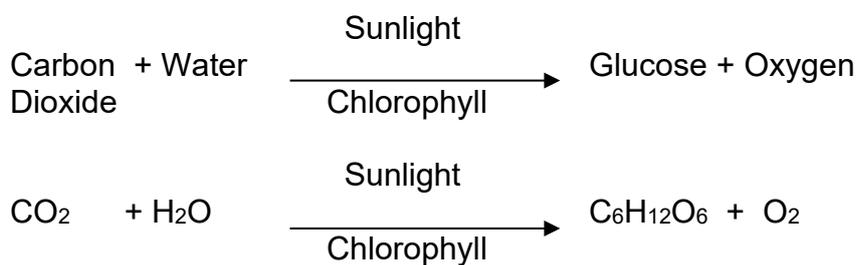
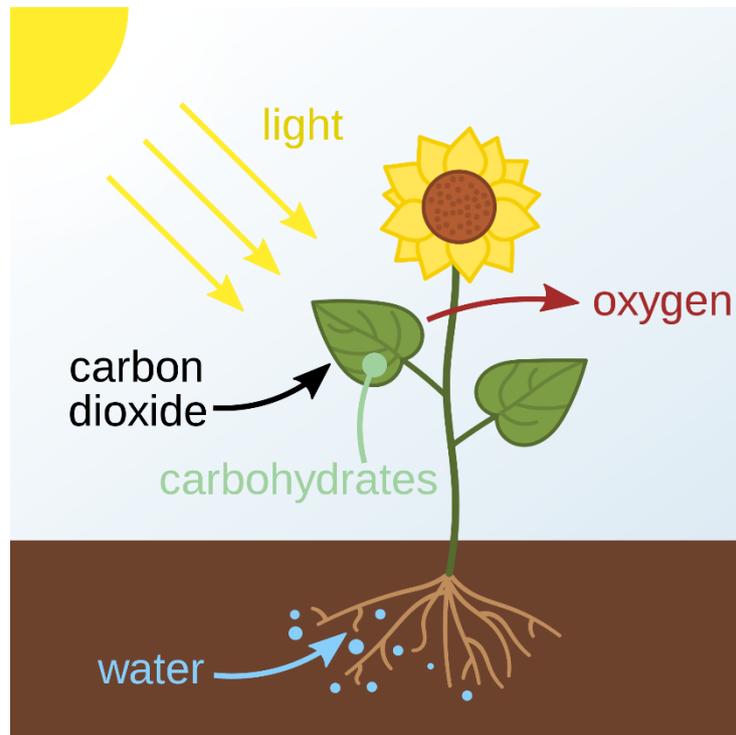


PHOTOSYNTHESIS REACTION



- Photosynthesis is an endergonic reaction.
- The part of the visible light spectrum that is mostly used is blue and red light. These are absorbed by the green chlorophyll which reflects green light.
- There are 2 photosynthetic reactions:
 1. Photophosphorylation or Light-Dependent Reaction ('Light' Reaction) – This occurs on the membranes in chloroplasts. Light that is 'trapped' by chlorophyll drives reactions that produce ATP and NADPH for the next 'dark' reaction. Oxygen is also produced but is released as a by-product.
 2. Carbon Fixation or Light-Independent Reaction ('Dark' Reaction) – This is also called the Calvin-Benson Cycle, and does not require light. It occurs in the stroma of chloroplasts. The NADPH and ATP from the 'Light' Reaction are used to convert carbon dioxide to glucose.

FACTORS AFFECTING PHOTOSYNTHESIS

- Light Intensity – The rate of photosynthesis _____ with light intensity until a certain level is reached.
- Light Wavelengths – Green light is least absorbed, since it is reflected by leaves, which is why leaves appear their _____ colour. Red-orange and violet colours are those more readily absorbed by chlorophyll.
- Carbon Dioxide Levels – Increases in CO₂ concentration _____ the rate of photosynthesis until it levels off.
- Temperature – As the temperature increases slightly, the rate of photosynthesis also _____. However, if the temperature drops too low, plants are unable to make chlorophyll, the leaves turn yellow as in autumn, and they are unable to photosynthesise. If the temperature rises too high, photosynthesis _____.
- Amount of Water – As the photosynthesis reaction requires water, a lack of water decreases the plant's ability to photosynthesise.
- C₃ and C₄ Plants - In C₃ plants, up to 50% of CO₂ trapped by chlorophyll is released before being converted to sugar. C₄ plants have a different enzyme to trap CO₂ and are more efficient in conditions of higher CO₂ concentrations such as that formed by the Greenhouse Effect. Examples of C₄ plants include corn, sorghum and sugarcane.