CAIE Biology IGCSE

3 - Movement In and Out of Cells

Flashcards

Define diffusion

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The net movement of molecules from an area of high concentration to an area of low concentration down their concentration gradient

Where does the energy for the movement of particles in diffusion come from?

Where does the energy for the movement of particles in diffusion come from?

From the kinetic energy of the particles that causes them to move in random directions

Why is the diffusion of gases important?

Why is the diffusion of gases important?

It allows for gas exchange in organisms to provide useful gases for processes like respiration and to remove waste gases

Why is the diffusion of solutes important?

Why is the diffusion of solutes important?

It is useful for the uptake of solutes from the soil in plants

How does temperature affect the rate of diffusion?

How does temperature affect the rate of diffusion?

As the temperature increases, so does the rate of diffusion as the particles have more kinetic energy and move faster

How does the concentration gradient affect the rate of diffusion?

How does the concentration gradient affect the rate of diffusion?

The greater the concentration gradient (the difference between the two areas), the faster the rate of diffusion

How does the surface area of the membrane affect the rate of diffusion?

How does the surface area of the membrane affect the rate of diffusion?

As the surface area increases so does the rate of diffusion as there is more space for the particles to move through

How does the diffusion distance affect the diffusion rate?

How does the diffusion distance affect the diffusion rate?

The larger the diffusion distance, the slower the rate of diffusion as the particles have further to move

Give one use of water in the body

Give one use of water in the body

Water is used as a solvent in the body

Give 3 processes in which water is used as a solvent

Give 3 processes in which water is used as a solvent

- Digestion
- Excretion
- Transport

What is osmosis?

What is osmosis?

The passive diffusion of water through a **partially permeable membrane**

Define osmosis
(Higher/Supplement)

Define osmosis (Higher/Supplement)

The net movement of water molecules from a high water potential to a low water potential across a partially permeable membrane

What is a hypotonic solution? (Higher/Supplement)

What is a hypotonic solution? (Higher/Supplement)

A solution that has a **higher** water potential than the water potential of the cell

What happens if you place an animal cell in a hypotonic solution? (Higher/Supplement)

What happens if you place an animal cell in a hypotonic solution? (Higher/Supplement)

There is a net movement of water **into the cell** which causes the animal cell to burst (lysis)

What happens if you place a plant cell in a hypotonic solution? (Higher/Supplement)

What happens if you place a plant cell in a hypotonic solution? (Higher/Supplement)

There is a net movement of water **into the cell** which causes the plant cell to become turgid (it does not burst because of the strong cell wall)

What is a hypertonic solution? (Higher/Supplement)

What is a hypertonic solution? (Higher/Supplement)

A solution that has a **lower** water potential than the water potential of the cell

What happens if you place an animal cell in a hypertonic solution? (Higher/Supplement)

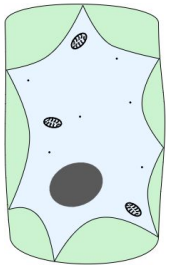
What happens if you place an animal cell in a hypertonic solution? (Higher/Supplement)

There is a net movement of water **out of the cell** which causes the animal cell to shrink (crenate)

What happens if you place a plant cell in a hypertonic solution? (Higher/Supplement)

What happens if you place a plant cell in a hypertonic solution? (Higher/Supplement)

There is a net movement of water **out of the cell** which causes the plant cell to become plasmolysed (the cell membrane peels away from the cell wall)



How is a plant cell supported?

How is a plant cell supported?

Water within the vacuole creates pressure which supports the cell. The cell wall also provides support.

Explain how the water in cells supports them (Higher/Supplement)

Explain how the water in cells supports them (Higher/Supplement)

The water creates turgor pressure which pushes the cell membrane against the inelastic cell wall

Define active transport

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The movement of molecules from a low concentration to a high concentration against their concentration gradient using energy from respiration

Give one use of active transport in humans (Higher/Supplement)

Give one use of active transport in humans (Higher/Supplement)

- Uptake of minerals and nutrients in the small intestine
- Reabsorption in the kidney

Give one use of active transport in plants (Higher/Supplement)

Give one use of active transport in plants (Higher/Supplement)

Uptake of minerals into root hair cells

Explain how active transport involves proteins (Higher/Supplement)

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Carrier proteins move substances from one side of the membrane to the other using energy