

Definitions and Concepts for WJEC (Wales) Biology GCSE

Topic 1.5: Plants and Photosynthesis

*Definitions in **bold** are for higher tier only*

Definitions marked by '' are for separate sciences only*

Active transport - The movement of particles from an area of low concentration to an area of high concentration, against the concentration gradient. This requires energy.

Aerobic respiration - A form of respiration that uses a plentiful supply of oxygen to release energy from glucose. It is shown by the following equation:



Cellulose - A carbohydrate which composes plant cell walls.

Chloroplasts - The organelles that are the site of photosynthesis. They contain chlorophyll (a green pigment) which absorbs light energy and important enzymes which are needed for photosynthesis.

Concentration gradient - The difference in concentration between two areas.

Endothermic reaction - A process which takes in energy, usually in the form of thermal energy.

Guard cells - Cells that control the opening and closing of the stomata.

Iodine solution - A solution used to test for the presence of starch. A colour change from brown to blue-black indicates a positive result.

Limiting factor - A factor that when in short or inadequate supply limits the rate of a reaction.

Lower epidermis - The bottom layer of the leaf which contains stomata for gaseous exchange.

Mitochondria - The organelle which is the site of aerobic respiration. It contains enzymes required for cellular respiration.

NPK fertilisers (Nitrogen, phosphorous, potassium fertiliser) - A fertiliser which artificially increases the soil's mineral ion concentration to prevent deficiencies.

Osmosis - The net movement of water molecules from a region of high concentration to a region of low concentration through a partially permeable membrane.

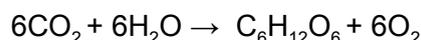
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Palisade layer - The layer of the leaf which contains the most chloroplasts so absorbs the most light for photosynthesis.

Phloem - A plant tissue that transports sugars from the source (parts of the plant producing sugars by photosynthesis) to the sink.

Photosynthesis - An endothermic reaction that takes place in the chloroplasts, converting carbon dioxide and water into glucose and oxygen using light energy. It is a two stage process.



Sunlight energy

Protein - A large molecule synthesised from amino acid monomers.

Root hair cells - Specialised cells that provide a large surface area for the uptake of water (by osmosis) and minerals (**by active transport**) from the soil.

Spongy mesophyll - A plant tissue which has air spaces for gaseous exchange.

Starch - A carbohydrate which is made up of many glucose molecules chemically joined together and is used as an energy storage molecule in plants.

Stomata - Small pores in the epidermis of the leaves that facilitate gas exchange. They can be open or closed to regulate transpiration and gas exchange.

Sucrose - A simple sugar which is transported via the phloem around the plant.

The inverse square law - **A law that explains the change of the rate of photosynthesis with distance from the light source. It states that the light intensity is inversely proportional to the square of the distance from the light source.**

Transpiration - The loss of water from the surface of the leaves by evaporation from the open stomata.

Turgid - When the vacuole of a plant cell becomes swollen and enlarged with water.

Upper epidermis - A transparent layer at the top of the leaf which allows light to reach the palisade layer.

Waxy Cuticle - A waxy layer on the leaf which protects against pathogens and reduces water loss.

Xylem - A specialised plant tissue that transports water and dissolved minerals from the roots to the leaves of the plant.

✦ Definition taken from: [WJEC \(Wales\) GCSE in BIOLOGY Specification V.2 January 2019](#)

