

DIFFUSION

The spreading out of particles from an area of higher concentration to an area of lower concentration.

- Happens in solutions and gases because their particles are free to move about randomly.
- The bigger the concentration gradient (difference in concentration) the faster the diffusion rate.
- Higher temperature causes higher diffusion rates because particles have more energy.
- Some substances can move in and out of a cell by diffusion.
- Only small molecules can diffuse through cell membranes e.g. oxygen, glucose, amino acids and water.
- Ions and proteins are too big to fit through the membrane.
- Particles flow through the membrane from a high concentration to a low concentration.
- The larger the membrane surface area the faster the diffusion rate because more particles can pass through at once.

ACTIVE TRANSPORT

ROOT HAIR CELLS

- Each branch of a root covered in millions of hairs, giving a large surface area for absorbing the ions, minerals and water needed for healthy growth. Mineral concentration is usually higher in root hair cells than in the soil so they cannot get diffusion.



- Root hair cells use active transport to take in minerals against the concentration gradient. However it requires energy from mitochondria to work.

HUMANS

- Active transport is used in the gut when there is a lower concentration of nutrients than in the blood.
- When there is a high concentration of glucose and amino acids in the gut they diffuse into the blood. However when there is a higher concentration of glucose and amino acids in the blood active transport must be used.
- It allows nutrients to be taken into the blood even though the concentration gradient is wrong.
- Glucose can be taken into the bloodstream even when its concentration in the blood is higher than in the gut.
- It can be transported to the for respiration.

OSMOSIS

The movement of water molecules across a partially permeable membrane from a region of high water concentration to a region of low water concentration.

- A partially permeable membrane has very small holes so only tiny molecules like water can get through.
- Water molecules move about randomly all the time so can pass through both ways.
- There's net flow of water to side with fewer water molecules e.g. stronger sugar solution (which becomes more dilute when more water flows over).

EXPERIMENT

- 1) Cut up potato into identical cylinders.
 - 2) Fill beakers with different concentrations sugar solutions. From highly concentrated (1g/ml) to pure water.
 - 3) Measure the mass of the potato cylinders. Then leave them in a beaker of solution for around 24 hours.
 - 4) Take them out dry them and weigh them.
 - 5) If their mass increased - water was drawn in. If their mass decreased water was drawn out.
- Independent variable: Sugar solution concentration.
Dependent variable: Potato mass.
- If some cylinders are not fully dry, then water could give a higher mass. Is water diffusing from beakers? Sugar solution concentration lowest in a cylinder.



Science Revision Year 9 Biology Notes

Michael Hoelscher



Science Revision Year 9 Biology Notes:

Unveiling the Magic of Words: A Review of "**Science Revision Year 9 Biology Notes**"

In a global defined by information and interconnectivity, the enchanting power of words has acquired unparalleled significance. Their ability to kindle emotions, provoke contemplation, and ignite transformative change is actually awe-inspiring. Enter the realm of "**Science Revision Year 9 Biology Notes**," a mesmerizing literary masterpiece penned with a distinguished author, guiding readers on a profound journey to unravel the secrets and potential hidden within every word. In this critique, we shall delve in to the book is central themes, examine its distinctive writing style, and assess its profound effect on the souls of its readers.

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