

# AQA Biology GCSE

## 1.3 - Transport in Cells

### Flashcards

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# What is diffusion?



# What is diffusion?

The net movement of particles from an area of higher concentration to an area of lower concentration.



What three main factors affect the rate of diffusion?



# What three main factors affect the rate of diffusion?

- Concentration gradient - larger gradient, faster diffusion.
- Temperature - higher temperature, faster diffusion.
- Surface area - larger surface area, faster diffusion.



Give examples of substances transported by diffusion in the lungs and the kidney



## Give examples of substances transported by diffusion in the lungs and the kidney

- Lungs: oxygen diffuses into the blood from the lungs and carbon dioxide diffuses into the lungs from the blood, both down their concentration gradient.
- Kidney: urea diffuses from cells into blood plasma so it can be excreted in urine.



# How are single-celled organisms adapted for diffusion?





How are single-celled organisms adapted for diffusion?

They have a large surface area to volume ratio - maximises the rate of diffusion of molecules to meet the organism's needs.



# How is surface area to volume calculated?



How is surface area to volume ratio calculated?

Surface Area = Number of Sides x (Side Length x Side Width)

Volume = Length x Width x Depth

Ratio = Surface Area:Volume



What four factors increase the effectiveness of a gas exchange surface?



# What four factors increase the effectiveness of a gas exchange surface?

- Large surface area
- Thin membrane (short diffusion path)
- Efficient blood supply (animals)
- Ventilation (animals)



# What is osmosis?



# What is osmosis?

The movement of water from a dilute solution to a concentrated solution through a partially permeable membrane.



What is meant when a solution is isotonic to a cell?





What is meant when a solution is isotonic to a cell?

The concentrations of the external and internal (inside cell) solutions are the same.



What is meant when a solution is hypertonic to a cell?



What is meant when a solution is hypertonic to a cell?

The concentration of the external solution is higher than that of the internal solution (inside cell).



What is meant when a solution is hypotonic to a cell?



What is meant when a solution is hypotonic to a cell?

The concentration of the external solution is lower than that of internal solution (inside cell).



What may happen when an animal cell is placed in a hypotonic solution?



What may happen when an animal cell is placed in a very hypotonic solution?

Water moves into the cell, causing it to burst.



What may happen when an animal cell is placed in a very hypertonic solution?





What may happen when an animal cell is placed in a very hypertonic solution?

Water moves out of the cell, causing it to shrivel up.



# How do plant leaves and stems remain rigid?



# How do plant leaves and stems remain rigid?

Turgor pressure - water moves in by osmosis, causing the vacuole to swell and the cytoplasm to press against the cell wall.



What may happen when a plant cell is placed in a very hypertonic solution?



What may happen when a plant cell is placed in a very hypertonic solution?

Water moves out of the cell by osmosis and the vacuole and cytoplasm decrease in size. The cell membrane may pull away from the cell wall, causing the cell to become plasmolysed.



# What is active transport?



# What is active transport?

The movement of molecules from a more dilute solution to a more concentrated solution against a concentration gradient, using energy from respiration.



# How do plant root hair cells use active transport?





# How do plant root hair cells use active transport?

Root hair cells use active transport to take up mineral ions from a more dilute solution in soils. Ions such as magnesium and nitrates are required for healthy growth.



How is active transport used to absorb the products of digestion?



## How is active transport used to absorb the products of digestion?

Active transport is used to transport glucose from a lower concentration in the gut to a higher concentration in the blood. Glucose is then transported to the tissues where it can be used in respiration.

