

Lesson 4: Photosynthesis

Getting Started

✿ Questions to Explore

- How are plants dependent on the environment?
- How are plants and animals interdependent?

📖 Facts and Definitions

- **Photosynthesis** is the process by which a plant makes its own food.

🕒 Skills

- Observe and measure how the quantities and qualities of nutrients, light, and water in the environment affect plant growth. (S)
- Observe and describe how environmental conditions determine how plants survive and grow in a particular environment. (S)
- Identify and describe the process of photosynthesis. (S)

✂ Materials

- colored pencils or markers* (Activity 1 - Option 2)
- construction paper (kit)
- glue
- grass seed (kit)
- piece of cardboard
- potting soil (kit)
- science journal
- scissors
- shallow pan

Introduction

Ask your child what animals need in order to live and grow and how plants are different from animals. Next, ask what plants need to grow. Your child will know that plants need sun and water to grow. Ask your child if she knows why plants need sun and water. Then ask how plants get food if they are not able to move like animals can. Explain to your child that plants are able to make their own food, unlike people, animals, and insects that find food and eat it.

Activities

Activity 1: Steps in Photosynthesis

Explain to your child that **photosynthesis** is the term we use to describe the process by which plants make their own food. Tell your child that *photo* means light and *synthesis* means to build. Photosynthesis is literally how plants use light to build sugar.

Before you choose from the option for this activity, watch the video and read the websites listed below.



Photosynthesis - How Plants Make Food

www.beyondthepage.com/link/10951/



How Do Plants Make Food

www.beyondthepage.com/link/10952/

This website from the Missouri Botanical Garden explains how plants use photosynthesis make food.

Review the steps in the photosynthesis process listed below.

1. Water and minerals enter the plant through the roots and travel through the stem and into the leaves.
2. Carbon dioxide enters the leaves through tiny holes on the bottom of the leaves.
3. Chlorophyll (the green pigment in the leaves) absorbs light and taps energy from the light.
4. The plant uses the energy to change carbon dioxide and water into a sugar called glucose.
5. The plant uses the sugar as its food.
6. Photosynthesis also produces the oxygen needed by people and animals.

Give your child the sheet, "Steps in Photosynthesis," and let her cut the steps apart (without the numbers). Fold two pieces of construction paper horizontally into three parts as pictured on the diagram. At the top of each section of the paper, ask your child to glue the steps of the photosynthesis process in order. Then she will either match the pictures with the steps (Option 1) or illustrate each step (Option 2).

Steps in Photosynthesis Diagram

1.		2.		3.		4.		5.		6.	

Option 1

For this option, your child will match the picture with the steps in the process of photosynthesis.

Option 2 (Advanced)

For this option, your child will order the steps and illustrate each step in the process of photosynthesis on construction paper. (Do not provide pictures.)

Activity 2: Experimenting with Photosynthesis

Ask your child how water gets to the leaves of a plant. Review the fact that water is absorbed into the roots from the soil. Then discuss how plants use the sun to make food. To demonstrate that plants need sunlight

for photosynthesis, conduct the following experiment.

Spread some potting soil on a pan, sprinkle grass seeds on top, and water the soil until it is moist but not wet. Keep the soil in a sunny place and water it to keep it moist for about a week. Once the grass is about 1/2-inch high, use a piece of cardboard to cover half of the grass. After another week has gone by, compare the grass in the sunny side of the pan to the dark side of the pan.

Discuss with your child that plants need light in order to grow. Without light, they cannot carry out photosynthesis to create the energy they need to live.

Note: If the weather is cold, you can modify the experiment by using a household plant. Let your child cut two or three shapes out of aluminum foil about the size of half of a leaf on the plant. She can paperclip the shapes to the leaves. After four or five days, she can take the shapes off and compare the leaves that had the shapes with those that did not have an aluminum shape.

