



ACTIVITY

TEACHER'S NAME	NAME OF THE ACTIVITY
Sarka	Photosynthesis
Time: 20-30 minutes Language level: Pre-Intermediate to Upper-Intermediate Language focus: vocabulary for photosynthesis Aim: Ss will understand the process of photosynthesis Ss will extend their knowledge of vocabulary Ss will read about the importance of plants	
Preparation:	Materials:
finding pictures of: a leaf, chlorophyll, chloroplast, starch	images of words, sugar
Procedure: - T asks if students like plants and what their favourite plant is - T pre-teaches vocabulary important to understand the lesson (leaf, absorb, chlorophyll, chloroplast, glucose, starch) - T demonstrates the process of photosynthesis by eliciting the steps from Ss with the help of easy to understand pictures - T checks understanding by asking Ss to draw the process of photosynthesis in pairs - as a follow-up activity Ss read about the importance of plants	

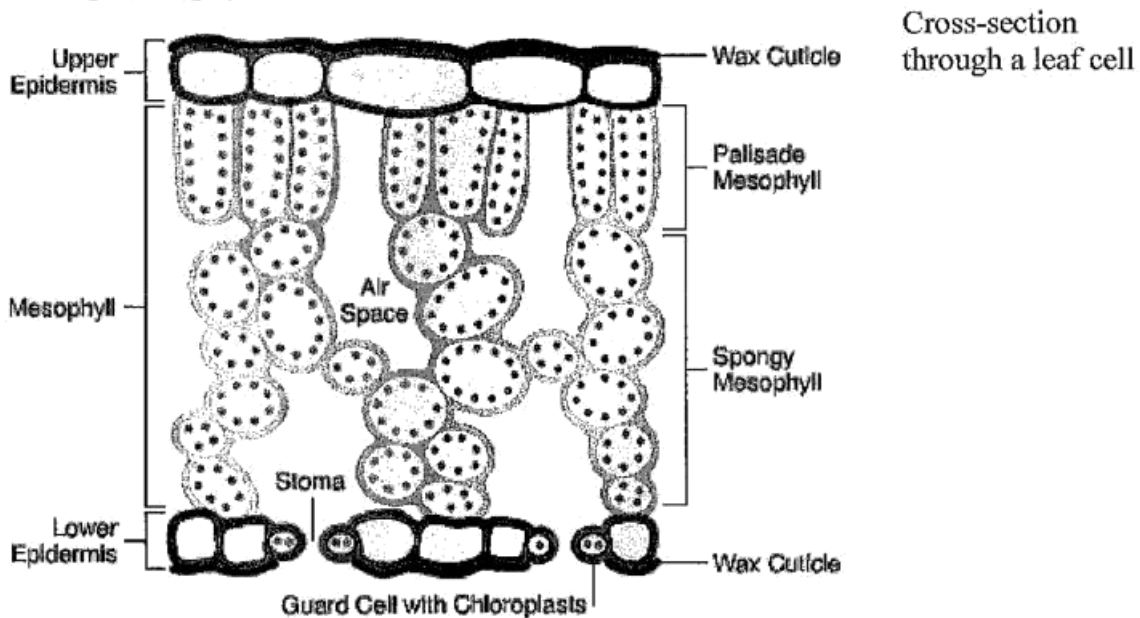


Photosynthesis

Photosynthesis is the chemical change which happens in the leaves of green plants. It is the first step towards making food - not just for plants but ultimately every animal on the planet.

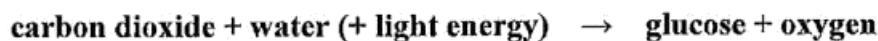
Green plants absorb light energy by a green substance called chlorophyll in their leaves. During this reaction, *carbon dioxide* (from the air) and water (from the soil) are converted into a sugar called glucose and *oxygen* with the help of absorbed light energy. This process is called photosynthesis.

Photosynthesis takes place in leaf cells. These contain chloroplasts, which are tiny objects containing chlorophyll.

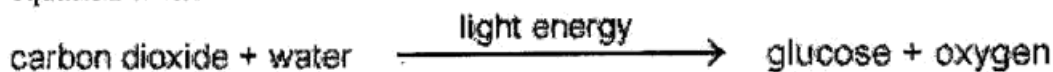


Plants also need mineral ions, including nitrate and magnesium, for healthy growth. They suffer from poor growth in conditions where mineral ions are deficient.

Here is the equation for photosynthesis:



'Light energy' is shown in brackets because it is not a substance. You will also see the equation written like this:

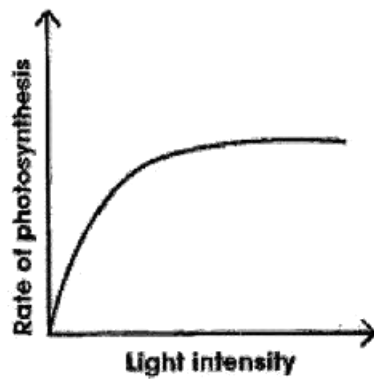


Plants absorb water through their roots, and carbon dioxide through their leaves. Some glucose is used for respiration, while some is converted into insoluble *starch* for storage. The stored starch can later be turned back into glucose and used in respiration. Oxygen is released as a by-product of photosynthesis.

