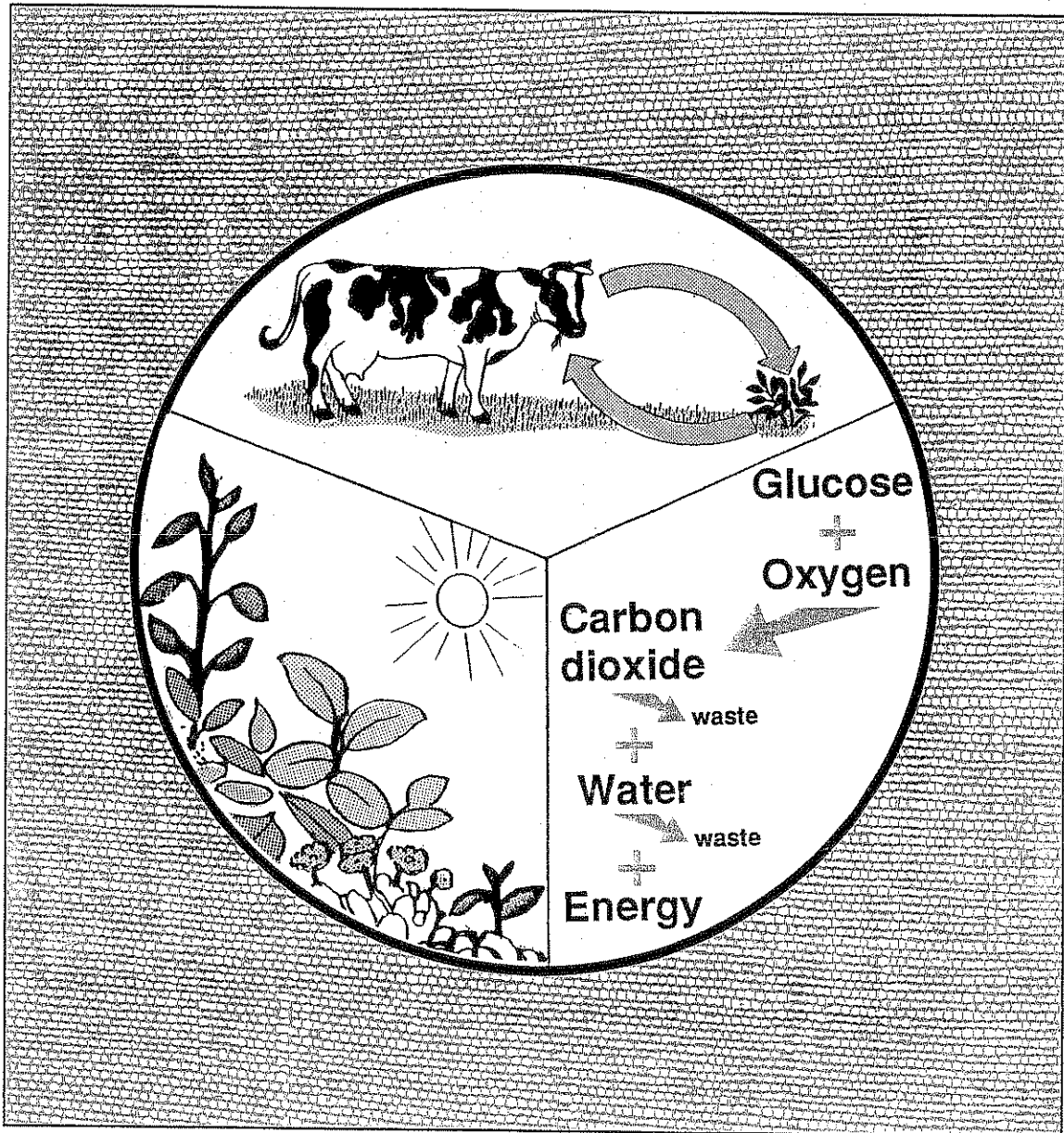


# How do living things get their energy?



photosynthesis [foht-uh-SIN-thuh-sis]: food making process in plants  
 respiration [res-puh-RAY-shun]: process by which organisms obtain energy from food  
 stomata [STOH-muh-tuh]: tiny openings in a leaf

# LESSON 16 How do living things get their energy?

You need energy to live, so do plants. All living things need energy to carry out their life processes.

