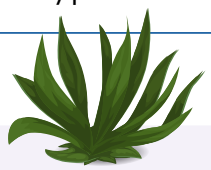
EDUCATE STATION

FIFTH GRADE SCIENCE

PLANTS

In this learning plan, students will learn how to identify the parts of a plant. First, students will learn about the functions of the roots and stems of a plant. Then, they will take part in activities to learn photosynthesis. Students will also learn the different parts of a flower and their functions and identify different types of fruit.



STANDARDS

NGSS 5-LS2-1
support an argument that plants get the materials they need for growth chiefly from air and water.

OBJECTIVES

- ✓ Students will be able to define what a plant is and identify the parts of a plant.
- ✓ Students will be able to recognize the different types of plants and their characteristics.
- ✓ Students will be able to understand the importance of pollination in the plant life cycle.
- ✓ Students will be able to explain the process of photosynthesis.

GUIDING QUESTIONS

What are the different parts of a plant and their functions?

How do plants reproduce and grow?

What is photosynthesis?

How does photosynthesis contribute to the movement of matter in ecosystems?

How do plants make their own food?

ASSESSMENTS

Formative assessments and checks for understanding occur throughout the lesson:

- Students will be assessed based on their participation in group activities and class discussions.

Summative Assessment:
Flowers and Fruits

MATERIALS

- ☐ Plant Identification Guide worksheet
- ☐ Introduction to Plants worksheet
- ☐ Leaves and Photosynthesis worksheet
- ☐ Life Cycle of a Plant worksheet
- ☐ Flowers and Fruits worksheet
- ☐ Pictures or diagrams of plant life cycle stages
- ☐ Whiteboard or chart paper
- ☐ Pictures of different types of plants (flowers, trees, ferns, leaves, stems, roots etc.)
- ☐ Magnifying glasses
- ☐ Crayons
- ☐ Pictures of different types of plants with their roots
- ☐ Large carrots and potatoes
- ☐ Fresh leaves (e.g., spinach, lettuce, ivy)
- ☐ Clear plastic cups
- ☐ Water
- ☐ Sunlight or a bright light source
- ☐ Scissors, tape, and paper
- ☐ Different types of fruits

DIFFERENTIATION STRATEGIES

- Preview vocabulary terms ahead of time and read materials aloud to support students.
- Allow students to work with partners and provide them with images and models.
- Provide students with graphic organizers to support their understanding.

EXTENSION ACTIVITIES

- Have students make a mini greenhouse and observe the process of photosynthesis.
- Have students plant a root vegetable, such as carrots or potatoes.
- Real-life application: Have students research and describe a real-life application of photosynthesis (e.g., how photosynthesis is used in agriculture, the production of oxygen, etc.)

ACTIVITY OVERVIEW

Activity 1	Activity 2	Activity 3	Activity 4	Activity 5
Introduction to Plants Students will be able to identify and describe the parts of a plant.	Plant Life Cycle Students will be able to identify and describe the different stages in a plant's life cycle.	Roots and Stems Students will be able to identify the different parts of a root and stem and their functions.	Leaves and Photosynthesis Students will be able to explain the process of photosynthesis.	Flowers and Fruits Students will be able to identify the different parts of a flower and their functions.

ACTIVITY 1: INTRODUCTION TO PLANTS

- Begin the lesson by asking the students what they know about plants. Then, write their responses on the whiteboard or chart paper.
- Tell the students that in this lesson, they will learn about the different types of plants, their characteristics, and their importance to us.
    - Define plants: a living organism that produces its food through photosynthesis and has specialized structures such as roots, stems, leaves, and flowers.
- Show pictures of different plants and ask the students to identify them.
- Using the Plant Identification Guide worksheet, identify the parts of each plant specimen and write them on the whiteboard.
- Explain the different types of plants (e.g., flowering plants, non-flowering plants, trees, ferns, etc.) and their characteristics (e.g., size, color, shape, etc.). Show the pictures of different types of plants and ask the students to identify them.
- Write the characteristics of each type of plant on the whiteboard and discuss the importance of plants in our lives (e.g., food, oxygen, medicine, clothing, etc.). Ask students to name some plants they know that are used for food, medicine, or other purposes. Write their responses on the whiteboard.
- Divide the class into small groups. Give each group a live plant specimen and ask them to identify the parts of the plant using their plant identification guides.
- Summarize the main points of the lesson. Then, ask the students if they have any questions or comments. Distribute the Introduction to Plants worksheet for students to complete.

