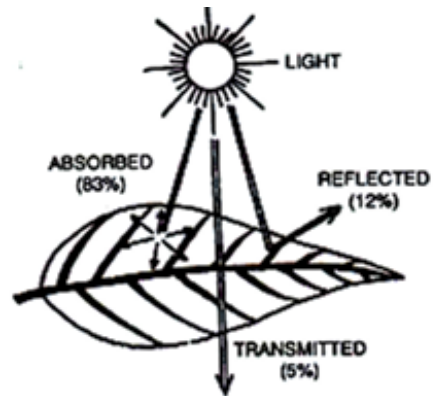


Photosynthesis

3 fates of light energy

1. Transmitted
2. Absorbed
3. Reflected



Photosynthetic Pigments

Each pigment absorbs a different range of wave lengths of light.

Photosynthetic Pigment	Wavelength of light absorbed
Chlorophyll a	Red and Blue
Chlorophyll b	All other wavelengths of light.
Carotenoids	

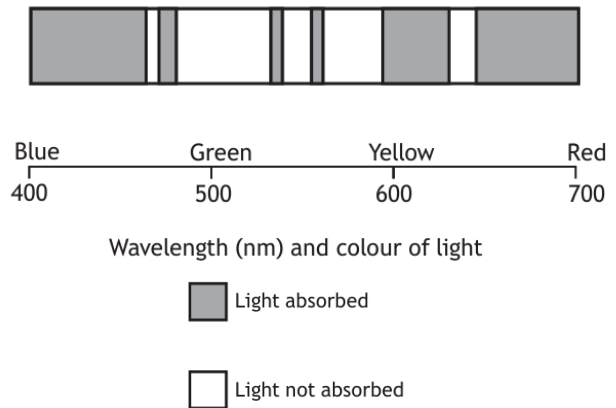
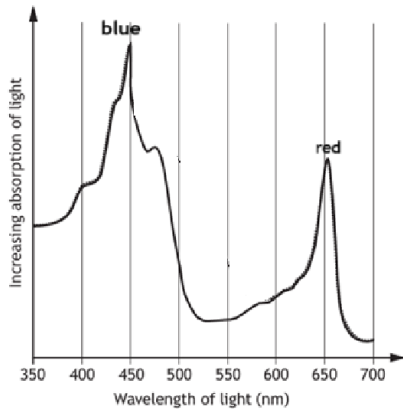
Function of carotenoids

To extend the range of wavelengths absorbed and pass the energy to chlorophyll for photosynthesis.

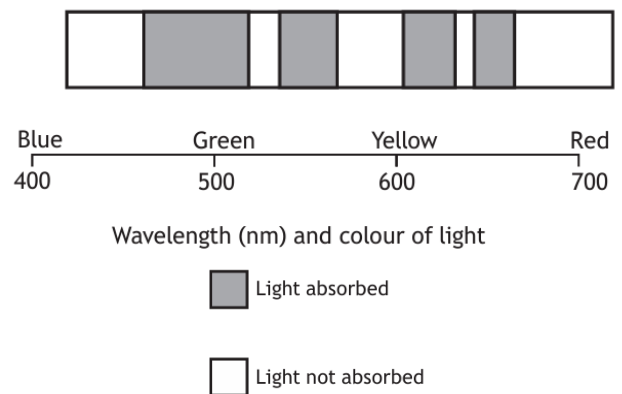
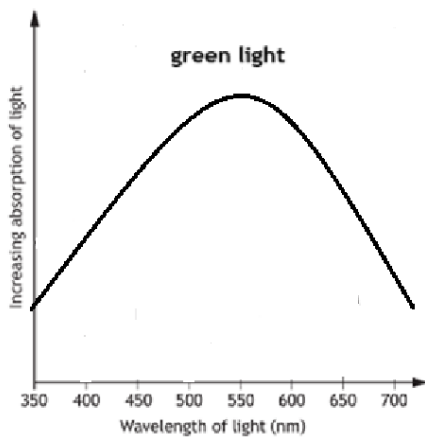
Photosynthesis

