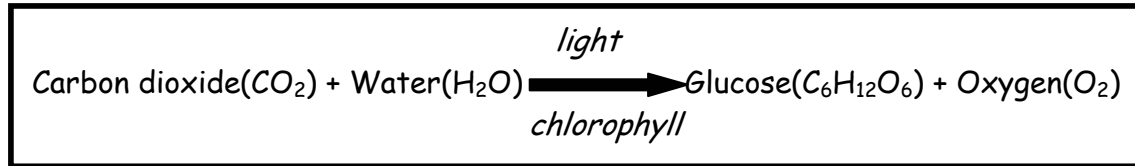


Intermediate 2 Biology  
Chapter 5 - Photosynthesis Revision Notes

### Photosynthesis

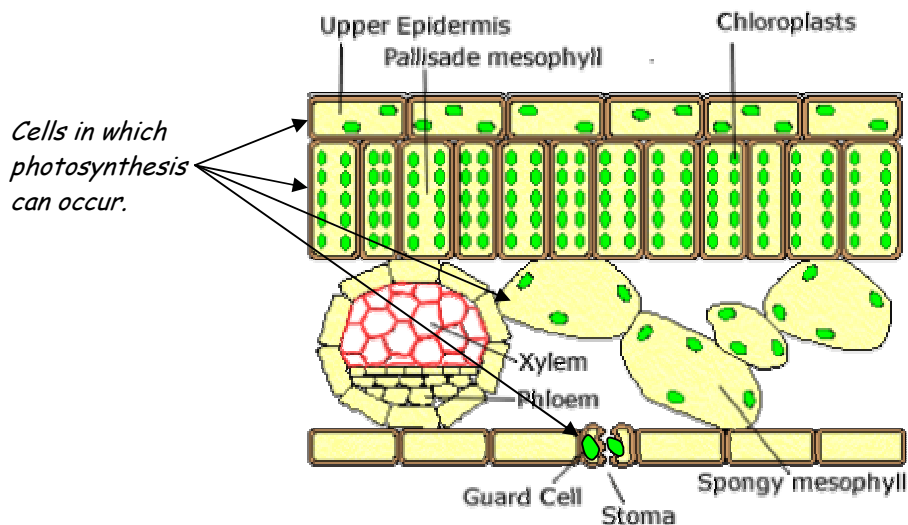
Photosynthesis is the process by which plants convert light energy into chemical energy. This involves the capture of light energy by chlorophyll. Chlorophyll is a green pigment found in chloroplasts. Photosynthesis can be summarised as follows:



### Photosynthesis and Diffusion

Diffusion is important in the process of photosynthesis as it allows carbon dioxide to enter photosynthetic cells and for oxygen to move out of these cells once photosynthesis has occurred.

There are several types of cells found in a leaf. Photosynthesis can occur in any cell which contains chloroplasts. You may be asked to identify (from a diagram) the cells in which photosynthesis can occur.