ACTIVITY 2: PLANT LIFE CYCLE

- Begin the lesson by asking students if they have ever seen a plant grow from seed. Then, ask them to describe what they observed and how the plant changed over time.
- Introduce the concept of a plant life cycle by explaining that plants, like animals, have a specific process of growth and development.
- Ask students to brainstorm what they already know about the different stages of a plant's life cycle.
- Using pictures or diagrams, review the four stages of the plant life cycle: seed, germination, growth, and reproduction. Discuss each stage in detail and have students identify the parts of the plant involved in each stage.
- Using real or plastic plant specimens, have students observe the different parts of a plant involved in reproduction, such as the flower, pollen, and seeds.
- Draw a diagram of the plant life cycle on the board or chart paper and have students label and describe each stage.
- Discuss the importance of pollination in the plant life cycle and how plants rely on bees, butterflies, and other insects for pollination.
    - Read a book about plants such as: 13 Ways to Eat a Fly by Sue Heavenrich; Animal Pollinators by Jennifer Boothroyd; or The Clover & the Bee; A Book of Pollination by Anne Ophelia Dowden.
- Review the four stages of the plant life cycle, and ask students to share what they learned.
- Encourage students to observe plants in their environment and look for evidence of the plant life cycle stages.
- Distribute the Life Cycle of a Plant worksheet for students to complete independently.

ACTIVITY 3: ROOTS AND STEMS

- Begin by reviewing the different parts of a plant.
- Explain that today's lesson will focus on the roots and stem of a plant.
- Explain that the roots anchor the plant to the ground and absorb water and nutrients. Likewise, the stem supports the plant and transports water and nutrients from the roots to the leaves.
    - Read and discuss a book, such as Roots (Plant Parts) by Vijaya Khisty Bodach.
- Show students pictures of different types of plants with their roots.
- Ask the students to describe what they see. Then, write their answers on the whiteboard or chart paper.
- Explain the different types of roots (taproot or fibrous) and the different parts of the stem.
- There are two types of roots: taproots and fibrous roots. Taproots are thick and grow straight down, while fibrous roots are thin and spread out in many directions.
- Nodes are the points on the stem where leaves, branches, or flowers grow from. Internodes are the spaces between the nodes.
- Distribute a carrot and potato or an image of a carrot and potato with roots and stems to each pair or group of students.
- Have students discuss the carrot and the different parts of the root.
- Have students use magnifying glasses to observe the root hairs on the carrot.
- Discuss the importance of stems and their functions.
- Have students discuss the potato and the different parts of the stem.
- Have students use magnifying glasses to observe the eyes of the potato.
- Have the groups share their findings with the class.
- Review the different parts of a root and a stem and their functions.

ACTIVITY 4: LEAVES AND PHOTOSYNTHESIS

- Begin by discussing with the students what they already know about leaves and their importance.
    - Ask questions such as: "What are the parts of a leaf?" "What do leaves do?" "How do leaves help plants survive?"
- Provide each student with a fresh leaf and have them examine it closely.
- Ask them to describe the different parts of the leaf and to identify the veins and the stem.
- Have the students place their leaves in a clear plastic cup with a small amount of water. Make sure the stem is submerged in the water.
- Find a sunny location or bright light source and place the cups in the light.
- After a few hours, have the students check on their leaves. Ask them to describe any changes they see.
- Explain to the students that leaves are vital because they help plants make food through photosynthesis.
    - Read a book such as: Photosynthesis: The Science Behind This - Facts For Children by Bold Kids; or Understanding Photosynthesis with Max Axiom Super Scientist: 4D An Augmented Reading Science Experience by Liam O'Donnell.
- Use scissors to cut out a leaf shape from a piece of paper. Then, ask the students to draw the different parts of the leaf (veins, stem, etc.) and label them.
- Next, ask the students to draw arrows showing the path of water and carbon dioxide into the leaf and the path of oxygen and sugar out of the leaf.
- Distribute the Leaves and Photosynthesis worksheet for students to complete.

