sunlight. The plants fold in the leaves at night to stay warm and survive.



Some plants adapt to the change of seasons. You see this in New York.

Think about the fall. The air gets cooler. The hours of daylight get shorter. Trees adapt to these changes.

The leaves on some trees turn colors. They fall to the ground. Their seeds also fall. The tree knows winter is coming. It is adapting to the change.

In spring, the trees bloom with flowers. Leaves appear. They start making food for the trees. Seeds dropped in fall begin to grow new trees.

In the hot summer, leaves are green. Young plants grow. Then fall comes again. What happens next?

Plants also adapt to changes in weather. For example, some plants have adapted to droughts. These are periods with very little rain. The wild blackberry bushes have adapted to survive long periods with no rain.

Survivor Plant: Resurrection Fern

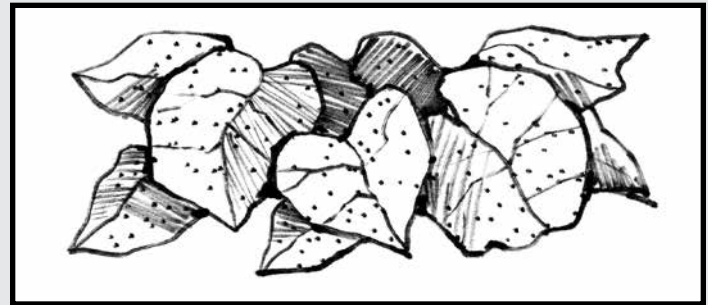
No rain is no problem for the resurrection fern. This plant lives by attaching itself to a large tree. It lives off the nutrients in tree bark and from the air. In dry seasons, the fronds (leaves) of the fern turn brown and shrivel up. The plant looks dead, but it is alive. All it takes is one rain shower for the fronds to uncurl and turn green again.



Another way plants adapt to weather is by moving. Scientists have found that some plants have moved away from warmer places lower on a mountain. They now grow at a cooler place up higher.

Survivor Plant: Lichen

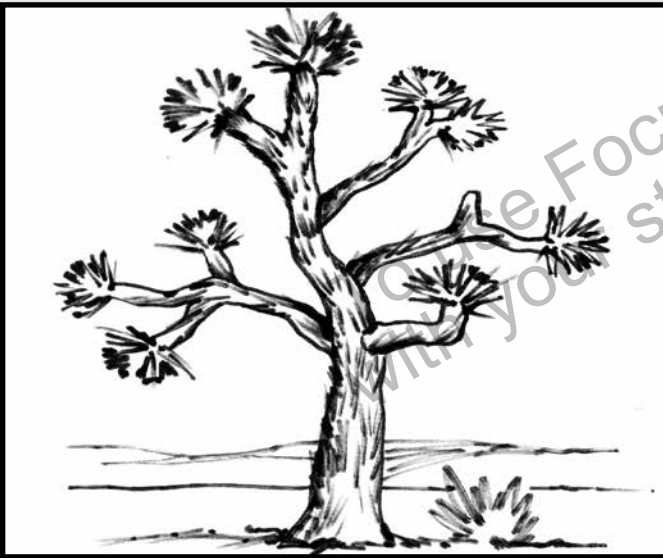
More than 150 lichens live in Antarctica, the world's coldest place. A lichen is a small plant made of algae and fungus. Lichens survive and reproduce in freezing weather because they have adapted to the cold. They also grow low to the ground for protection from high winds.



There are many different types of plants in different parts of the world. This is because plants have adapted to place they live in to survive.

Survivor Plant: Joshua Tree

Desert plants like the Joshua tree have adapted to very high temperatures and little rain. The Joshua tree grows mainly in California.



– Predict –

What might happen if a Joshua tree was planted in the rain forest?

Why Plants Survive

Plants survive for many reasons. The sun provides them with energy to make food. They have special structures. These structures give support. They provide water and food. They help the plant reproduce. Plants also survive by adapting to changes.

We depend on plants to live. The fruits and vegetables people eat are parts of plants. When plants survive, we survive, too.

– Evaluate –

Imagine that all food crops have died. Why couldn't humans survive just by eating meat?

Glossary

adapt—to change to fit into a new situation

reproductive—produces another plant of the same kind

structure—a part of an organism

survive—to remain alive

To Find Out More . . .

Want to learn more about plants?

Try these books

Amazing Plants by Honor Head. Gareth Stevens Publishing, 2007.

A Walk in the Deciduous Forest by Rebecca L. Johnson. Carolrhoda Books, 2001.

Meat-Eating Plants and Other Extreme Plant Life by June Preszler. Capstone Press, 2010.

Plants: Flowering Plants, Ferns, Mosses, and Other Plants by Shar Levine. Crabtree Publishing Company, 2010.