Absorption Spectrum

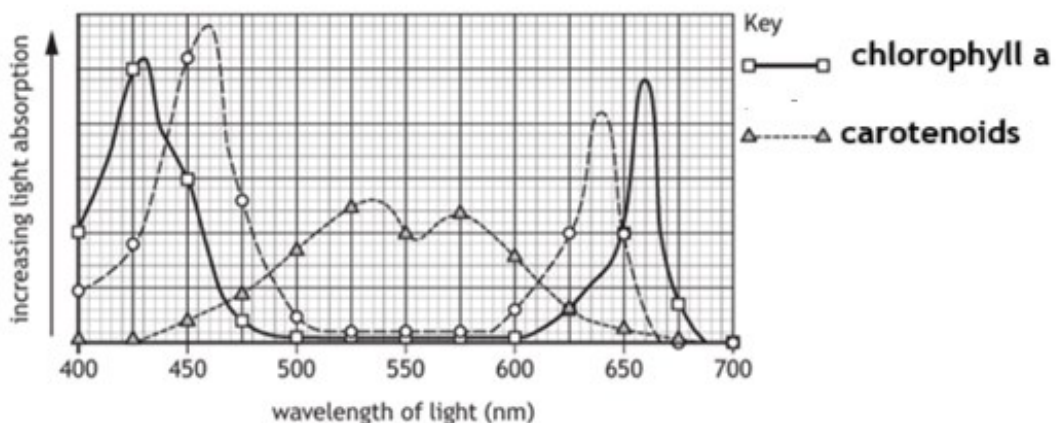
Chlorophyll a (red and blue light absorbed)



Carotenoids —mainly absorb **green/yellow light** NOT red/blue



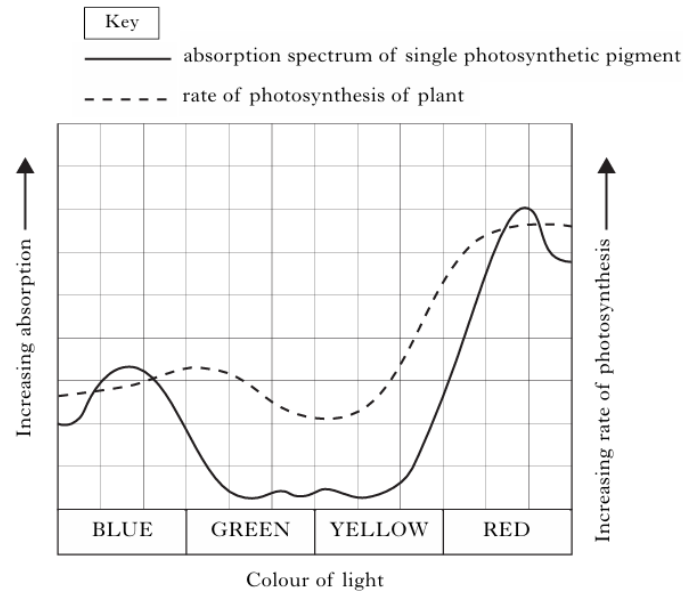
Carotenoids—**increase wavelengths/colours of light absorbed** OR broaden absorption spectrum



Photosynthesis

Action Spectrum

Plant photosynthesis' at colours other than red and blue due to role of cartenoids broadening wavelengths of light absorbed for photosynthesis.



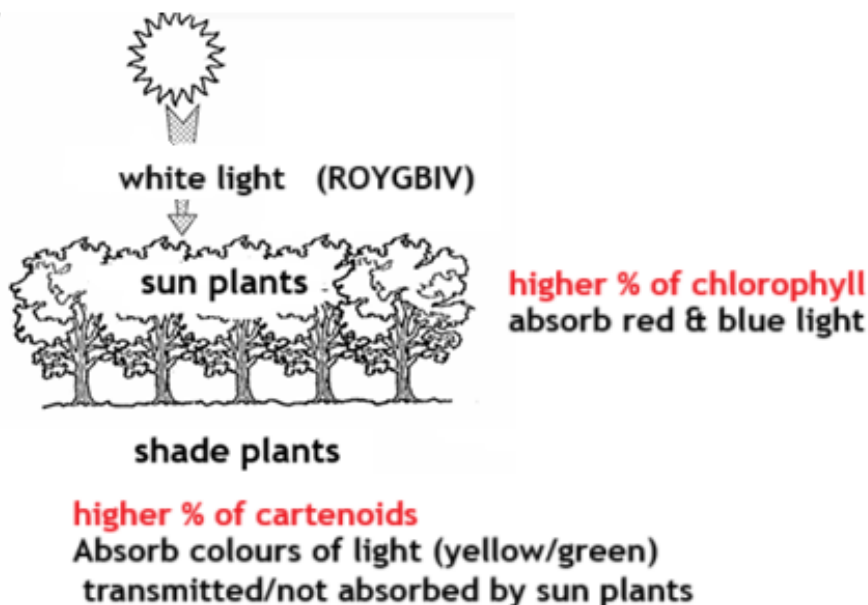
Sun plants

High percentage of chlorophyll a and absorb mainly red and blue light.