ACTIVITY 5: FLOWERS AND FRUITS

- Begin by reviewing the different parts of a plant. Introduce the topic of the lesson, which is about understanding the parts of a plant, specifically flowers and fruits.
- Show the class pictures or real examples of flowers and fruits and ask them to describe what they see.
- Explain that flowers are the reproductive part of a plant and that they come in many shapes, sizes, and colors.
    - Use a diagram and/or read a book such as: Flowers (Plant Parts) by Vijaya Khisty Bodach; or What's Inside A Flower?: And Other Questions About Science & Nature by Rachel Ignotofsky
- Point out the different parts of a flower, such as the petals, sepals, stamen, and pistil.
- Explain that the fruit is the part of the plant that contains the seeds and helps to disperse them.
- Show examples of different types of fruits and ask the class to identify them. Point out the different parts of a fruit, such as the skin, flesh, and seeds.
- Distribute the Flowers and Fruits worksheet to the students.
    - Allow students to work on the worksheet independently or in pairs.
- Give each student or pair a flower. Have students take apart the flower and label the different parts of a flower on the worksheet.
- In their pairs, have students make a fruit salad and identify the different types of fruits in it.
- Students will create a chart that shows the different types of fruits on the Flowers and Fruits worksheet.
- After the worksheet is completed, review the answers as a class. Ask the class to summarize what they have learned about flowers and fruits.
- Remind the class that flowers and fruits are important parts of a plant because they help the plant reproduce and continue to grow.

NAME _____ DATE _____

PLANT IDENTIFICATION GUIDE

Reference this guide as you learn about plants.

Flowers: Plants that produce flowers. Flowers have reproductive parts, including petals, sepals, stamens, and pistils.

Trees: Tall plants with woody stems and branches. Trees provide shade, and oxygen, and can be used for building materials.

Shrubs: Shorter plants with woody stems and branches. Shrubs are often used for landscaping and as ornamental plants.

Ferns: Plants with large, feathery leaves. Ferns reproduce using spores and are often found in shady areas.

Grasses: Plants with long, narrow leaves that grow close to the ground. Grasses are used for lawns, pastures, and in the production of grains.

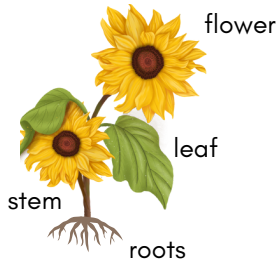
Mosses: Small, non-flowering plants that grow in moist environments. Mosses are important in soil formation and can be used for decoration.

Succulents: Plants with thick, fleshy leaves that store water. Succulents are adapted to dry environments and are often used for landscaping.

Cacti: Plants with spines instead of leaves. Cacti are adapted to dry environments and store water in their stems.

Vines: Plants that climb and attach themselves to other plants or structures. Vines can be used for decoration and in the production of fruits.

Parts of a Plant:



Flowering Plant:

Non-Flowering Plant:

NAME _____ DATE _____

INTRODUCTION TO PLANTS

Read the passage and answer the questions that follow.

A plant is: a living organism that produces its food through photosynthesis and has specialized structures such as roots, stem, leaves, and flowers.

Plants are living things that can make their own food. They are very important for us because they produce the oxygen we breathe in.