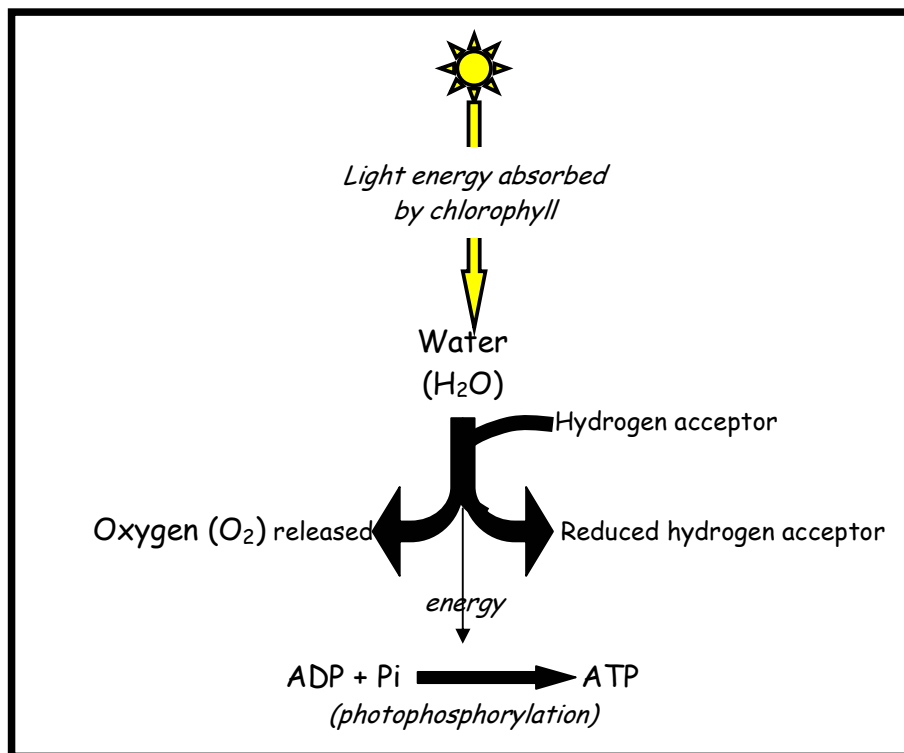
## Biochemistry of Photosynthesis

Although the summary equation of photosynthesis is useful it does not give any detail about the individual reactions which occur during photosynthesis.

Photosynthesis occurs in two stages. Stage 1 is called photolysis and stage 2 is called carbon fixation.

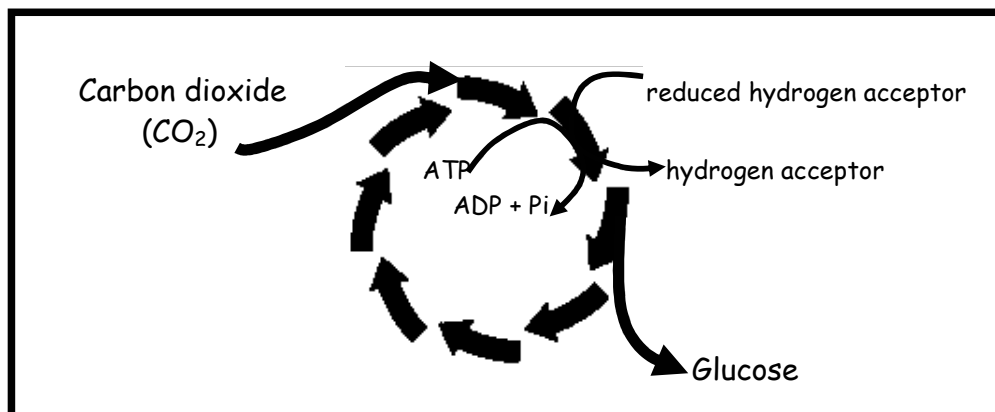
### Photolysis

During photolysis light energy is used to split water into hydrogen and oxygen. The hydrogen produced becomes bound to a hydrogen acceptor, whilst the oxygen diffuses out of the leaf and into the atmosphere. The splitting of water also releases energy which is used to form ATP.



### Carbon fixation

During carbon fixation carbon dioxide is converted into glucose in a series of reactions. Carbon fixation requires the ATP and the reduced hydrogen acceptor formed during photolysis.



## The Three Fates of Glucose

The glucose which is produced during carbon fixation can be used in three ways:

- 1) broken down during respiration to produce energy for growth and reproduction
- 2) converted into starch (a storage carbohydrate) which acts as an energy store
- 3) converted into cellulose (a structural carbohydrate) which cell walls are made from

## Limiting Factors

A limiting factor is one that *limits* how fast a reaction can go. Several environmental factors affect the rate of photosynthesis. Three which you need to know are:

- 1) light intensity
- 2) carbon dioxide concentration
- 3) temperature