## Chapter 3 – Photosynthesis

## How is the plant leaf adapted to carry out photosynthesis?

- Large surface area greater area to catch light
- Arrangement of leaves which minimises overlap
- Transparent cuticle to allow light through • to the mesophyll cells
- Mesophyll cells packed with chloroplasts ٠
- Numerous stomata for gaseous exchange •
- Air spaces in the lower mesophyll to • allow diffusion of oxygen and carbon dioxide



Xylem networks which carry water to the leaf cells and phloem to carry away sugars to the rest of the plant e.co.uk

## What are the main stages of photosynthesis?

- 1. Light energy is captured by the chlorophyll in chlored
- 2. Light-dependent reaction light energy used in Motolysis of water and to excite electrons in chlorophyll - predices reduced NAPD, ATP and oxygen
- CO<sub>2</sub> and protons combine to produce sugars and 3. Light-independent reaction rganic



Oxidation is the loss of electrons, loss of hydrogen or gain of oxygen.

Reduction is the gain of electrons, gain of hydrogen or loss of oxygen.

## How is ATP made during the light-dependent reaction?

- A chlorophyll molecule absorbs light energy which excites 2 electrons, causing them to leave the chlorophyll as they are raised to a higher energy level (oxidation)
- These free electrons are taken up by an electron transport chain in the thylakoid membrane, which passes the electrons down subsequent lower energy levels along the chain in a series of reduction-oxidation reactions
- The energy given out by the electrons is used to form ATP from ADP and Pi

What is the role of photolysis in the light-dependent reaction?