How do plants and animals get energy? The same way your car gets its energy—by burning a fuel. Cars use gasoline as a fuel. Energy is released when oxygen from the air combines with the gasoline in the engine.

Plants and animals use glucose as a fuel. Glucose is a simple sugar. Energy is produced when oxygen combines with glucose. This energy-producing process is called **respiration** [res-puh-RAY-shun]. You may remember that respiration is one of the life processes.

## WHERE DOES GLUCOSE COME FROM?

Animals ingest food. They eat plants or other animals. During digestion, some of this food is changed to glucose. Animals use this glucose for energy.

Plants are different. They make their own food in a process called **photosynthesis** [foht-uh-SIN-thuh-sis].

Photosynthesis takes place in the leaves of green plants. The cells of green plants have structures called chloroplasts. Chloroplasts contain the green substance chlorophyll. Chlorophyll traps light energy from the sun. Light energy is needed for plants to make their own food.

Plants also need two other substances to make their own food — water and carbon dioxide.

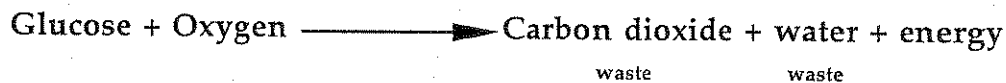
- Water enters a plant through its roots.
- Most carbon dioxide enters a plant through tiny holes in its leaves called **stomata** [STOH-muh-tuh].

## MORE ABOUT RESPIRATION AND PHOTOSYNTHESIS

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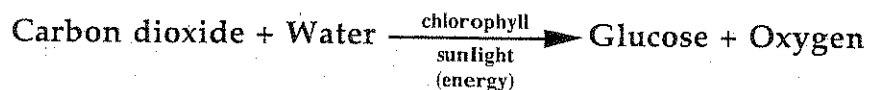
The energy-producing process in living things is called respiration. Respiration is the release of energy by combining oxygen with digested food (glucose). Carbon dioxide and water are also produced. They are waste products of respiration.

A simple way to show respiration is this:



The food-making process of green plants is called photosynthesis. Photosynthesis is also responsible for the production of oxygen.

Photosynthesis can be shown in this way:



Using the above information, answer the following questions.

1. What do we call the release of energy by living things? \_\_\_\_\_
2. Respiration is \_\_\_\_\_ in plants and animals.  
different, the same
3. Two waste products produced by respiration are \_\_\_\_\_ and \_\_\_\_\_.
4. What fuel do living things use for energy? \_\_\_\_\_
5. What must link up with this fuel to produce energy? \_\_\_\_\_
6. Do plants take in food from the outside? \_\_\_\_\_
7. How do plants obtain food? \_\_\_\_\_
8. The food-making process of plants is called \_\_\_\_\_.

9. Photosynthesis chemically combines two products. Name them.

\_\_\_\_\_

\_\_\_\_\_

10. Photosynthesis also requires energy and the green substance called

\_\_\_\_\_

11. In which part of a plant does most photosynthesis take place?

\_\_\_\_\_

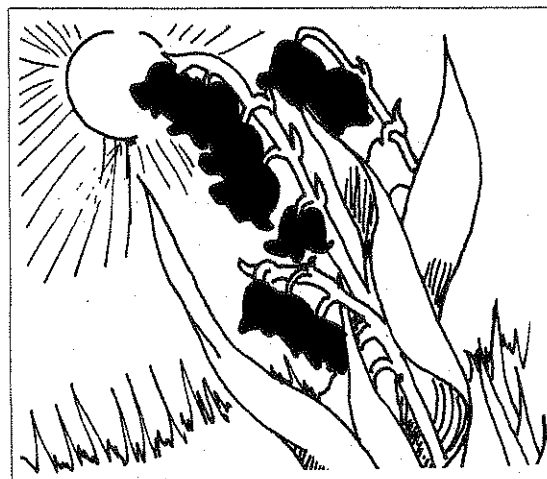


Figure A

Study Figure B carefully. Then answer these questions.