Access these Web sites

Biology4Kids

http://biology4kids.com/files/plants_main.html

neoK12

www.neok12.com/Plants.htm

Plants for Kids

www.kathimitchell.com/plants.html

Index

basic needs, 4

deciduous trees, 17

drought, 18

flowers, 6, 14, 16

leaves, 6, 12–13, 16–17

rain forest, 9

roots, 6–9

seeds, 6, 14–15

stalks, 6, 10–11

stems, 6, 10–11, 16

trunks, 6, 10

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Assessments

How Plants Survive

Print pages 20–22 of this PDF for the assessments.

Check Understanding

Shade the circle next to the correct answer.

1. Where do leaves get energy to make food for the plant?

- Ⓐ stems
- Ⓑ sunlight
- Ⓒ soil
- Ⓓ flowers

2. Which structure allows a plant to reproduce?

- Ⓐ stems
- Ⓑ roots
- Ⓒ leaves
- Ⓓ flowers

3. What do plants need in order to survive?

- Ⓐ food, water, air, and light
- Ⓑ water, air, light, and shelter
- Ⓒ food, air, shelter, and soil
- Ⓓ light, food, shelter, and soil

4. The picture below shows a tree branch.



This picture shows a branch during which season?

- Ⓐ autumn
- Ⓑ winter
- Ⓒ spring
- Ⓓ summer

Check Understanding

Shade the circle next to the correct answer or write your answers on the lines provided.

Note that question 5 has only three choices.

5. Animals help plants reproduce by

- Ⓐ carrying seeds
- Ⓑ giving them food
- Ⓒ adapting to changes

6. Identify **one** example of a leaf that people eat.

7. The picture below shows a Baobab tree.



Which structure allows the Baobab tree to store a large amount of water?

- Ⓐ roots
- Ⓑ trunk
- Ⓒ flowers
- Ⓓ leaves

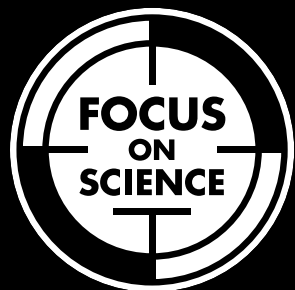
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Assessment Scoring Guidelines

1. Answer B is correct.
2. Answer D is correct.
3. Answer A is correct.
4. Answer B is correct.
5. Answer A is correct.
6. Lettuce, spinach
7. Answer B is correct.

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English Language Arts Activities

How Plants Survive

Print pages 24–28 of this PDF for the reading activities.

Compound Words

TRY THE SKILL

Compound words are made by joining two short words. The two short words do not always have the same meaning when they are part of a compound word. Still, understanding the two short words will help you figure out the meaning of the longer word.

For example, *blackberry* is a compound word. *Black* means “very dark in color” or “reflecting little or no light.” *Berry* means “a pulpy fruit of small size.” A blackberry is a small pulpy fruit that is dark in color.

Read the definition. Then choose the compound word that fits the definition.

1. A word that means the same as sundown

- Ⓐ sunset
- Ⓑ sunflower
- Ⓒ sunrise
- Ⓓ sunlight

2. A large fruit that is made mostly of water

- Ⓐ watercolor
- Ⓑ waterfall
- Ⓒ watermelon
- Ⓓ waterfront

3. To pull a plant out of the ground

- Ⓐ upstart
- Ⓑ upwind
- Ⓒ upright
- Ⓓ uproot

4. An insect that jumps through the grass

- Ⓐ grasslands
- Ⓑ grasshopper
- Ⓒ grassroots
- Ⓓ bluegrass

Contractions and Abbreviations

TRY THE SKILL

A contraction is two words written as one. An apostrophe shows that one or more letters have been left out. You might have seen these contractions in your reading.

did not — didn't	they are — they're
could not — couldn't	we are — we're
he is — he's	she had — she'd
what is — what's	I had — I'd
we will — we'll	I am — I'm

An abbreviation is a short way to write a word or a phrase. Abbreviations often, but not always, end with periods. Here are the abbreviations for months.

January — Jan.	August — Aug.
February — Feb.	September — Sept.
March — Mar.	October — Oct.
April — Apr.	November — Nov.
July — Jul.	December — Dec.

Read each phrase or sentence. Underline any contraction or abbreviation you find. Then write the word or phrase that means the same.

1. Oct. 18 _____

2. Jan. 1 _____

3. Apr. 7 _____

4. Aug. 30 _____

5. They're going to pick strawberries.

6. The corn crop didn't survive the hot summer.

7. We're ready for spring weather.

Identify a Purpose

TRY THE SKILL

Knowing why something was written can help you understand it. These are the main reasons why an author writes:

- to give readers information
- to tell readers how to do something
- to persuade readers to think or act in a certain way
- to entertain readers

What is the main purpose of this book?

This book was written to give you information. It tells about the different structures of plants. You are not expected to learn how to do something. You are not persuaded to think or act in a certain way. So the main purpose of this book was to inform.

Read the description of each selection. Then identify its main purpose.

