

Photosynthesis - Quick Revision Notes

Definition:

- Process by which green plants, algae, and some bacteria convert light energy into chemical energy (glucose) using CO_2 and H_2O

Equation:

- $6\text{CO}_2 + 6\text{H}_2\text{O} + \text{light energy} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2$

Key Organelles:

- Chloroplasts: Contain chlorophyll, the main pigment absorbing light.
- Thylakoids: Site of light-dependent reactions.
- Stroma: Site of Calvin cycle (light-independent reactions).

Stages:

1. Light-dependent reactions (in thylakoids):
 - Absorb sunlight using chlorophyll.
 - Split water $\rightarrow \text{O}_2$ released.
 - Produce ATP & NADPH.
2. Calvin cycle / Light-independent reactions (in stroma):
 - Use CO_2 , ATP, and NADPH to make glucose.
 - Enzyme RuBisCO fixes CO_2 .

Important Points:

- Oxygen is a byproduct of photosynthesis.
- Rate depends on light intensity, CO_2 concentration, temperature, and water availability.
- Two types of pigments: chlorophyll a (primary) and chlorophyll b (accessory).
- Some plants use C_4 or CAM pathways to reduce photorespiration.

Quick Mnemonics:

- CO_2 \rightarrow Calvin cycle
- $\text{H}_2\text{O} \rightarrow \text{O}_2$ released