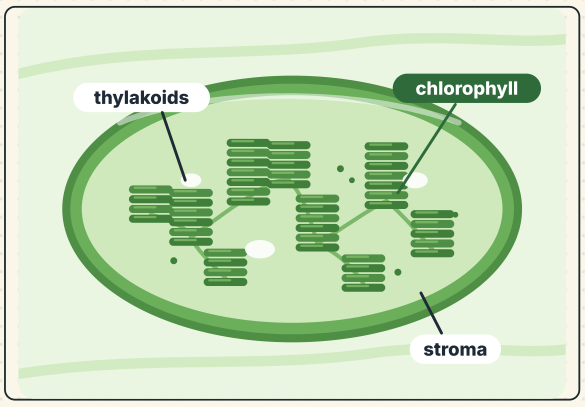
PHOTOSYNTHESIS PART 5 OF 9 · AGES 11–16

Photosynthesis Key Terms

The equations and words you need to explain photosynthesis precisely, each with a one-line meaning.



∑ The equations

carbon dioxide + water → glucose + oxygen	**Word equation** Light energy, absorbed by chlorophyll, drives the reaction. Write 'light' above the arrow.
$6CO_2 + 6H_2O \rightarrow C_6H_{12}O_6 + 6O_2$	**Balanced symbol equation** Six carbon dioxide and six water molecules make one glucose and six oxygen. Both sides have 6 C, 12 H and 18 O atoms.
Endothermic reaction	A reaction that takes in energy. Photosynthesis transfers light energy from the surroundings into chemical energy stored in glucose.

Where it happens

Chloroplast	The small structure (organelle) in a plant or algal cell where photosynthesis happens. Palisade cells contain many of them.
Chlorophyll	The green pigment inside chloroplasts that absorbs light energy, mainly red and blue light. Each molecule has a magnesium atom at its centre.
$C_6H_{12}O_6$	**Glucose** The simple sugar made by photosynthesis. It stores chemical energy and is the starting point for everything else the plant builds.
Producer	An organism that makes its own food by photosynthesis, such as a plant or an alga. Producers start almost every food chain.

How fast it goes

Rate of photosynthesis	How fast it happens, measured as oxygen made or carbon dioxide used in a set time, such as bubbles per minute from pondweed.
Limiting factor	Whatever is in shortest supply (light, carbon dioxide, a suitable temperature or chlorophyll) and so holds the rate back.
light intensity ∝ 1 / distance²	**Inverse square law** Double the distance between a lamp and a plant and the light intensity falls to a quarter.

What glucose is used for

Respiration	Glucose is broken down with oxygen to release energy for the plant's cells, day and night.
Starch	Many glucose units joined into an insoluble energy store, kept in leaves, seeds and tubers. Iodine turns blue-black with starch.
Fats and oils	Compact energy stores made from glucose, found especially in seeds.
Cellulose	Long fibres built from glucose that strengthen plant cell walls.
Amino acids and proteins	Glucose combined with nitrate ions taken from the soil makes amino acids, which are joined to build proteins.

Count the atoms

To check the symbol equation, count each element on both sides: 6 carbon, 12 hydrogen and 18 oxygen atoms. And oxygen gas is always O_2, never O.

NEXT IN THE SERIES
6. How We Discovered Photosynthesis: A Timeline

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