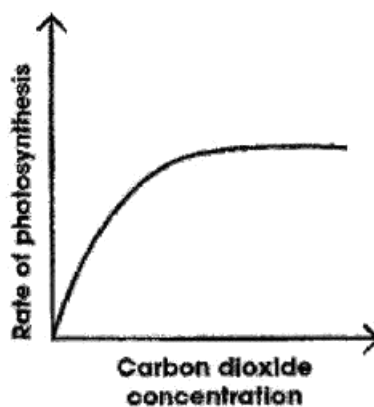


Factors limiting photosynthesis

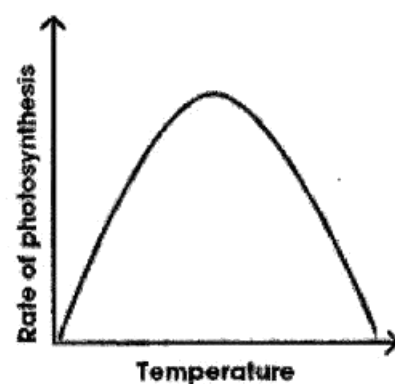
Three factors can limit the speed of photosynthesis - light intensity, carbon dioxide concentration and temperature.



Without enough light, a plant cannot photosynthesise very quickly, even if there is plenty of water and carbon dioxide. Increasing the light intensity will boost the speed of photosynthesis.



Sometimes photosynthesis is limited by the concentration of carbon dioxide in the air. Even if there is plenty of light, a plant cannot photosynthesise if there is insufficient carbon dioxide.



If it gets too cold, the rate of photosynthesis will decrease. Plants cannot photosynthesise if it



gets too hot.

If you plot the rate of photosynthesis against the levels of these three limiting factors, you get graphs like the ones above.

In practice, any one of these factors could limit the rate of photosynthesis.

Maximising growth

Farmers can use their knowledge of these limiting factors to increase crop growth in greenhouses. They may use artificial light so that photosynthesis can continue beyond daylight hours, or in a higher-than-normal light intensity. The use of paraffin lamps inside a greenhouse increases the rate of photosynthesis because the burning paraffin produces carbon dioxide, and heat too.

http://www.bbc.co.uk/schools/gcsebitesize/science/add_aqa_pre_2011/plants/plants1.shtml

you tube videos on photosynthesis:

<https://www.youtube.com/watch?v=g78utclQrJ4>



The importance of photosynthesis

Without plants, life as we know it would not exist on our planet. Green plants play a vital role in the following areas.

Atmospheric gases

During photosynthesis plants take in carbon dioxide and give off oxygen as a by-product. Photosynthesis can therefore be considered as the reverse of respiration. Without green plants performing photosynthesis there would be no way for nature to replace all the oxygen being consumed in processes such as respiration and combustion. Furthermore the levels of carbon dioxide in the atmosphere would increase. Thus, the balance of atmospheric gases is kept stable by photosynthesis.

Food

Green plants are called producers because they produce all their own food from the raw materials around them via photosynthesis. Animals and humans on the other hand are consumers and all the food they eat comes directly or indirectly from plants. Most of the world's population obtains more than 80% of their food directly from plants, for e.g. rice, potatoes, wheat, corn etc. The remaining source comes from animals and these animals are part of the food chain which always begins with plants.

Clothing

Many plants have cells which are long and thin with thick cell walls. These properties allow the cells to form fibres, which can be spun and woven into fabrics. Examples of these include the cotton plant used to make cotton and the flax plant used to make linen.

Medicines

Plants contain a vast range of chemicals which are extracted and used in the production of medicines. Aspirin the drug used as a pain reliever and to reduce blood clotting in heart patients is derived from salicylic acid, a chemical extracted from the bark of the willow tree. Much stronger pain killers (analgesic drugs) such as morphine and codeine are produced from opium, the dried sap derived from the seeds of the poppy plant.

To date the number of plants tested for medicinal properties number only in their thousands. There are still a vast number yet to be tested including many of the species sourced from the tropical rainforests. The unknown medicinal properties of these plant species adds to the importance of protecting natural habitats such as rainforests.

Wood

Wood for use as a building material, a fuel for combustion and in the manufacture of paper is sourced from trees.

Pesticides

Many plants produce chemicals as a defensive mechanism to protect them against attacks from pests. These chemicals can be extracted from the plants to produce natural pesticides to protect crops and plants.



<http://www.passmyexams.co.uk/GCSE/biology/importance-of-photosynthesis.html>