



SECTION

4.2

OVERVIEW OF PHOTOSYNTHESIS

Reinforcement

**KEY CONCEPT** The overall process of photosynthesis produces sugars that store chemical energy.

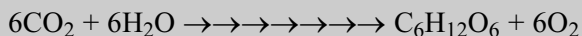
Some organisms, called producers, make their own carbon-based molecules, such as carbohydrates, that are broken down to make ATP. The process that many producers, including plants, use to make their own source of food is called photosynthesis.

**Photosynthesis** is a process that captures energy from sunlight to make sugars that store chemical energy.

In plants, photosynthesis takes place in organelles called chloroplasts. Chloroplasts contain molecules, such as **chlorophyll**, that absorb energy from light. Most of a plant's chloroplasts are in leaf cells specialized for photosynthesis. Chloroplasts have two main parts used for photosynthesis: the grana, which contain disk-shaped structures called **thylakoids**, and the stroma, which is the fluid that surrounds the grana. Photosynthesis takes place in two main stages.

- The first stage is called the light-dependent reactions. In the **light-dependent reactions** chlorophyll absorbs energy from sunlight and water molecules are broken down. Energy is transferred to molecules such as ATP. Oxygen is released as a waste product.
- The second stage is called the light-independent reactions. In the **light-independent reactions** energy from the light-dependent reactions is used to build sugar molecules from carbon dioxide.

The overall, simplified chemical equation for the photosynthesis process is:



1. What is photosynthesis?

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2. Where does photosynthesis take place in plants?

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3. What happens during the light-dependent reactions?

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4. What happens during the light-independent reactions?

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5. What are the reactants and the products of photosynthesis?

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