

AQA GCSE Topic 1 Cell Biology – Transport in Cells Key Words

Key Word	Definition
Diffusion	The spreading out of particles from an area of higher concentration to an area of lower concentration. It is a random process caused by the movement of particles in gases and liquids. It is a passive process (no energy is required)
Diffusion through cell membranes	Dissolved substances and small molecules (e.g. oxygen, water, glucose and amino acids) can diffuse directly through cell membranes
Rate of diffusion	The rate of diffusion increases when there is a bigger concentration gradient (the difference in concentration of particles), a higher temperature (as the particles have more energy) and a larger surface area (as more particles can pass through)
Osmosis	The movement of water across a partially permeable membrane from a region of higher water concentration to an area of lower water concentration. This is the same as saying water moves from a more dilute solution to a more concentrated solution. It is a passive process (no energy is required)
Partially permeable membrane	A membrane with very tiny holes in it
Active transport	The movement of particles against a concentration gradient (from an area of lower concentration to an area of higher concentration), this requires energy (it's an active process)
Active transport in plant roots	Active transport is used to absorb plant minerals against their concentration gradient from a lower concentration in the soil to a higher concentration in the root (minerals are essential for healthy growth of the plant)
Active transport in humans	Active transport is used in the digestive system to absorb digested nutrients from the small intestine (e.g. amino acids, glucose) into the blood stream against their concentration gradient (this prevents us from starving)
Surface area:volume ratios	A ratio is how big one value is compared to another. The larger an organism is, the smaller its surface area:volume ratio
Multicellular	An organism made up of more than one cell e.g. plants and animals
Unicellular	An organism made up of one cell e.g. bacteria
Exchange surfaces	Exchange surfaces are needed for efficient diffusion in multicellular organisms. Exchange surfaces are usually thin, with a large surface area and a good blood supply to maximise diffusion
Alveoli	Tiny air sacs in the lungs, where gas exchange happens. They have a large surface area, thin walls

	and a good blood supply for efficient diffusion of gases
Gas exchange	The diffusion of oxygen from the alveoli into the blood stream and the diffusion of carbon dioxide from the blood stream into the alveoli
Villi	Tiny projections found on the inside of the small intestine, increasing the surface area for fast absorption of nutrients from the small intestine into the blood by diffusion or active transport
Stomata	Tiny holes found on the underside of leaves, for gas exchange (carbon dioxide diffuses into the leaf for photosynthesis, water vapour and oxygen can diffuse out of the leaf)
Guard cells	Found on either side of stomata, they control whether the stomata are open or closed. Closing the stomata can prevent the plant from wilting when too much water vapour is lost from the stomata
Gills	The gas exchange surface found in fish. Each gill is made of lots of thin plates call gill filaments (large surface area). The gill filaments are covered in tiny structures called lamellae (further increases the surface area). The lamellae are thin and have a good blood supply for efficient diffusion of oxygen from the water into the blood and carbon dioxide from the blood into the water. To maintain a large concentration gradient between the water and blood, blood flows through the lamellae in the opposite direction to water flowing over the lamellae so the concentration of oxygen in the water is always higher than in the blood for efficient diffusion