1. This selection tells how plants adapt to cold weather.

- Ⓐ to inform
- Ⓑ to instruct
- Ⓒ to persuade
- Ⓓ to entertain

2. This selection tells how to build a treehouse.

- Ⓐ to inform
- Ⓑ to instruct
- Ⓒ to persuade
- Ⓓ to entertain

3. This selection tells why people should eat more vegetables and fruit.

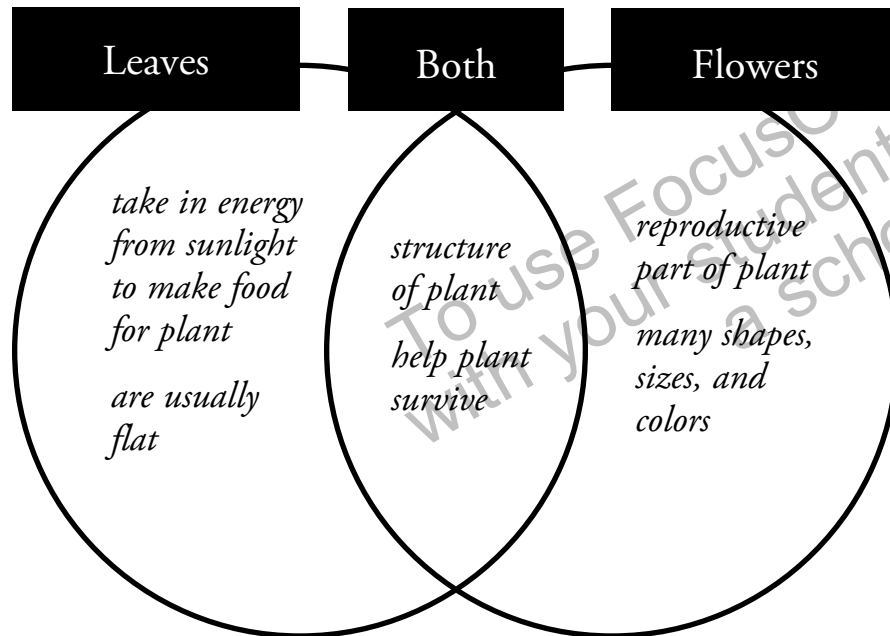
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Compare and Contrast

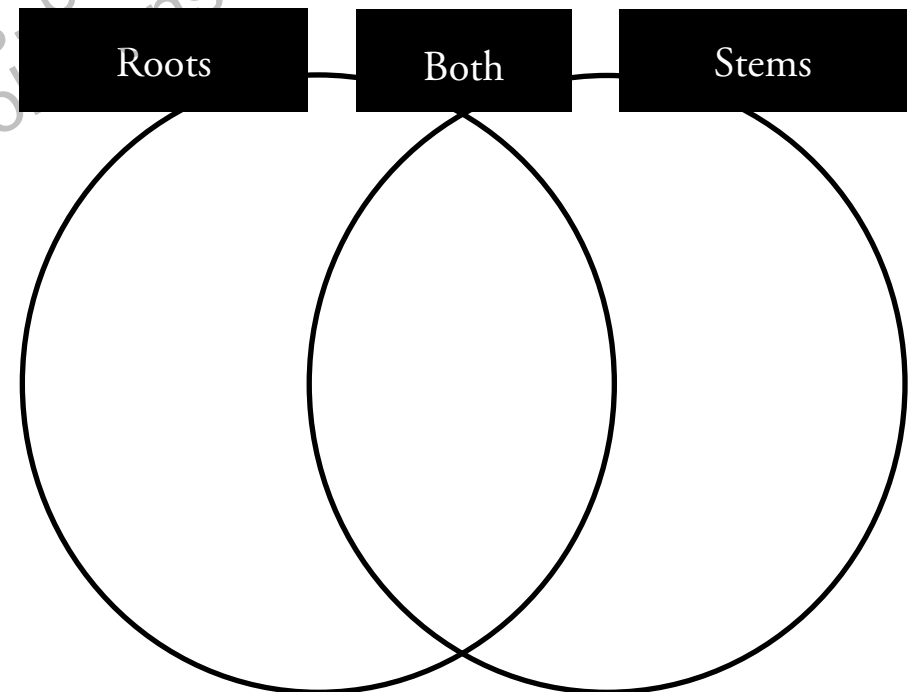
TRY THE SKILL

When you compare two things, you tell how they are alike. When you contrast them, you tell how they are different. A Venn diagram is made of overlapping circles. It can help you compare and contrast. This Venn diagram contrasts leaves and flowers.

Read the phrases in the box. Use this Venn diagram to contrast roots and stems.



support plant • push down into soil • structure of plant
carry water to rest of plant • help plant survive
suck nutrients from soil • similar to stalks and trunks



Answer Key

Compound Words

1. A
2. C
3. D
4. B

Contractions and Abbreviations

1. October
2. January
3. April
4. August
5. They are
6. Did not
7. We are

Identify a Purpose

1. A
2. B
3. C

Compare and Contrast

Roots: push down into soil, suck nutrients from soil

Both: support plant, structure of plant, help plant survive

Stems: carry water to rest of plant, similar to stalks and trunks