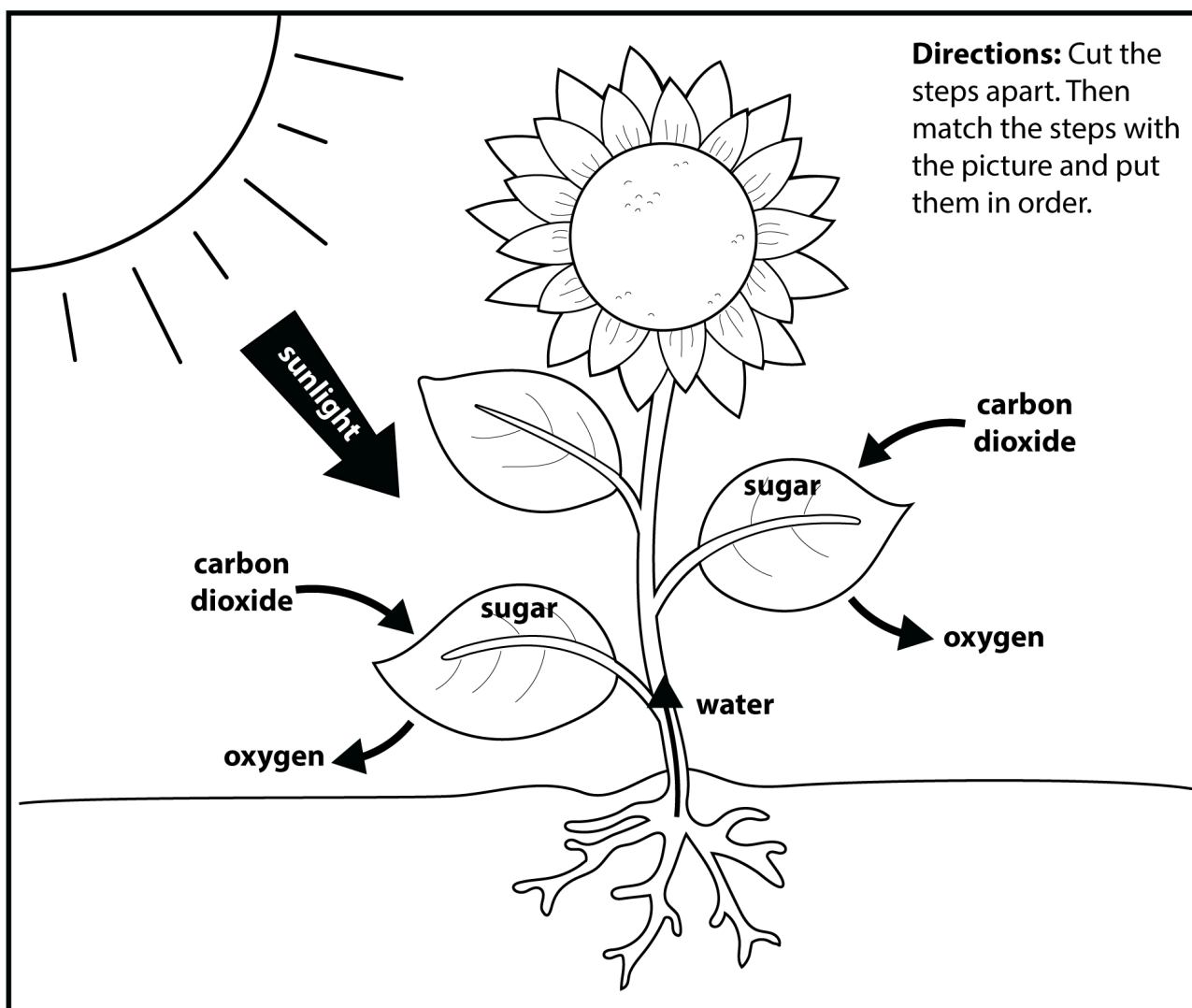
Activity 3: A Mini Quiz

Now your child will take a quiz about what she has learned about plants so far. Tell her to answer each question on the page, "A Mini Quiz," using complete sentences. She can find help in books and previous activities. If your child needs more space for her answers, she can write them in her science journal.

Wrapping Up

Ask your child to describe the process of photosynthesis. Discuss what plants need in order for photosynthesis to occur.

Steps in Photosynthesis



Photosynthesis also produces the oxygen needed by people and animals.

The plant uses sugar as its food.

Carbon dioxide enters the leaves through tiny holes on the bottom of the leaves.

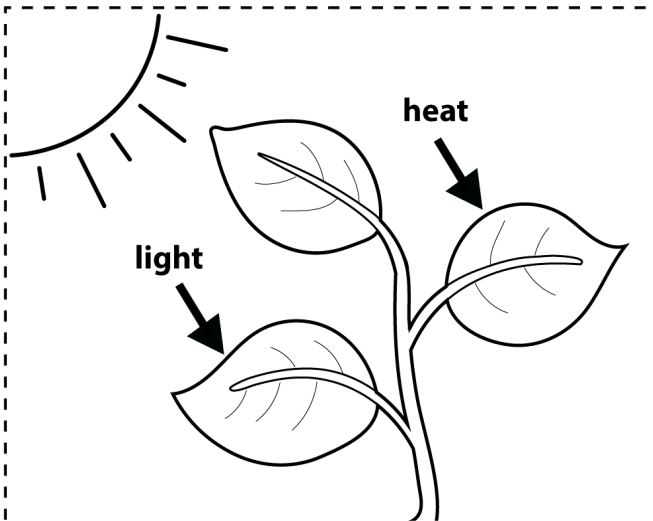
Water and minerals enter the plant through the roots and travel through the stem and into the leaves.

Chlorophyll (the green pigment in the leaves) absorbs light and taps energy from the light.

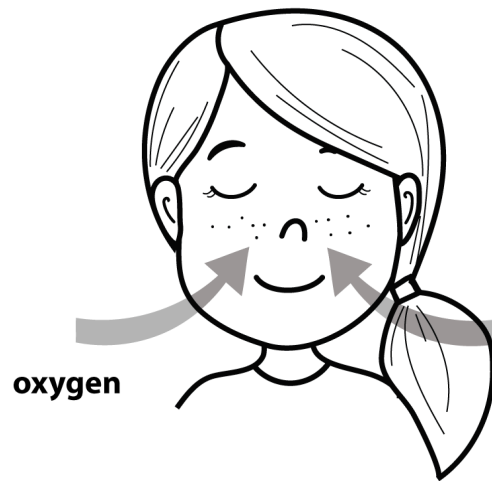
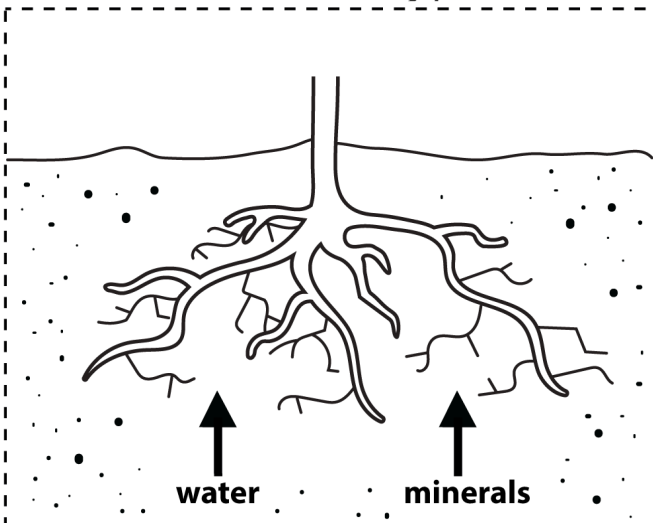
The plant uses the energy to change carbon dioxide and water into a sugar called glucose.

Steps in Photosynthesis

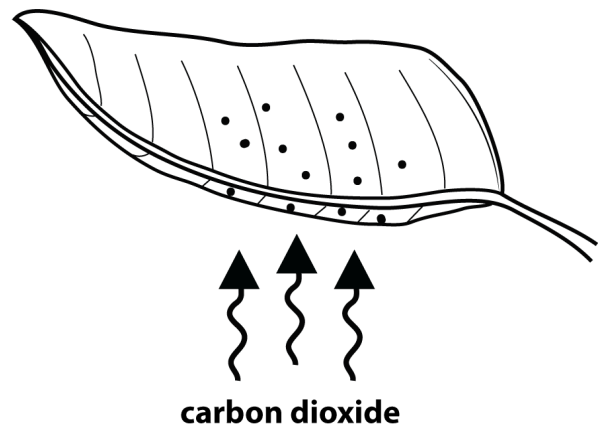
Directions: Turn two pieces of construction paper horizontal and fold each into three parts. Glue the steps of the photosynthesis process in order with one in each section and then match the pictures with the steps on the previous page.



carbon dioxide
+
water
+
energy
=
glucose



glucose
↓
sugar
=
food



A Mini Quiz

Directions: Answer the questions below using complete sentences. Use books and previous activities to help with your answers.

1. Pretend you bought a new plant for your mom. Write a set of directions that explains what the plant needs and how your mom should care for it.

2. Your little brother is trying to feed a potted plant in the window a snack. He thinks it will starve if it does not eat. Describe to him how plants make their own food.

3. You pick up a handful of dirt at the park and your friend asks you what is dirt made from. What do you tell him?

4. Your little sister is afraid of bees and says that she wishes that there were no bees in the world. Record what you would say to her about the importance of bees.

5. A seed is carried by the wind to a soft place in the dirt. Explain what will happen to this seed as it germinates and turns into a new plant.
