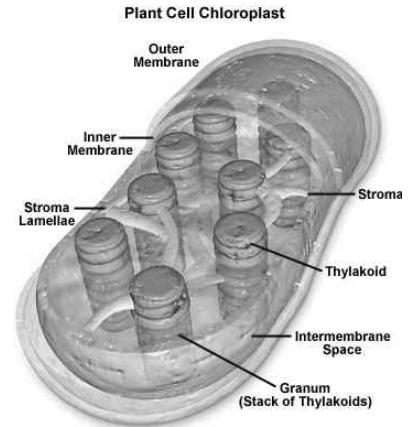


# Photosynthesis: Making Energy

## Chloroplasts

Photosynthesis is a process in which sunlight energy is used to make glucose. The site of photosynthesis is in the **chloroplast** - an organelle found in the leaves of green plants. The main functions of chloroplasts are to produce food (**glucose**) during **photosynthesis**, and to store food energy. Chloroplasts contain the pigment, *chlorophyll*. Chlorophyll absorbs most of the colors in the color spectrum, and reflects only green and yellow wavelengths of light. This is why we see leaves as green or yellow - because these colors are reflected into our eyes.



1. What is photosynthesis? \_\_\_\_\_
2. Where does photosynthesis occur? \_\_\_\_\_
3. What are chloroplasts and where are they found? \_\_\_\_\_
4. What are the two main functions of chloroplasts? \_\_\_\_\_
5. Why does most leaves appear green? \_\_\_\_\_
6. What is the primary pigment found in the chloroplast? \_\_\_\_\_

## Photosynthesis

Glucose is another name for sugar. The molecular formula for glucose is  $C_6H_{12}O_6$ . Plants make sugar by using the energy from sunlight to transform  $CO_2$  from the air with water from the ground into glucose. This process, called photosynthesis occurs in the chloroplast of the plant cell. During this process, oxygen ( $O_2$ ) is created as a waste product and is released into the air for us to breath. The formula for photosynthesis is:



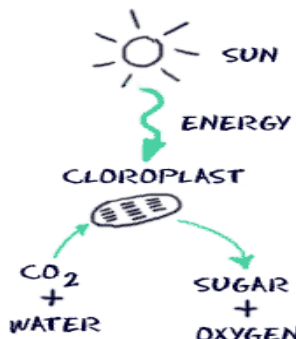
This formula says that carbon dioxide + water molecules are combined with the energy from sunlight to produce sugar and oxygen. The reactants in photosynthesis (what is used) are  $CO_2$ , water and sun. The plant gets water from the ground through its roots. The plant collects carbon dioxide from the air. Much of the carbon dioxide comes from living organisms that exhale (breath it out) it, but some also comes from factory smokestacks and car fumes.

7. What is the formula for photosynthesis? \_\_\_\_\_
8. What three things are used to make glucose in photosynthesis? \_\_\_\_\_

9. Where does the water come from? \_\_\_\_\_
10. Where does the water enter the plant? \_\_\_\_\_
11. Name 3 some sources of CO<sub>2</sub>. \_\_\_\_\_
12. What type of energy does the plant use to convert CO<sub>2</sub> and H<sub>2</sub>O into sugar? \_\_\_\_\_

The products are **glucose** and **oxygen**. The glucose produced is used by the plant for energy and growth. We also use this glucose by eating plants. The oxygen produced is released into the air for us to breath. Photosynthesis is essential for all life on earth, because it provides food and oxygen. Plants are considered autotrophs because unlike us humans, they can make their own food using this process.

13. What is produced in photosynthesis? \_\_\_\_\_
14. What is the glucose used for? \_\_\_\_\_
15. What is the oxygen used for? \_\_\_\_\_
16. Here are three different ways to visualize the photosynthesis reaction: Is it easier for you to understand the reaction by using pictures, words, or symbols (see above)? Why?  
 \_\_\_\_\_  
 \_\_\_\_\_

Photosynthesis in pictures	Photosynthesis in words	Photosynthesis in symbols
	<p>Carbon dioxide and water combine with sunlight to create oxygen and glucose.</p>	$CO + H_2O \xrightarrow{\text{light}} C_6H_{12}O_6 + O_2$

**Essential Question:** Describe, using scientific terms, how plants turn sunlight into energy? Make sure to refer to the chemical equation to photosynthesis and discuss the reactants and products.

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