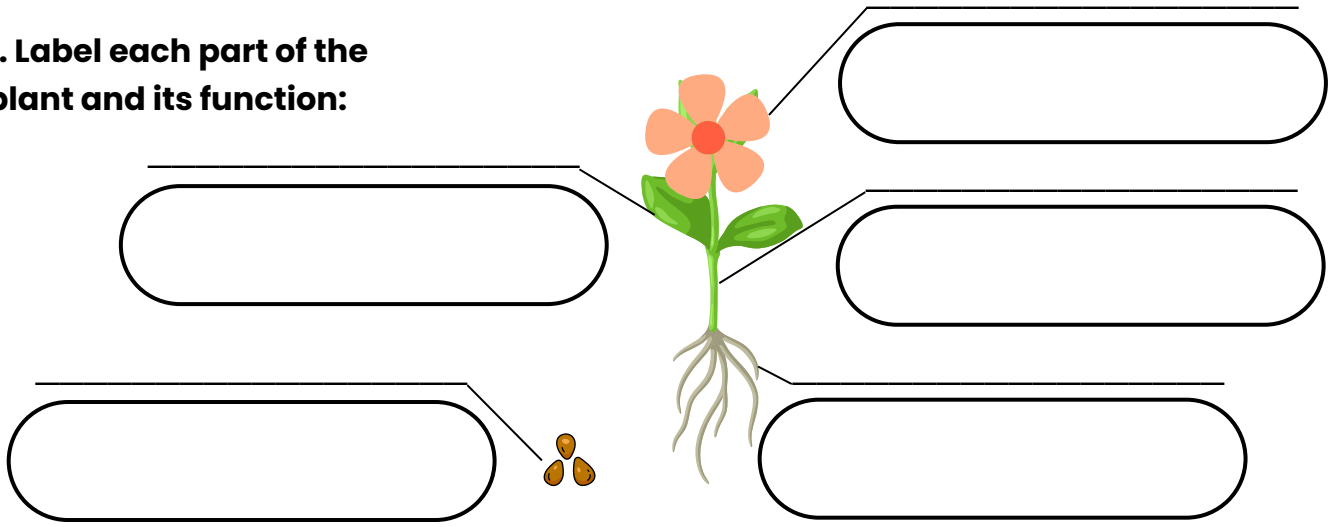
Plants have different parts like leaves, stem, and roots. Leaves make food for the plant through a process called photosynthesis. The stem holds up the plant and carries water and nutrients from the roots to the leaves. Roots absorb water and nutrients from the soil and also help to hold the plant in place.

Plants come in many different shapes and sizes. Some plants are very small, like mosses, while others are very tall, like trees. Plants can also have different colors, such as green, yellow, and red.

We use plants in many ways. We eat some plants, like vegetables and fruits, and use others to make medicine or for decoration. Plants also provide habitats for animals, and we use them to make things like paper and clothes.

So next time you see a plant, remember how important it is for us and our planet!

1. Label each part of the plant and its function:



NAME _____ DATE _____

INTRODUCTION TO PLANTS

2. Match the type of plant with its characteristics (e.g., flowering plant, non-flowering plant, tree, fern).

Tall plants with woody stems and branches
Ferns reproduce using spores and are often found in shady areas
Plants with thick, fleshy leaves that store water
Plants that climb and attach themselves to other plants or structures




3. Can you name some plants used for food, medicine, or other purposes?

_____

_____

4. Name at least two types of plants under each category.

Flowering Plant:

Non-Flowering Plant:

ANSWER KEY

NAME _____ DATE _____

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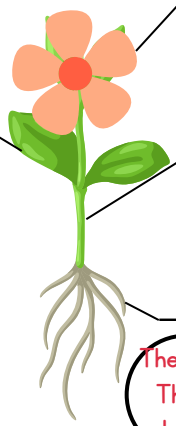

flower

Helps the plant reproduce. It produces pollen which helps fertilize other flowers, and then it develops into fruit or seeds.

leaves

Leaves are like the lungs of the plant. They use a process called photosynthesis to make food for the plant. They also help the plant breathe by taking in carbon dioxide and giving off oxygen.

stem

Backbone of the plant - It holds up the plant and helps it grow tall. The stem also carries water and nutrients from the roots to the rest of the plant.

seeds

Seeds are like baby plants. They are formed in the flower and are dispersed by wind, animals, or water. When a seed finds a good place to grow, it will sprout and start to develop into a new plant.

roots

The roots are like the feet of the plant. They anchor the plant in the soil and absorb water and nutrients from the soil. The roots also help support the stem and leaves.

ANSWER KEY

NAME _____ DATE _____

INTRODUCTION TO PLANTS

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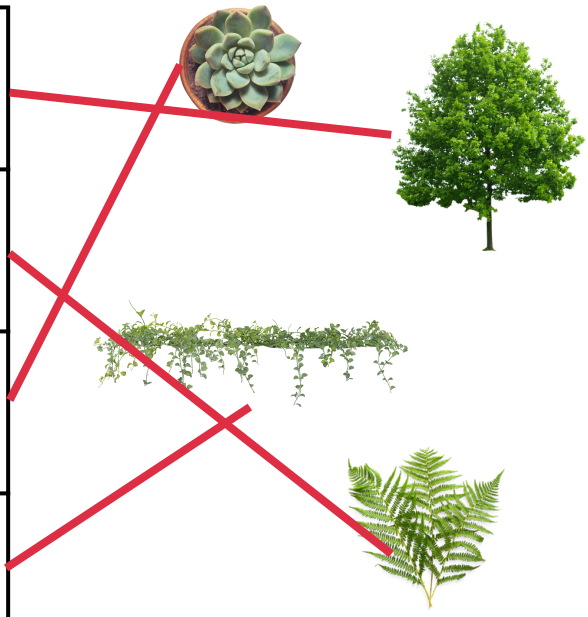


