

Photosynthesis

**What energy transformation happens in photosynthesis?**

Photosynthesis

**Word equation for photosynthesis**

Photosynthesis

**Where does the hydrogen in glucose come from?**

Photosynthesis

**Oxygen in photosynthesis**

Photosynthesis

**Rf value**

Photosynthesis

**Colours of photosynthetic pigments on a chromatogram**

Photosynthesis

**What happens when a pigment absorbs light?**

Photosynthesis

**Absorption spectrum vs action spectrum**

carbon dioxide + water → glucose + oxygen

Light energy is transformed to chemical energy in carbon compounds, supplying most energy for ecosystems.

A by-product from the splitting of water, released by plants, algae and cyanobacteria.

From splitting water molecules, using light energy.

Carotene orange-yellow, xanthophyll yellow, chlorophyll a blue-green, chlorophyll b yellow-green.

Distance moved by pigment ÷ distance moved by solvent front. No units; between 0 and 1.

Absorption: % light absorbed at each wavelength. Action: rate of photosynthesis at each wavelength. Both peak in blue and red.

An electron in the pigment molecule is excited to a higher energy level; only wavelengths matching the energy gap are absorbed.

Photosynthesis

**How can light intensity, CO<sub>2</sub> and temperature be varied?**

Photosynthesis

**Limiting factor**

Photosynthesis

**FACE vs greenhouse CO<sub>2</sub> enrichment**

The factor furthest from its optimum, which limits the rate of photosynthesis.

Light: lamp distance or filters. CO<sub>2</sub>: sodium hydrogencarbonate concentrations.  
Temperature: water baths.

FACE: CO<sub>2</sub> released over field plots, realistic but less controlled. Greenhouse: enclosed, controlled but less natural.