

# Definitions and Concepts for WJEC (Eduqas) Biology GCSE

## Topic 2: Transport Systems

*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.

**Aorta** - The main artery that takes oxygenated blood away from the left ventricle of the heart to the body.

**Artery** - A blood vessel that carries blood away from the heart under high pressure.

**Atrioventricular valves** - Valves that prevent backflow of blood between the atria and the ventricles.

**Atrium (pl. atria)** - The upper chamber of the heart that receives the blood from the veins.

**Biconcave** - Describes the shape of red blood cells which increases the surface area for gaseous exchange.

**Bicuspid valve** - The valve on the left side of the heart that prevents backflow from the ventricles into the atria.

**Capillary** - The smallest type of blood vessels that connect the arteries and the veins. Exchange of substances between the tissues and the blood occurs in the capillaries.

**Cell membrane** - A selectively permeable barrier which controls the movement of substances into and out of the cell. It also has receptor molecules on the surface for cell-to-cell signalling.

**Companion cell** - Cells that aid the transport in the phloems by providing energy.

**Concentration gradient** - The difference in concentration between two areas.

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

**Diffusion** - The net spreading out of particles from a high concentration to a lower concentration (down their concentration gradient). Energy is not required, so it is a passive process.

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**Double circulatory system** - A circulatory system found in mammals in which the blood passes through the heart twice in a full body circuit.

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

**Haemoglobin** - A protein found in red blood cells which is responsible for carrying oxygen.

**Heart** - The organ that pumps blood around the body.

**Human circulatory system** - A system consisting of the heart, blood and blood vessels which circulates blood around the body.

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

**Lymphocytes** - Cells that make up white blood cells that produce antibodies and antitoxins when a foreign body enters the body.

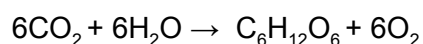
**Osmosis** - The net movement of water molecules from a region of high concentration to a region of low concentration through a partially permeable membrane.

**Palisade mesophyll** - A specialised plant tissue that carries out photosynthesis.

**Phagocytes** - Cells such as white blood cells that engulf and digest unwanted microorganisms in the blood via phagocytosis.

**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

**Plasma** - A pale yellow liquid found in the blood that carries water, enzymes, salts, nutrients, antibodies, urea and hormones.

**Platelets** - Cell fragments involved in the clotting of blood.

**Potometer** - A piece of capillary tube that is used to investigate the rate of transpiration. Water loss from the surface of the leaf is measured by the distance that the air bubble travels over a certain period of time.

**Pulmonary artery** - The main artery that carries deoxygenated blood away from the heart to the lungs.



**Pulmonary circulation** - A part of the circulatory system in which deoxygenated blood from the right side of the heart is transported to the lungs for gas exchange.

**Pulmonary vein** - The main vein that carries oxygenated blood back to the heart from the lungs.

**Red blood cells** - Cells in the blood that carry oxygen and remove carbon dioxide.

**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.

**Semi-lunar valves** - Valves found at the base of the aorta and the pulmonary artery. These valves prevent the backflow of blood from the arteries to the ventricles.

**Sieve tubes** - Plant cells that have no nuclei and are connected via the cytoplasm. These cells make up the phloem.

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

**Stomata** - Small pores in the epidermis of the leaves that facilitate gaseous exchange.

**Surface area to volume ratio (SA:V)** - The size of the object compared to the amount of area in contact with the environment. A high SA:V ratio is useful for exchanging substances.

**Systemic circulation** - A part of the circulatory system in which oxygenated blood is pumped from the left side of the heart to all the organs of the body for exchange.

**Translocation** - The process of transporting sucrose around the plant.

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

**Tricuspid valve** - The valve on the right side of the heart that prevents backflow from the ventricles into the atria.

**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.

**Valves** - Structures found at each end of both ventricles that prevent the backflow of blood (ensuring blood flows in only one direction).

**Vein** - A blood vessel that carries deoxygenated blood to the heart at low pressure.

**Vena cava** - The main vein that carries deoxygenated blood back to the right atrium of the heart from the body.

**Ventricles** - The lower chambers of the heart that receive blood from the atria and pump it to the arteries. The heart has two ventricles.



**Visking tubing** - An artificial membrane that is partially permeable; it is used as a model of living cell membranes to investigate the movement of water and solutes.

**White blood cells** - Cells of the immune system that protect the body from invading pathogens. They produce antibodies and antitoxins.

**Xylem** - A specialised plant tissue that transports water and dissolved minerals from the roots to the leaves of the plant. Xylem vessels are made up of dead cells.

✦ Definition taken from: [WJEC \(Eduqas\) GCSE in Biology Specification V.3 January 2019](#)

