

★ **HIGHER TIER ONLY** content is highlighted in blue. Foundation students — focus on the un-highlighted sections.

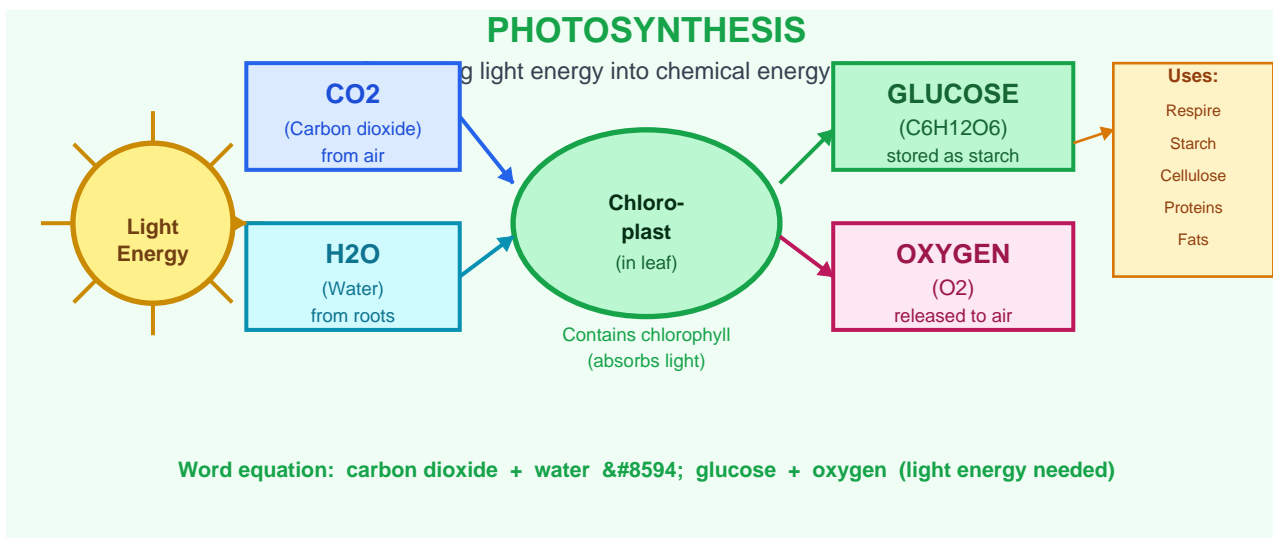


Fig: Photosynthesis summary — inputs, outputs and where it happens

Limiting Factors of Photosynthesis

Limiting Factor	Effect of increasing it	Example situation
Light intensity	Rate increases up to a point	Dim cloudy day slows photosynthesis
CO ₂ concentration	Rate increases up to a point	CO ₂ already high — adding more has no effect
Temperature	Rate increases to optimum (~25°C) then DROPS sharply (enzymes denature)	Very hot summer day can slow photosynthesis
Water	Needed as a reactant — shortage slows rate	Drought reduces photosynthesis

Respiration Comparison

Feature	Aerobic Respiration	Anaerobic Respiration
Oxygen needed?	YES	NO
Energy released	LOTS (38 ATP per glucose)	Very little (2 ATP per glucose)
Products	CO ₂ + Water	Animals: Lactic acid Yeast/Plants: Ethanol + CO ₂
Location in cell	Mitochondria	Cytoplasm
When used?	Most of the time	During intense exercise or low O ₂

■ **Exam Tip:** Remember: Aerobic = Air = LOTS of energy. Anaerobic = Without air = small amount of energy.

Aerobic respiration	glucose + oxygen → carbon dioxide + water + LOTS of energy
Anaerobic (animals)	glucose → lactic acid + small amount of energy
Fermentation (yeast)	glucose → ethanol + carbon dioxide + small amount of energy
Oxygen debt	Extra O ₂ needed after exercise to break down lactic acid