You need to know the content of this sheet. 100%

100% Sheet
Plant growth and photosynthesis

Ecosystems

Organisms require a supply of energy and materials for which they are often dependent on or in competition with other organisms

What's the BIG idea?

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.

During this reaction, *carbon dioxide* and water are converted into glucose and *oxygen*. The reaction requires *light energy*, which is absorbed by a green substance called chlorophyll.

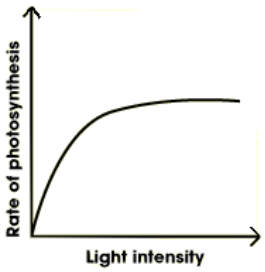
Photosynthesis takes place in leaf cells. These contain chloroplasts, which are tiny objects containing chlorophyll.

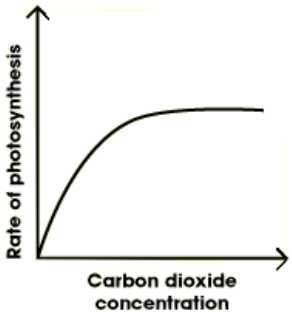
carbon dioxide + water $\xrightarrow{\text{light energy}}$ glucose + oxygen

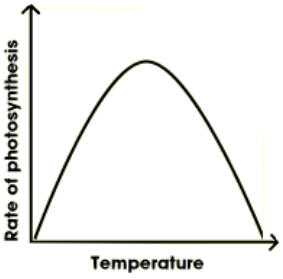
$6CO_2 + 6H_2O \rightarrow C_6H_{12}O_6 + 6O_2$

Limiting factors:

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.





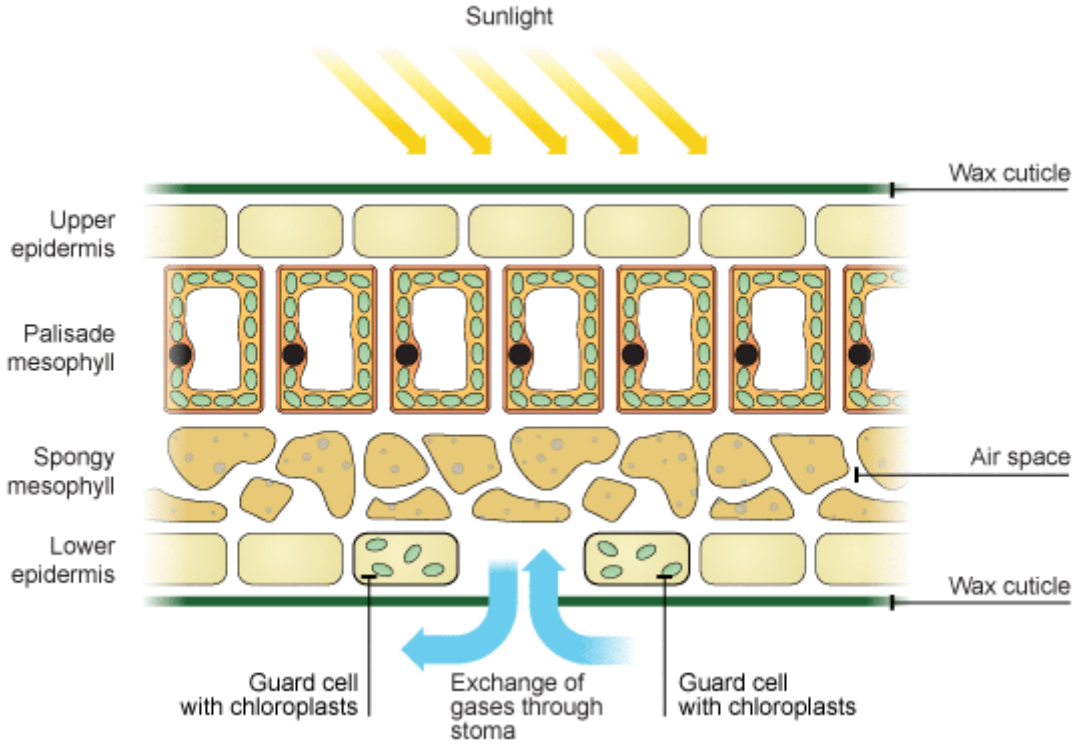


THIS PAGE HAS 2 SIDES

Leaf Adaptations:

Adaption	Purpose
Large surface area	To absorb more light
Thin	Short distance for carbon dioxide to diffuse into leaf cells
Chlorophyll	Absorbs sunlight to transfer energy into chemicals
Network of veins	To support the leaf and transort water and carbohydrates
Stomata	Allow carbon dioxide to diffuse into the leaf

Inside the leaf



Glucose and making the most of photosynthesis:

Plants use glucose for lots of functions:

Respiration, making fats and oils, making starch – a store of energy, making proteins (enzymes and hormones) and making cellulose for their cell walls.

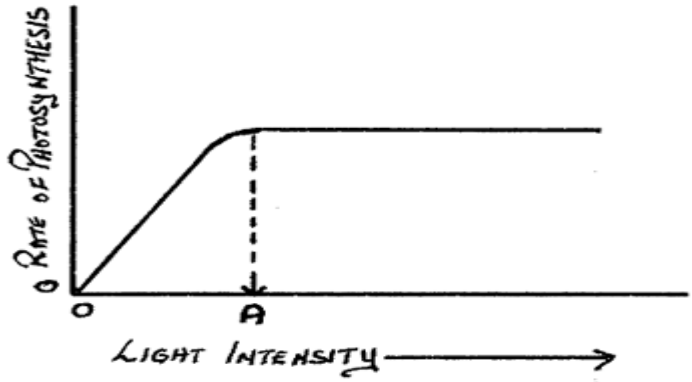
Making the most of photosynthesis:

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.

Write the word and balanced symbol equation for photosynthesis:

Explain what is meant by the term 'limiting factor' and give examples of these.

Describe and explain the graph:



List 4 ways in which the plant uses the glucose that it makes in photosynthesis:

Describe and explain how the structure of the leaf is adapted for its functions: