

# Photosynthesis

## Key Words

<b>producers:</b>	organisms that can make their own food
<b>photosynthesis:</b>	process by which producers change light energy from the sun into chemical energy
<b>chlorophyll:</b>	green pigment contained in chloroplasts which traps light energy necessary for photosynthesis

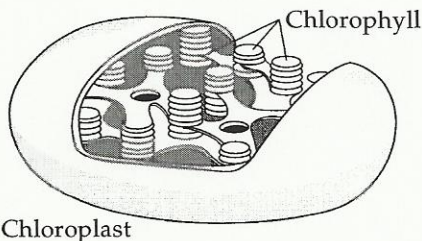
## KEY IDEAS

Producers are organisms that can make their own food. The process by which producers change energy from the sun into chemical energy is called photosynthesis. Photosynthesis occurs in chloroplasts.

If you've ever visited a plant nursery, you've probably seen all kinds of plants for sale. Have you ever wondered whose job it was to keep the plants healthy? It's the job of the nursery manager. The manager oversees the growth of plants from seeds or cuttings. The manager also makes sure that the plants get all the things they need to stay healthy.

**Photosynthesis.** Organisms that can make their own food are called **producers** (pro-DOO-surhz). Plants and blue-green bacteria are two kinds of producers. They make food through photosynthesis. **Photosynthesis** (foht-oh-SIHN-thuh-sihs) is the process by which producers change energy from the sun into chemical energy.

Fig. 7-1



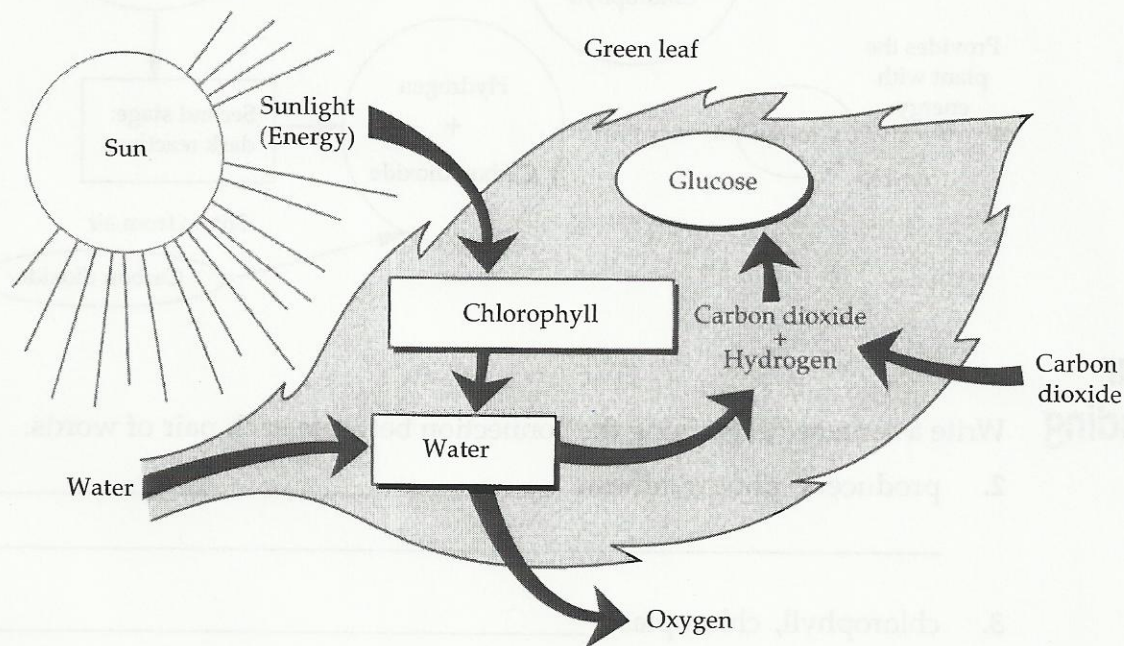
Recall from Lesson 4 that plant cells contain organelles called chloroplasts. These large, oval structures, shown in Fig. 7-1 are located in the cytoplasm of the cell. Inside the chloroplasts is a green pigment called chlorophyll. **Chlorophyll** (KLAWR-uh-fihl) traps the light energy necessary for photosynthesis.

Chloroplasts and chlorophyll are not the only things needed for photosynthesis. The plant also needs sunlight, water, and carbon dioxide from the air.

Photosynthesis occurs in two stages. The first stage is the light reactions and the second stage is the dark reactions. Light reactions begin when sunlight is absorbed by chlorophyll. The sun's energy is used to split water molecules into hydrogen and oxygen. The oxygen is released as a waste product.

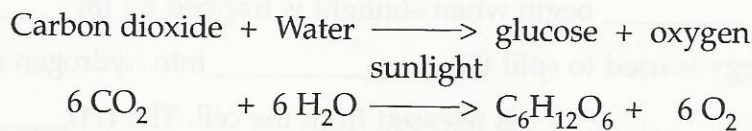
Dark reactions begin when the hydrogen formed in the light reaction combines with carbon dioxide. These combined substances produce glucose, a simple sugar. Glucose is the food made by producers. Glucose gives the plant the chemical energy it needs to carry out its life processes. Fig. 7-2 show how photosynthesis occurs in a leaf.

Fig. 7-2



- ✓ 1. During which stage of photosynthesis does water split into hydrogen and oxygen? \_\_\_\_\_

The following equation shows the chemical changes that occur when plants convert sunlight into chemical energy.

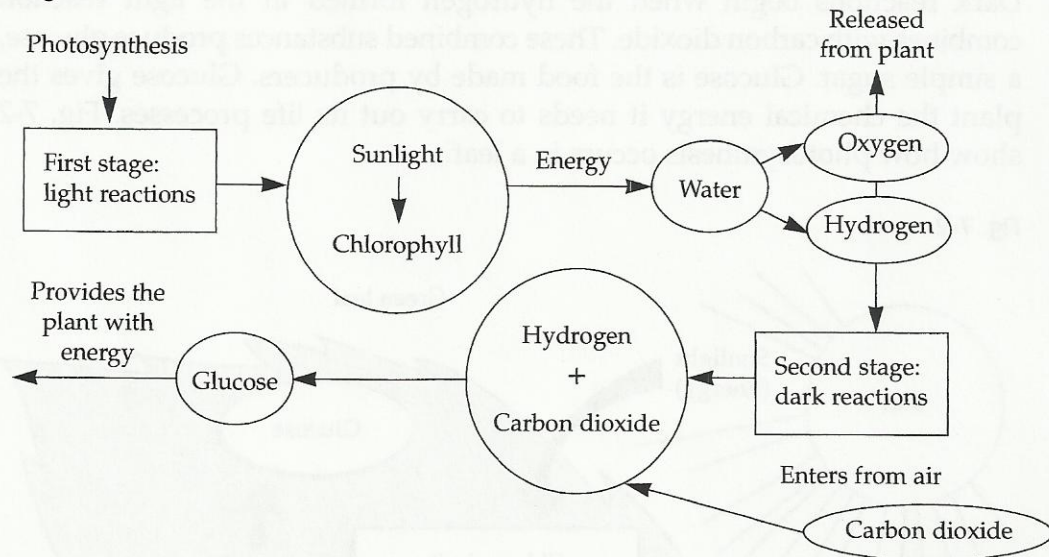




# TAKE ANOTHER LOOK

Producers need chlorophyll, sunlight, water, and carbon dioxide for photosynthesis. Fig. 7-3 shows the light reactions and dark reactions that take place during photosynthesis.

Fig. 7-3



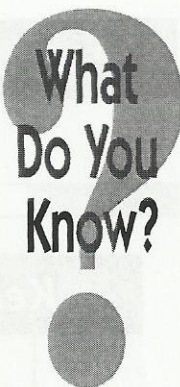
## Check Your Understanding

Write a sentence explaining the connection between each pair of words.

2. producers, photosynthesis \_\_\_\_\_  
\_\_\_\_\_
  
3. chlorophyll, chloroplasts \_\_\_\_\_  
\_\_\_\_\_

Complete the passage with the following terms: *chlorophyll, chloroplasts, dark reactions, glucose, light reactions, oxygen, photosynthesis, producers, water.*

Organisms that can make their own food are (4) \_\_\_\_\_. The process by which most producers make food is called (5) \_\_\_\_\_. Photosynthesis occurs in the (6) \_\_\_\_\_ of a plant cell. The (7) \_\_\_\_\_ begin when sunlight is trapped by (8) \_\_\_\_\_. This energy is used to split (9) \_\_\_\_\_ into hydrogen and oxygen. The (10) \_\_\_\_\_ is released from the cell. The (11) \_\_\_\_\_ begin when the hydrogen combines with carbon dioxide. (12) \_\_\_\_\_ is produced, which supplies the cell with energy.



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13. What is the role of chlorophyll in photosynthesis? \_\_\_\_\_

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14. What three things do plants need for photosynthesis to occur?

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\_\_\_\_\_

15. What occurs during the light reactions of photosynthesis?

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\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

16. What occurs during the dark reactions of photosynthesis?

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\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

17. Where does a plant get the carbon dioxide it needs for photosynthesis?

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18. Animal cells do not contain chloroplasts. Do you think animal cells are able to produce glucose through photosynthesis? Explain.

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