

### Photosynthesis

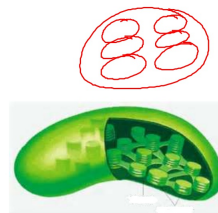
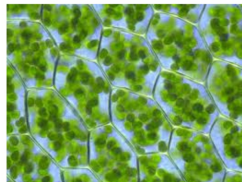
-is a process used by plants and other autotrophs to convert the light energy captured from the sun into chemical energy that can be used to fuel the organism's activities.

-It is the way in which plants make food!

-The food for plants is glucose/sugars/carbohydrates.

### Where does photosynthesis occur?

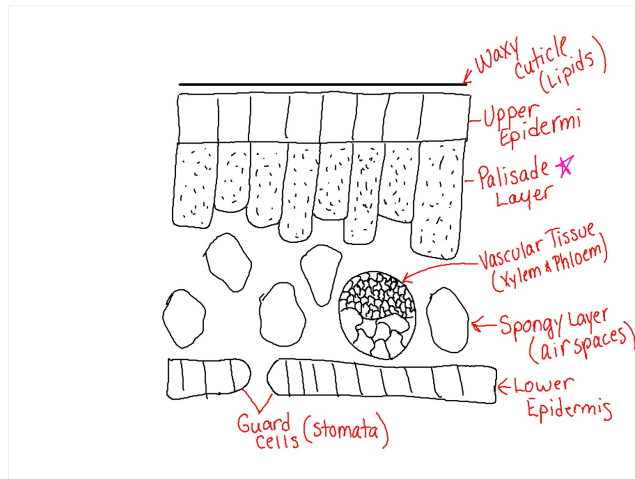
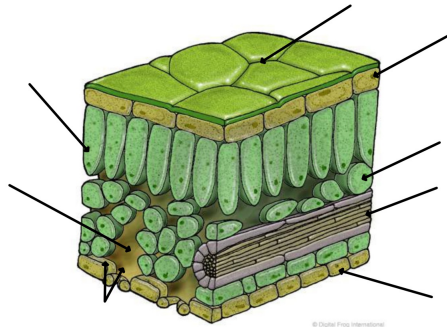
Photosynthesis takes place in the chloroplast.



The chloroplast is filled with a light absorbing pigment called chlorophyll.

## Leaf Structure

Chloroplasts are found in high concentration in the leaves of plants. This is where photosynthesis takes place in plants.



### Palisade Layer

- most photosynthesis happens here!

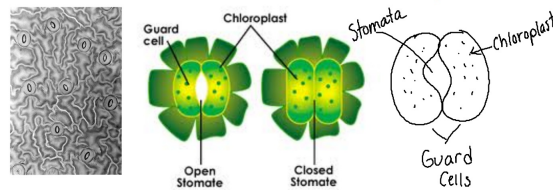
Structure:

- Closely packed cells (touching) - prevents any wasted sunlight.
- Located at the top of the leaf - where the sun hits.
- Lots of chloroplasts
- Large/long cells to increase surface area & light absorption

Xylem- carries H<sub>2</sub>O up  
Phloem- carries food down

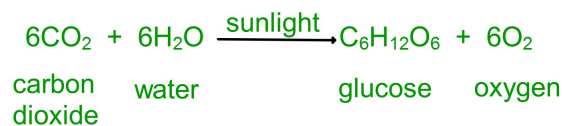
### Stomata

- The stomata is a tiny opening on the underside of the leaf.
- It opens and closes to allow gas exchange. (CO<sub>2</sub> in, O<sub>2</sub> out)
- It is controlled by two photosynthetic guard cells.



Transpiration- Process by which plants lose water through their stomata.

### The Formula:



Reactants= carbon dioxide, water, and sunlight

Products= glucose and oxygen (waste)

## Factors Affecting Photosynthesis

### 1) Light Intensity & Temperature

- As light intensity increases, photo. rates increases.
- As temperature increases, the rate of photosynthesis increases.
- If temperature increases too much the enzymes denature and photo. rates decrease.

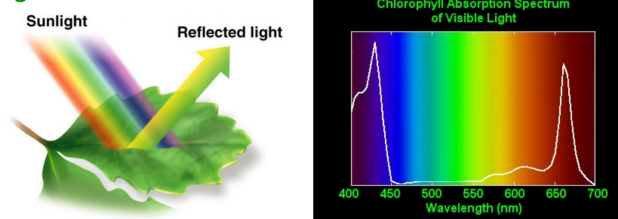
### 2) Carbon Dioxide Level

- As CO<sub>2</sub> levels increase, the rate of photo. increases.

### 3) Water

- As water levels decrease so does the rate of photo.

The chlorophyll in the leaf absorbs the light emitted by the sun. The most absorbed colors are blue and red. The most reflected is green. This is why when you look at a plant you see green.



Draw a picture of a leaf:

Draw the reactants for photosynthesis going in.  
Draw the products of photosynthesis leaving.

### Reactants of Photosynthesis

Reactants	How Obtained
Carbon Dioxide $\text{CO}_2$	$\text{CO}_2$ in the air (respiration/burning of fossil fuels) is taken into the stomata via diffusion. It is then stored in the air spaces of the spongy layer.
Water $\text{H}_2\text{O}$	It rains. The rain is taken in by the roots via osmosis. It is then carried up through the xylem to the leaf. Extra $\text{H}_2\text{O}$ then is excreted from the stomata in the process of transpiration.
Sunlight	The sun gives off white light (ROYGBIV). Green light is reflected & all others are absorbed by the chlorophyll.
Chlorophyll	Chlorophyll is a light absorbing pigment found in the chloroplast.