Shade plants

Grow below sun plant and are blocked from red and blue light by sun plant absorbing these colours of light.

Shade plants absorb green light that is transmitted through sun plant and due to higher percentage of cartenoids

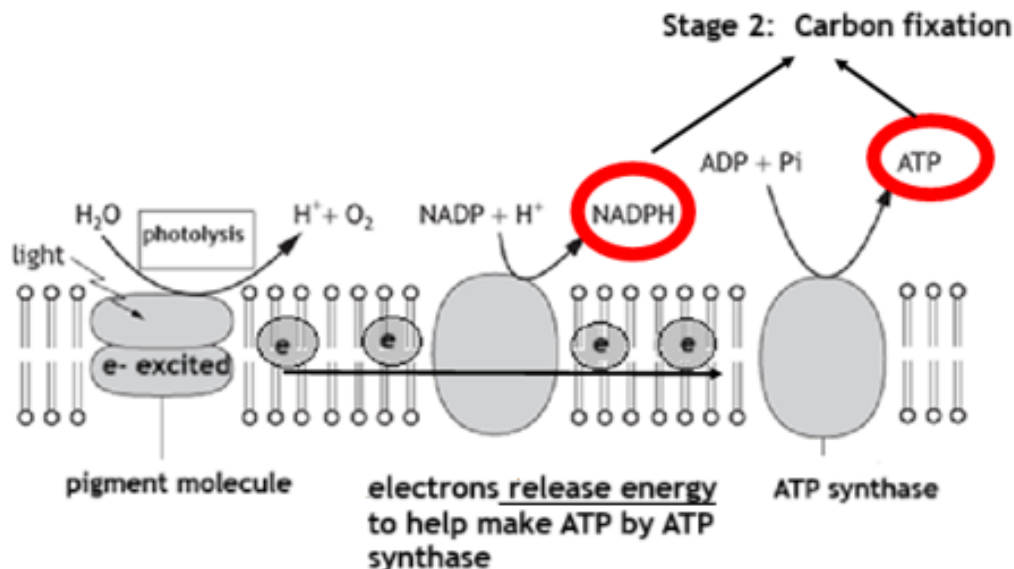


Photosynthesis

Light Dependent Stage

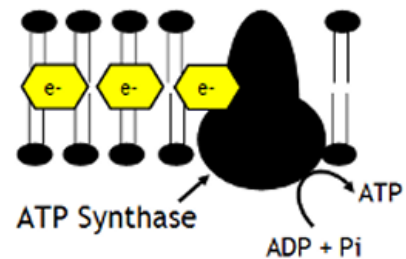
Light absorbed by photosynthesis causes two reactions to occur in the light dependent stage:

1. Generate ATP through the Election Transport Chain
2. Split water during Photolysis



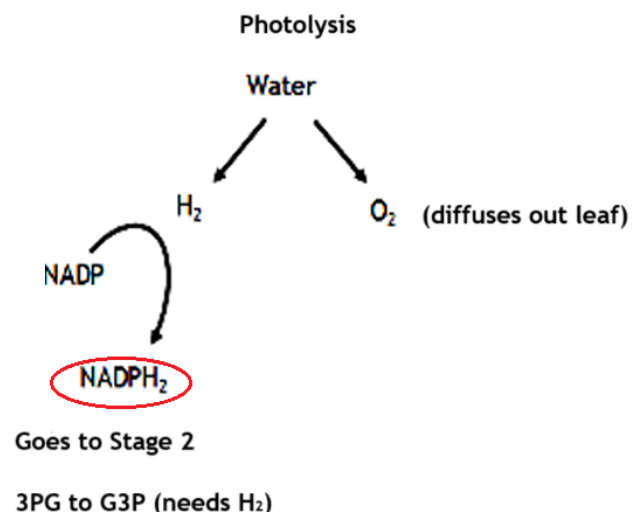
Electron Transport Chain

1. Absorbed light energy excites electrons in the pigment molecule.
2. The electrons are transferred through the electron transport chain.
3. They release energy to generate ATP by ATP synthase.



Photolysis

1. Light energy is used to split water.
2. Oxygen is released as a by-product.
3. Hydrogen ions are transferred to the coenzyme NADP to form NADPH.



Photosynthesis

Carbon Fixation

1. The enzyme RuBisCO fixes CO_2 by attaching it to RuBP (ribulose biphosphate).
2. This produces 3PG (3-phosphoglycerate).
3. 3PG is phosphorylated by ATP and combined with H_2 from NADPH_2 to form G3P.
4. G3P either regenerates RuBP or synthesises glucose.