3. Can you name some plants used for food, medicine, or other purposes?

Answers will vary: corn, mustard greens, broccoli, aloe vera, peppermint

4. Name at least two types of plants under each category.

Flowering Plant:

Answers will vary: Tulip, rose, daffodil, lilacs, daisy, sunflower

Non-Flowering Plant:

Answers will vary: Ferns, mosses, conifers, ginkgo

NAME _____ DATE _____

LIFE CYCLE OF A PLANT

Read the passage and answer the questions that follow.

Plants go through a life cycle, just like people and animals do. The life cycle of a plant starts with a seed. Inside the seed, there is a tiny plant called an embryo. When the conditions are right, the seed starts to grow.

The first stage of a plant's life cycle is called germination. During germination, the seed begins to sprout and grow roots. The roots help the plant take in water and nutrients from the soil. The shoot starts to grow up towards the light.

As the plant continues to grow, it enters the second stage of its life cycle, called the vegetative stage. During this stage, the plant grows leaves and stems. The leaves are where the plant makes its food through a process called photosynthesis.

The third stage of a plant's life cycle is called reproduction. During this stage, the plant produces flowers. The flowers are where the plant makes seeds. Pollination occurs when the pollen from one flower is transferred to another flower. This is how plants reproduce.

Finally, the plant enters the fourth stage of its life cycle, which is seed production. The plant produces seeds that will grow into new plants. The seeds can be spread by the wind, water, animals, or people.

And so, the life cycle of a plant continues, from seed to seed, in an endless cycle of growth, reproduction, and renewal.

1. Draw and label the stages of a plant's life cycle.

NAME _____ DATE _____

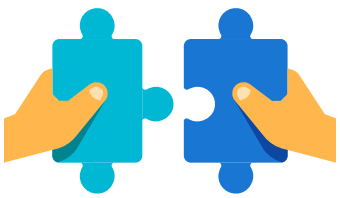
LIFE CYCLE OF A PLANT

2. Write a paragraph describing the importance of pollination in the plant life cycle.

3. Match the vocabulary words to their definitions:

seed
germination
growth
reproduction
pollination

process by which plants produce new plants of the same kind
transfer of pollen from the male part of a flower to the female part of a flower
process by which a plant increases in size and develops new parts, such as leaves, stems, and flowers
process by which a seed starts to grow into a new plant
small, hard object that contains a tiny plant inside; come in different shapes, sizes, and colors



ANSWER KEY

NAME _____ DATE _____

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1. Draw and label the stages of a plant's life cycle.

Answers will vary. Cycle should include: seed, germination, seedling, adult plant, May include: pollination/flower, fruit with seeds.

ANSWER KEY

NAME _____ DATE _____

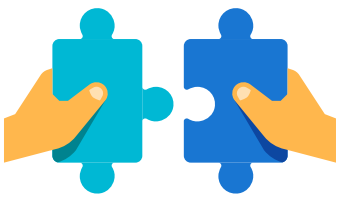
LIFE CYCLE OF A PLANT

2. Write a paragraph describing the importance of pollination in the plant life cycle.

Answers will vary. Should discuss: Pollination is used to produce fruit and seeds. Plants cannot reproduce without pollination.

3. Match the vocabulary words to their definitions:

seed	process by which plants produce new plants of the same kind
germination	transfer of pollen from the male part of a flower to the female part of a flower
growth	process by which a plant increases in size and develops new parts, such as leaves, stems, and flowers
reproduction	process by which a seed starts to grow into a new plant
pollination	small, hard object that contains a tiny plant inside; come in different shapes, sizes, and colors



NAME _____ DATE _____

LEAVES AND PHOTOSYNTHESIS

Read the passage and answer the questions that follow.

