

Definitions and Concepts for Edexcel Biology GCSE

Topic 6: Plant Structures and Their Functions

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

Definitions marked by '' are for separate sciences only*

***Auxins** - A group of plant hormones that inhibit growth in plant roots and stimulate growth in shoot tips. They are involved in plant tropisms. Auxins are used in rooting powders and selective weedkillers.

Biomass - The total mass of organic material, measured in a specific area over a set period.

***Ethene** - A hormone that stimulates ripening in fruit.

***Gibberellins** - Plant hormones that regulate germination and flowering. They can be used commercially to control flower and fruit formation or to produce seedless fruits.

***Gravitropism** - A plant's growth response to gravity.

Guard cells - Cells that surround the stomata and change shape depending on the volume of water. They control the rate of transpiration by becoming turgid or flaccid, opening or closing the stomata.

Inverse square law - Light intensity is inversely proportional to the square of the distance from the light source:

$$\text{light intensity} \propto \frac{1}{\text{distance}^2}$$

Lignin - A material that strengthens the walls of xylem cells.

Limiting factor - A variable that limits the rate of a particular reaction.

***Lower epidermis** - A layer of cells on the leaf's lower surface that contains stomata and guard cells.

***Negative plant tropism** - The growth of a plant away from a stimulus.

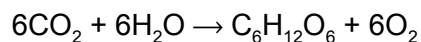
***Palisade mesophyll layer** - The main photosynthetic tissue in plants located below the upper epidermis. It receives the most light so contains the greatest concentration of chloroplasts.

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Phloem - A transport tissue found in plants that is specialised to transport sugars from the leaves to the rest of the plant in both directions.

Photosynthesis - An endothermic reaction that takes place inside photosynthetic organisms (e.g. plants, algae) and converts light energy into chemical energy. Overall:



***Phototropism** - A plant's growth response to light.

***Plant tropism** - The growth response of a plant to a stimulus.

***Positive plant tropism** - The growth of a plant towards a stimulus.

Producers - Photosynthetic organisms (e.g. green plants or algae) at the start of the food chain that provide biomass for all living things.

Root hair cells - Specialised cells responsible for the uptake of water and minerals from the soil. They have long hair-like extensions known as root hairs, which provide a large surface area for absorption.

***Rooting powders** - A powder containing auxins that stimulates the growth of roots in cuttings. This enables rapid plant cloning.

***Spongy mesophyll layer** - A type of loosely packed mesophyll tissue with air pockets which is specialised for gas exchange. It also contains some chloroplasts for photosynthesis.

Stomata - Small holes found on the surface of a plant that can be opened or closed by guard cells to control water loss and gas exchange.

Translocation - The movement of sugars (sucrose, amino acids, etc.) up and down a plant, from photosynthetic to non-photosynthetic tissues, via the phloem. Requires energy.

Transpiration - Water loss from plant leaves and shoots via diffusion and evaporation. The rate of transpiration is affected by light intensity, temperature and air flow.

***Upper epidermis** - A layer of transparent cells that allows light to strike the palisade mesophyll tissue.

***Vascular bundle** - Part of the transport system in vascular plants that consists of xylem and phloem tissue.

***Waxy cuticle** - A waxy layer that reduces water loss from the surface of leaves.

Xylem - A transport tissue in plants that is specialised to transport water and dissolved minerals from the roots of the plant to the leaves.

