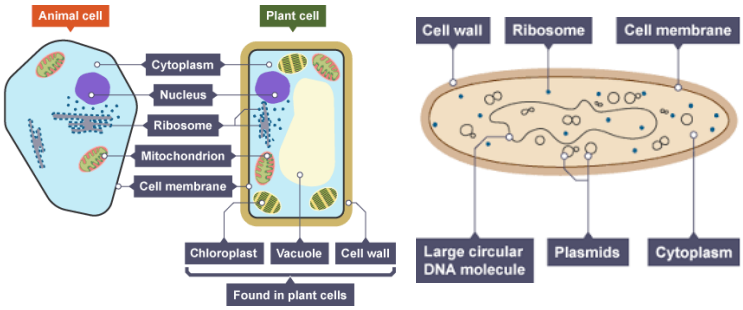
YEAR 9 GCSE Biology CORE KNOWLEDGE

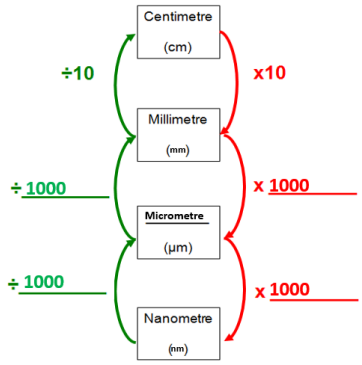
name:

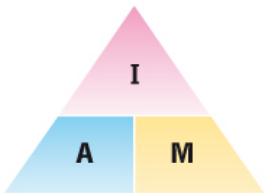
Eukaryotes **Prokaryote**



Organelle	Function
Nucleus	controls the activities of the cell.
Cell Membrane	controls the passage of substances into and out of the cell.
Cytoplasm	most of the chemical reactions take place here.
Vacuole	filled with cell sap.
Chloroplast	absorb light to make food by photosynthesis.
Cell Wall	strengthens the cell.
Ribosome	synthesise proteins.
Mitochondria	where aerobic respiration takes place to release energy from food.
Plasmid	a small loop of DNA in a prokaryote.

Electron Microscope	Light Microscope
More resolution	Less resolution
More magnification	Less magnification
Cumbersome	Easier to carry
B/W images	Color images





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Stem cells are cells that are **unspecialised**.
They can **differentiate** into different types of cell.
In humans, they can be found in the **embryo** and the **bone marrow**.
They can be used to treat **diabetes** or **paralysis**.
They can be used to create new organs in **therapeutic cloning**. These will not be **rejected** by the body.
There are chances of **viral infection** and some people object on **religious** or **ethical** grounds.

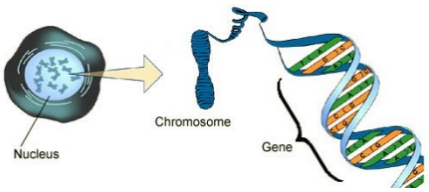
Cell	Specialisms
Sperm	Many mitochondria for energy; Tail for swimming
Muscle	contracts – to allow movement
Nerve	long – to send messages round the body.
Root Hair	large surface area – absorb water
Xylem	no cell contents – allows water to flow.
Phloem	no cell contents in tube – sugar flows.

Plant Stem Cells

Plant cells retain the ability to differentiate.

They can be used to create clones of rare plants or to produce many plants with the same special feature.

Genetic Information



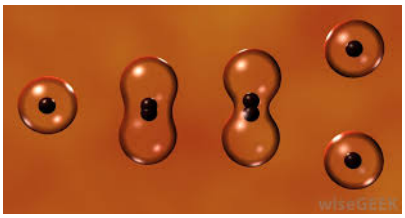
Genes are sections of DNA. They are found on chromosomes in the nucleus of the cell.

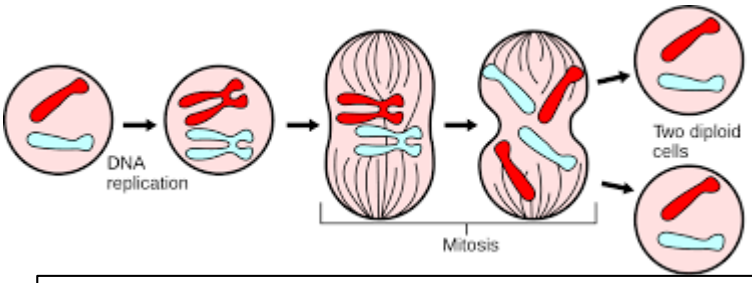
Chromosomes are found in pairs (we get one from each parent)

Mitosis

Mitosis is a form of cell division that produces **two genetically identical** daughter cells.

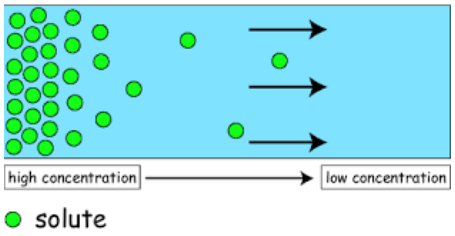
In humans, it is used for growth and repair of cells.





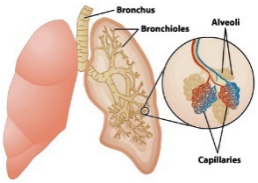
1. The DNA is **replicated**.
2. Chromosomes **line up** in the centre of the cell.
3. One set of chromosomes is **pulled** to each side of the cell.
4. The **nucleus divides**.
5. The **cytoplasm and membrane divides** to form 2 new cells.

Diffusion



Diffusion is the movement of particles from a high concentration to a low concentration.

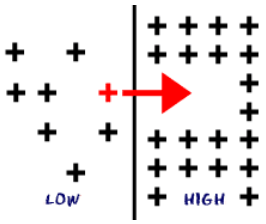
Substances such as **oxygen, carbon dioxide and urea** move in and out of cells via diffusion across the **membrane**.



Exchange surfaces in the body need to be adapted for **FASTER DIFFUSION**

1) They are folded for a **LARGE SURFACE AREA TO VOLUME RATIO.**
2) They are one cell thick so there is a **SHORT DIFFUSION DISTANCE.**
3) They have a good supply to maintain a **HIGH CONCENTRATION GRADIENT.**
4) They are usually warm so **PARTICLES HAVE MORE KINETIC ENERGY.**

Active Transport



Active Transport is the movement of particles from a low concentration to a high concentration.

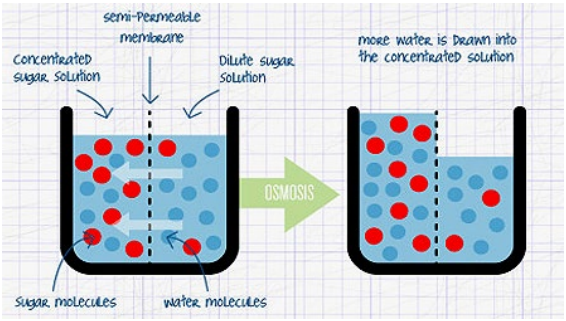
Active Trasport requires **ENERGY** released from **RESPIRATION.**

Examples of **Active Transport include:**

Mineral Ions being transported into roots**.**

Glucose being transported across the small intestines**.**

Osmosis



Osmosis is the diffusion of water from a dilute solution to a concentrated solution through a partially permeable membrane.

Partially Permeable means that small substances like water can cross but sugar cannot.

Osmosis can have dramatic effects on cells.