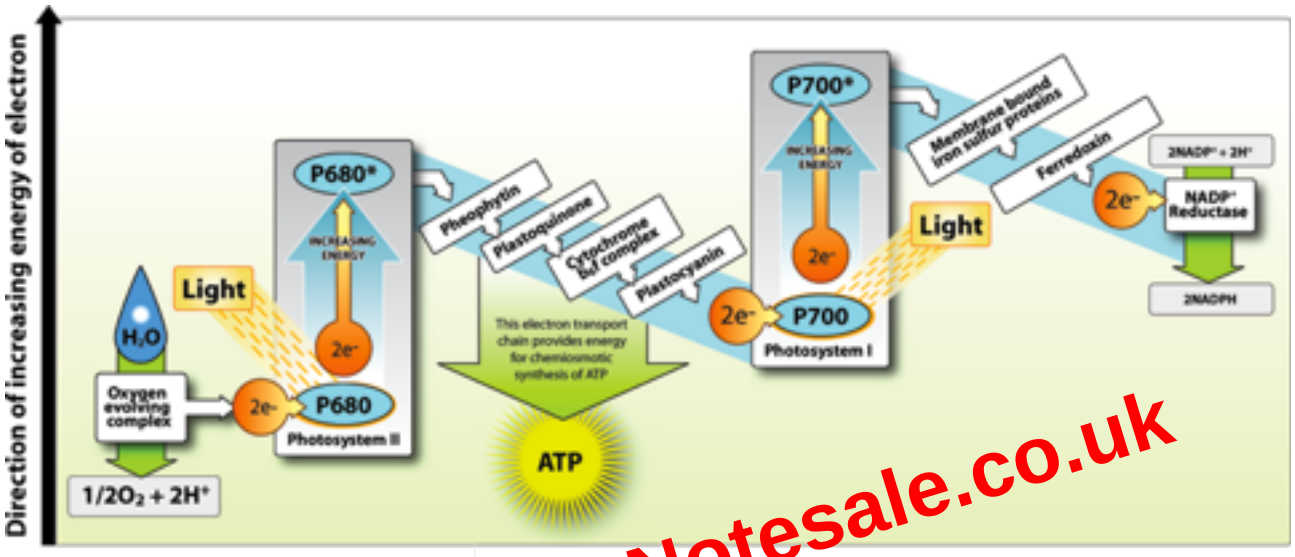
$$6CO_2 + 6H_2O \xrightarrow[\text{light}]{} C_6H_{12}O_6 + 6O_2$$

Light-dependent reaction



1. Photolysis of water
   - $H_2O \rightarrow 2H^+ + 2e^- + 1/2O_2$
   - The electrons replace the electrons lost when light hits photosystem II
2. Light energy is absorbed by photosystem II which excites a pair of electrons to a higher energy level and leave the chlorophyll molecule
3. The electrons are absorbed by an **electron carrier** and is passed down successive lower energy level electron carriers (electron transfer chain on thylakoid membrane)
4. The electrons lose energy as they are passed down and this energy is used to combine inorganic phosphate and ADP to form ATP.
5. The electrons reach photosystem I replacing the 2 electrons it excites to a higher energy level electron carrier when it absorbs light energy
6. The electrons are passed down further successive lower energy electron carriers
7. The H^+ ions from the photolysis of water and electrons are taken up by an electron carrier called **NADP** which then becomes reduced to **reduced NADP**.
8. The oxygen by-product is either used in respiration or diffuses out of the leaf as a waste product.