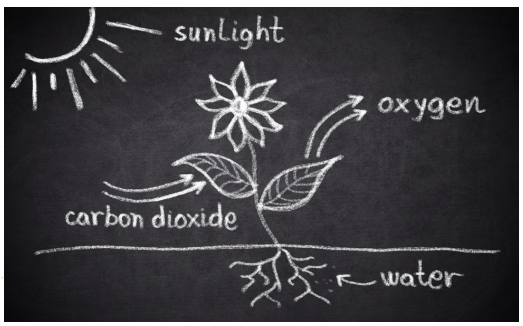
Plants are amazing living things that use photosynthesis to create their food. Leaves are a very important part of this process.

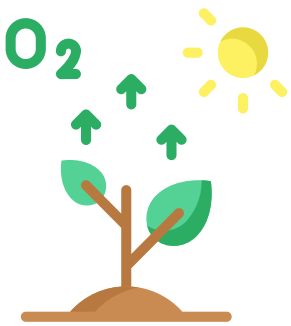
A leaf is made up of different parts. The flat, green part is called the blade. It is attached to the stem by a thin stalk called the petiole. Inside the leaf are tiny veins that carry water and nutrients from the roots to the rest of the plant. The stomata, which are small openings on the underside of the leaf, allow the plant to breathe by taking in carbon dioxide and releasing oxygen. Finally, there is the waxy cuticle on the leaf's outer surface, which helps prevent water loss.

Leaves are usually green in color because they contain a pigment called chlorophyll. Chlorophyll is what helps the plant to absorb light energy from the sun. The leaves take in carbon dioxide (CO_2) from the air and water (H_2O) from the soil through tiny pores on their surface called stomata. These raw materials then combine in the leaf to make food for the plant.

During photosynthesis, the chlorophyll in the leaves helps to convert the light energy into chemical energy. This energy is then used to turn carbon dioxide and water into glucose, a type of sugar that the plant uses as food. Oxygen gas (O_2) is also released into the air as a waste product of photosynthesis.

Photosynthesis is a vital process not only for plants but also for us. Through photosynthesis, plants produce the oxygen that we breathe, and they help to reduce the amount of carbon dioxide in the air. That is why it is important to take care of our plants and ensure they have enough water and sunlight to grow healthy and strong.