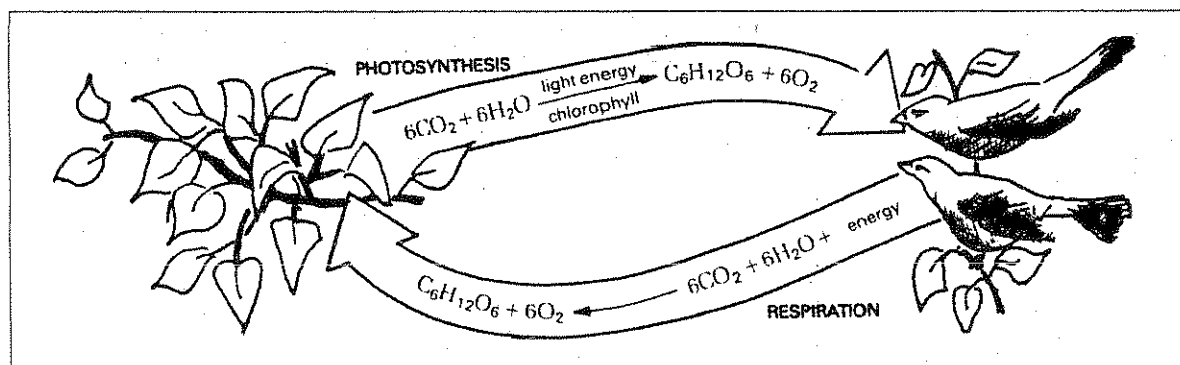


Figure B

12. In photosynthesis,

a) what are the starting products? \_\_\_\_\_ and \_\_\_\_\_

b) what are the end products? \_\_\_\_\_ and \_\_\_\_\_

13. In respiration,

a) what are the starting products? \_\_\_\_\_ and \_\_\_\_\_

b) what are the end products? \_\_\_\_\_ and \_\_\_\_\_

14. a) Is energy needed for photosynthesis to take place? \_\_\_\_\_

b) Is energy produced by respiration? \_\_\_\_\_

15. Photosynthesis and respiration are \_\_\_\_\_ reactions.  
the same, opposite

## WHAT DOES THE PICTURE SHOW?

This picture shows photosynthesis taking place. When green plants are in sunlight, this is what happens:

water plus carbon dioxide makes glucose and oxygen.

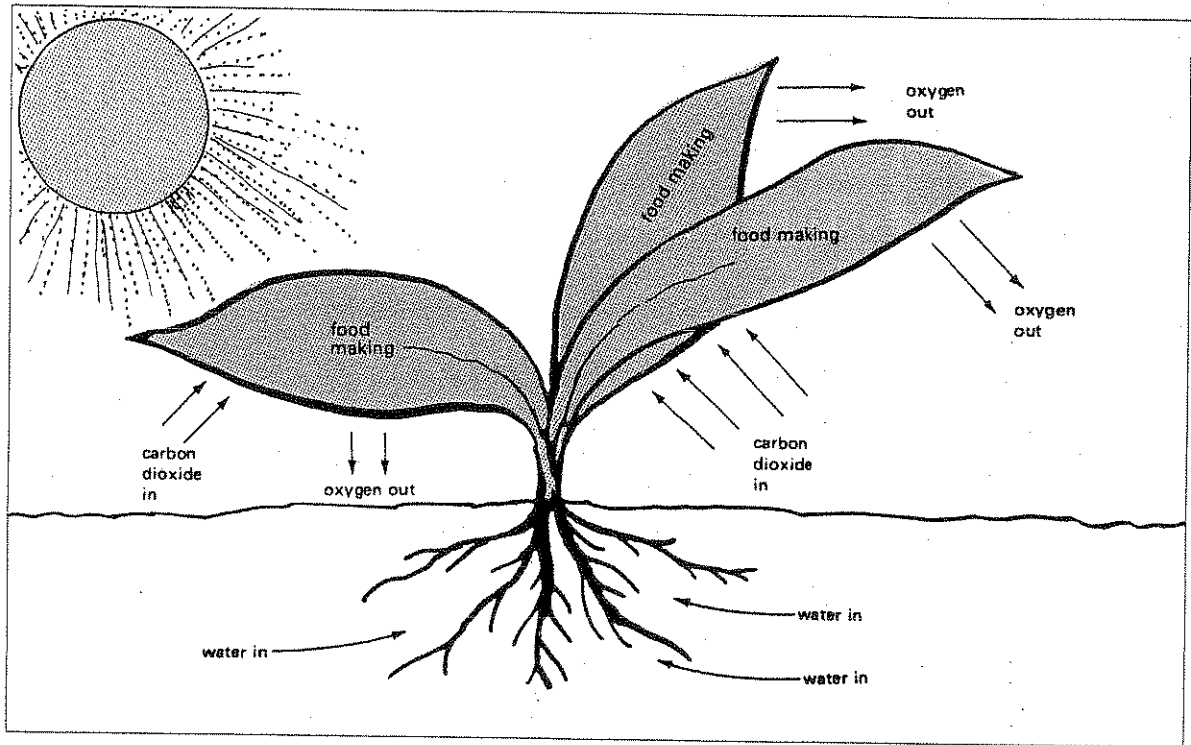


Figure C

Look at Figure C and then answer the following questions about photosynthesis.

1. Does photosynthesis take place in the leaves or in the roots? \_\_\_\_\_
2. What two materials must a plant take in for photosynthesis? \_\_\_\_\_  
\_\_\_\_\_
3. What else is needed for photosynthesis? \_\_\_\_\_
4. Where does the carbon dioxide gas come from? \_\_\_\_\_
5. What are the two things that photosynthesis makes? \_\_\_\_\_
6. What does a plant make as food? \_\_\_\_\_
7. Where does water enter a plant? \_\_\_\_\_
8. Where does carbon dioxide enter a plant? \_\_\_\_\_
9. Where does oxygen leave a plant? \_\_\_\_\_
10. What living things use the oxygen? \_\_\_\_\_

## FILL IN THE BLANK

Complete each statement using a term or terms from the list below. Write your answers in the spaces provided. Some words may be used more than once.

chlorophyll  
glucose  
respiration

life processes  
carbon dioxide  
water

photosynthesis  
oxygen

1. The release of energy in living things is called \_\_\_\_\_.
2. Respiration links up the simple sugar, \_\_\_\_\_ with the gas, \_\_\_\_\_.
3. The waste products of respiration are \_\_\_\_\_ and \_\_\_\_\_.
4. The energy released during respiration is used for the \_\_\_\_\_.
5. The food-making process of plants is called \_\_\_\_\_.
6. The products that chemically link up during photosynthesis are \_\_\_\_\_ and \_\_\_\_\_.
7. The substance in the leaves of green plants that is needed for photosynthesis is \_\_\_\_\_.

## REACHING OUT

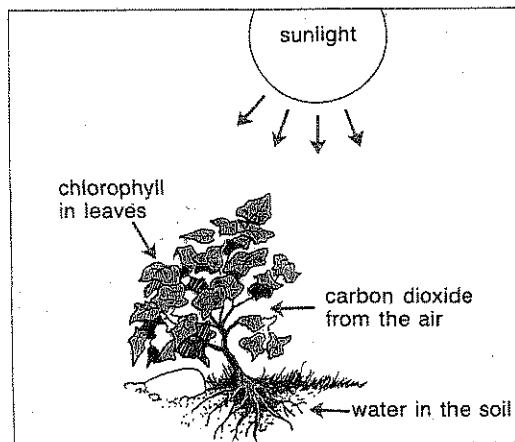


Figure D Photosynthesis

1. A plant makes its own food (glucose). Plants also make other nutrients. These nutrients are made of glucose, water, and minerals. How does a plant get minerals?  
\_\_\_\_\_
2. Algae have chlorophyll and carry out photosynthesis. How do algae get their food?  
(Hint: You can look back at Lesson 22 if you need help.) \_\_\_\_\_  
\_\_\_\_\_