



# PROCESSES IN PLANTS

Domain: 4.8  
describes features of living things

## Metabolism in Plants

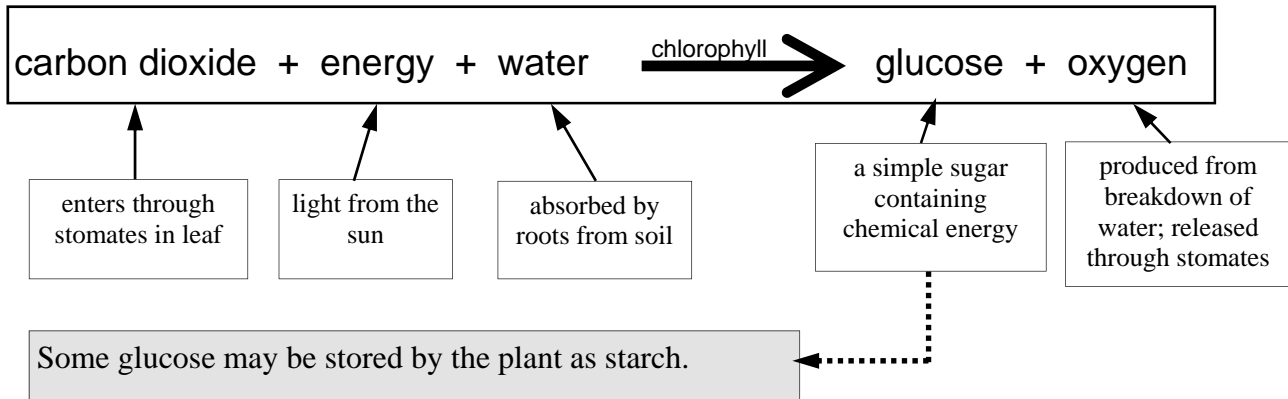
Green plants are **autotrophic**. This means they can manufacture their own food. During the manufacture of food many chemical changes take place. All these chemical changes are called the **metabolism** of the plant.

## Photosynthesis

Photosynthesis is the most important chemical reaction on earth. In photosynthesis, plants absorb light energy and change it into chemical energy. This chemical energy is in the glucose produced.

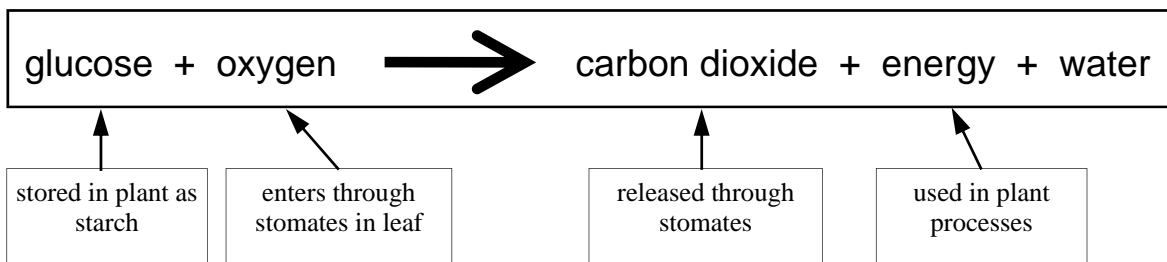
Photosynthesis occurs in special cells which have **chloroplasts**. The green pigment **chlorophyll** is present in these **chloroplasts**.

The process of photosynthesis is summarised below:



## Respiration

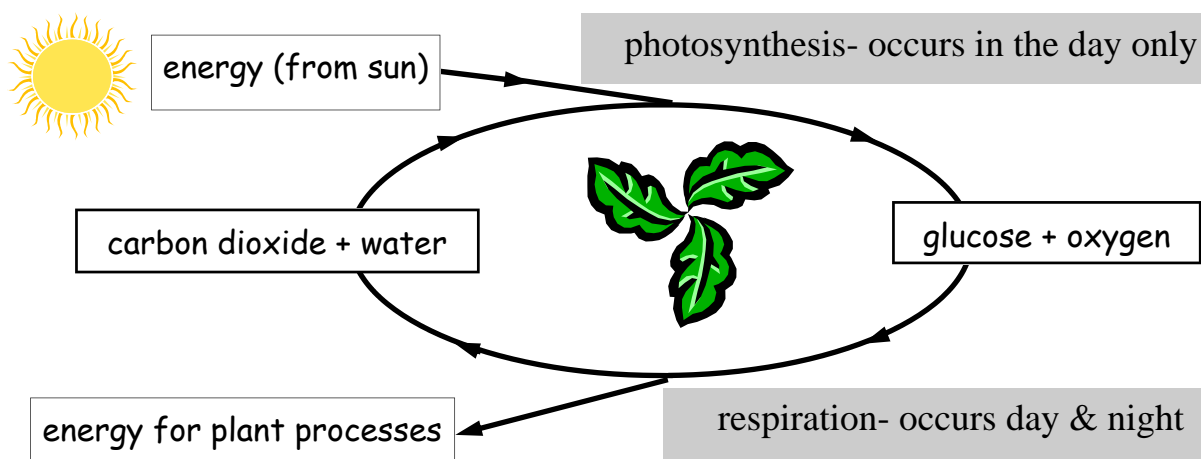
A plant requires energy to do all the **work** connected with living and growing. Respiration provides this energy. The process of respiration is summarised below:



\* Respiration occurs in every **living** cell in the plant.



## The Cycle of Photosynthesis and Respiration in Plants



### Transpiration

A plant obtains its water from the soil. More than 90% of the water that enters the roots is given off into the air as water vapour. The water molecules are linked in a long chain up through the xylem tissue from the roots to the leaves. The water evaporates into the atmosphere through the stomates. As a molecule is lost it pulls the next molecule up behind it and so on. This process is called **transpiration**. The plant retains any water it requires for plant processes. When the water moving into a leaf drops below a critical point, the stomates close so that the evaporation of water is limited. This also limits photosynthesis, as carbon dioxide cannot enter the leaf.

#### Questions:

1. What are all the chemical changes that occur in a plant called?
2. (a) Where does photosynthesis take place in a plant?  
(b) Give the word equation for photosynthesis.  
(c) What is the energy source for photosynthesis?  
(d) What type of energy is the light energy changed into?  
(e) What does the plant store glucose as?  
(f) What gas is used in photosynthesis?  
(g) What gas is produced in photosynthesis?
3. (a) What is the purpose of respiration in plants?  
(b) Give the word equation for respiration.  
(c) What is noticeable about the equations for photosynthesis and respiration?  
(d) Where does respiration take place in plants?
4. (a) When does photosynthesis occur in plants, day or night?  
(b) When does respiration occur in plants?
5. Outline the process of transpiration.

#### Transpiration occurs through a stomate:

