

# Year 8 Knowledge Organiser - Photosynthesis

## Key words:

**Chloroplast** – part of the cell where photosynthesis occurs

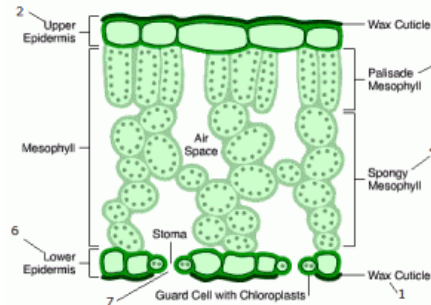
**Chlorophyll** – green pigment which absorbs light for photosynthesis

**Palisade layer** – layer of the leaf with the most chloroplasts

**Fertilisers** – substances containing minerals needed for plant growth

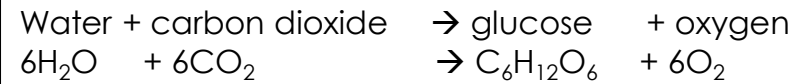
**Stomata** – tiny holes on the underside of leaves which allow carbon dioxide in

## Leaf structure



Palisade layer has the most chloroplasts to carry out photosynthesis. Stomata let carbon dioxide into the leaf. Upper epidermis allows light through. The whole leaf has a large surface area to absorb sunlight.

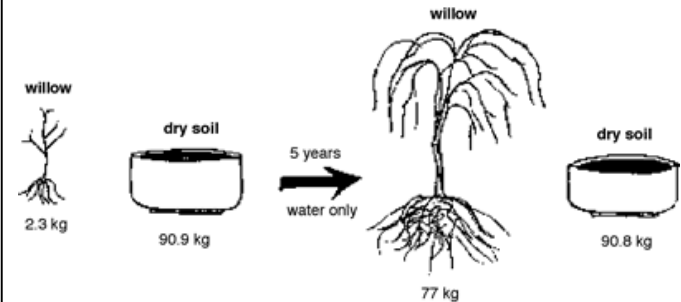
## Equation for photosynthesis:



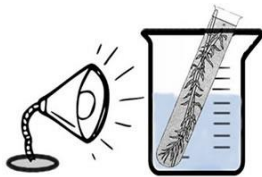
## Testing a leaf for starch

When plants photosynthesise they produce glucose which is changed into starch. Method: boil leaf for 5 minutes, then place in hot ethanol to decolourise. Spread on a white tile and cover with iodine – a black colour means starch is present.

## Van Helmont's experiment



## How can we measure the rate of photosynthesis?



Method 1 - shine a light on pondweed and count the bubbles of oxygen produced in a certain time. You can change the distance of the lamp from the pond weed. You must keep the temperature of the water the same.

## Websites that might be useful:

<https://www.bbc.com/bitesize/articles/zn4sv9q>  
<http://www.saps.org.uk/secondary/teaching-resources/797-video-clip-van-helmont>

## Extension ideas to research:

- How are pond lily leaves adapted to photosynthesise?
- Why do cacti have spines instead of leaves?

In 1634 Van Helmont planted a willow tree, and kept it for 5 years, giving it only water. The mass of the tree increased by 75kg but the mass of the soil went down by only 0.1kg. He concluded that plants gain mass from the water they absorb. We now know that actually most of the mass is gained by absorbing **carbon dioxide** from the air and turning it into other substances like **starch, cellulose** and **protein** to form new plant cells.