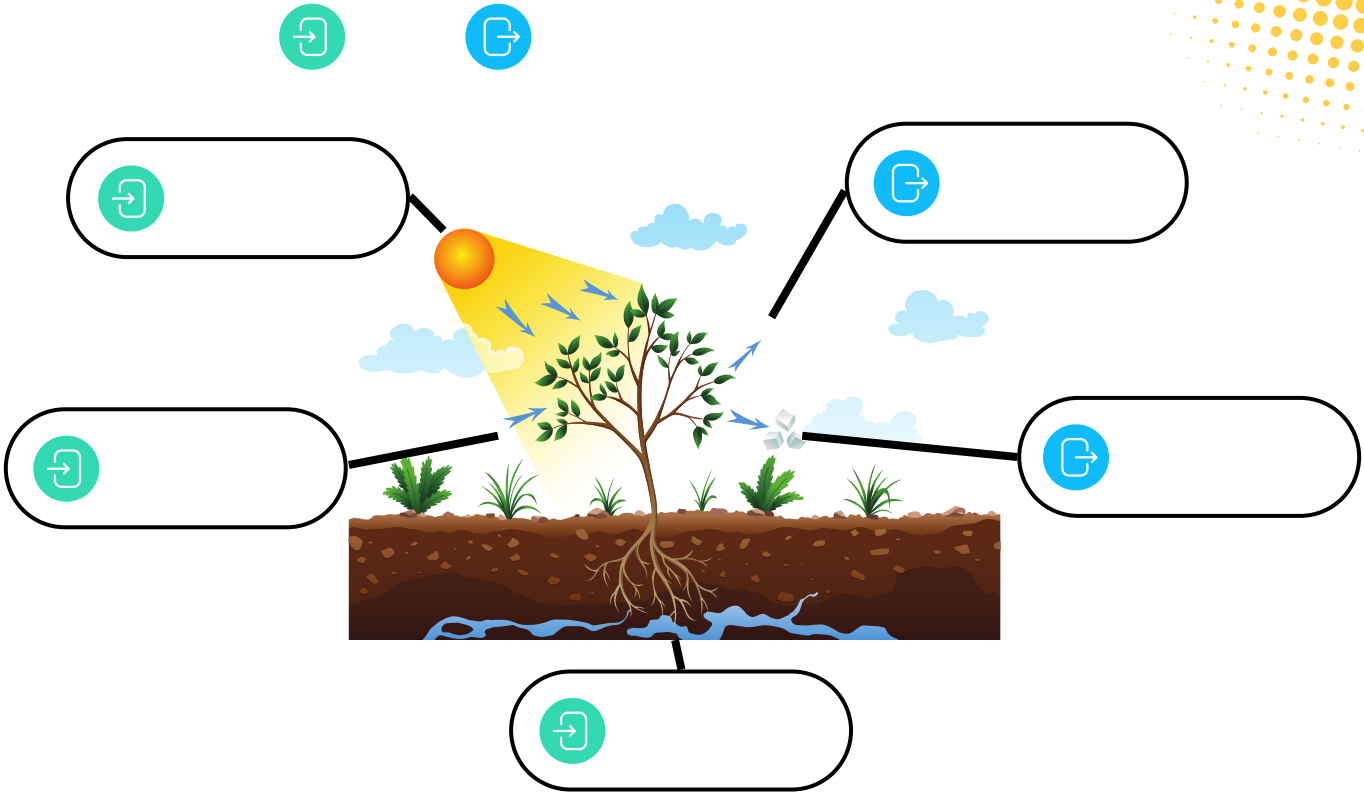




NAME _____ DATE _____

LEAVES AND PHOTOSYNTHESIS

1. Label the different inputs and outputs of photosynthesis.



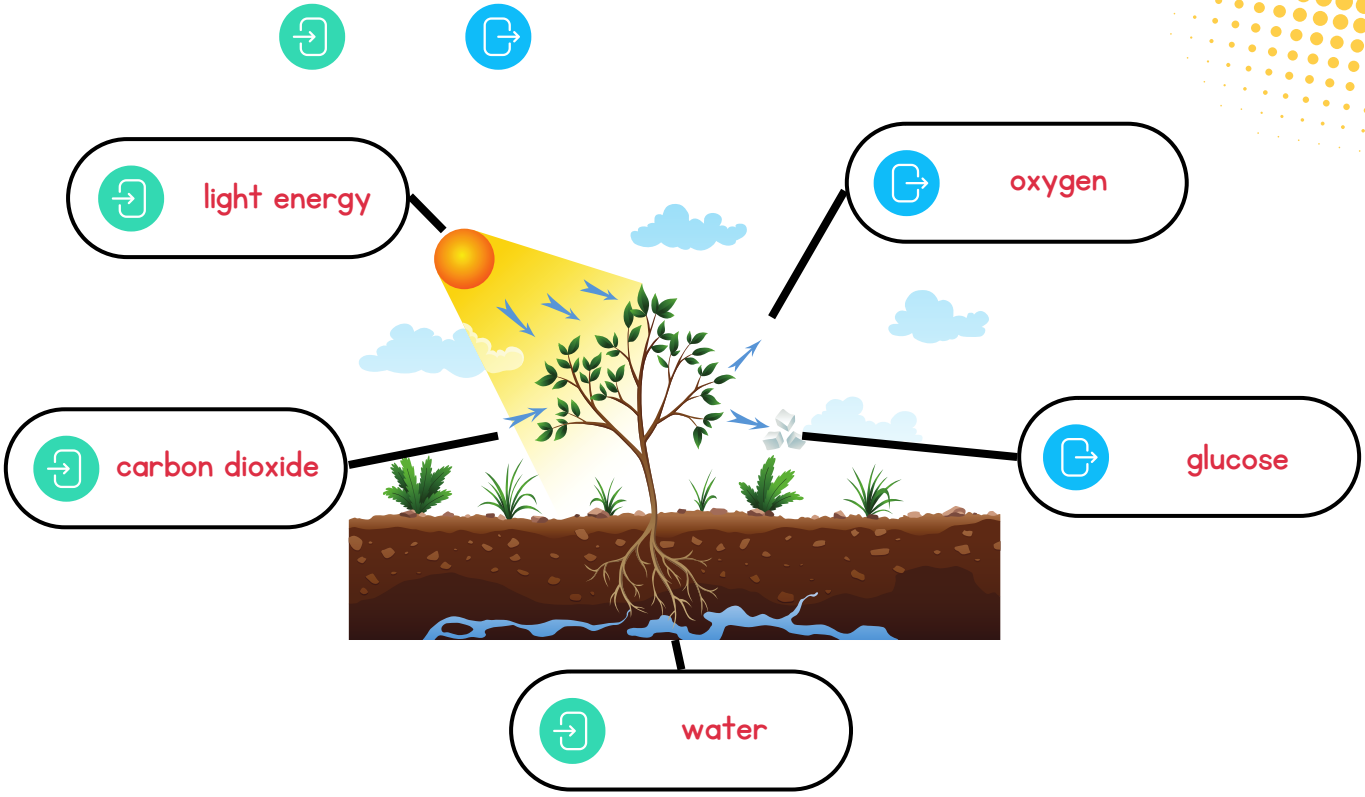
2. What is photosynthesis?	3. How do leaves help plants survive?
4. What are the different parts of a leaf?	5. How do plants help us to survive?

ANSWER KEY

NAME _____ DATE _____

LEAVES AND PHOTOSYNTHESIS

1. Label the different inputs and outputs of photosynthesis.



2. What is photosynthesis? Answers will vary. Photosynthesis is a process that plants go through to produce their own food. They take in sunlight and create their own food using chlorophyll, carbon dioxide, and water.	3. How do leaves help plants survive? Answers will vary, but contain some of this information: Leaves are usually green in color because they contain a pigment called chlorophyll. Chlorophyll is what helps the plant to absorb light energy from the sun. The leaves take in carbon dioxide (CO2) from the air and water (H20) from the soil through tiny pores on their surface called stomata. These raw materials then combine in the leaf to make food for the plant.
4. What are the different parts of a leaf? The blade, the petiole, the veins, the stomata, and the waxy cuticle.	5. How do plants help us to survive? They provide us with oxygen and reduce the amount of carbon dioxide in the air.

NAME _____ DATE _____

FLOWERS AND FRUITS

Read the passage and answer the questions that follow.

Flowers and fruits are important parts of many plants. Flowers are the plant's reproductive parts, and fruits are the structures that contain seeds.

Flowers have different parts, including petals, sepals, stamens, and pistils. The petals are usually the colorful part of the flower that attracts pollinators like bees and butterflies. The sepals are the small, leaf-like structures that protect the flower before it blooms. The stamens are the male reproductive organs of the flower, which produce pollen. The pistil is the female reproductive organ, which contains the ovary that produces seeds.

When a pollinator visits a flower, it collects pollen from the stamens and transfers it to the pistil. This fertilizes the flower, and the ovary begins to develop into a fruit.

Fruits also have different parts, including the skin or outer layer, the flesh or edible part, and the seeds. The skin protects the fruit and helps it to ripen. The flesh is part of the fruit that we eat and contains vitamins and nutrients. The seeds are part of the fruit that can grow into new plants.

Plants produce fruits to help spread their seeds and ensure the survival of their species. Many fruits are also delicious and nutritious, making them a popular part of our diets.

So, next time you enjoy a juicy apple or a sweet strawberry, remember that it all started with a flower!

NAME _____ DATE _____

FLOWERS AND FRUITS

1. Use the passage to draw and label the parts of a flower.

2. What is the purpose of a flower?	3. What is the purpose of a fruit?
4. List at least 5 different types of fruits.	5. Give an example of a flower that is commonly used in gardening or decorating.

ANSWER KEY

NAME _____ DATE _____

FLOWERS AND FRUITS

1. Use the passage to draw and label the parts of a flower.

Answers will be based on the text above.

2. What is the purpose of a flower? Answers will vary. Flowers are the reproductive part of a plant to create more plants, pollen, and fruit.	3. What is the purpose of a fruit? Answers will vary. Fruit helps to spread seeds to ensure the survival of the plant.
4. List at least 5 different types of fruits. Any kind of fruit will be acceptable. Strawberry, tomato, lemon, blueberry, orange, etc.	5. Give an example of a flower that is commonly used in gardening or decorating. Any type of flower will be acceptable. Tulip, sunflower, lily, marigold, rose, etc.