

1 IP SCGS Science - Cells

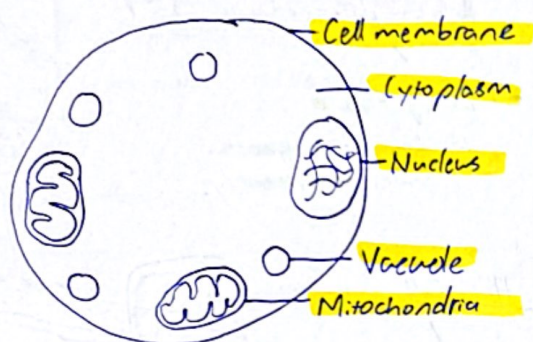
PARTS of a CELL

↳ Organelles

↳ Complex substance that carries out specific functions within the cell.

(BASICALLY what we call the cell parts.)

Animal Cell Organelles



Nucleus - Contains hereditary/genetic material (Deoxyribonucleic Acid) - chromosomes
→ Controls MOST cell activities within the cell, eg: growth/repair
→ Passes DNA on to next generation.

Cytoplasm - Gel-like fluid in which many organelles dissolved chemicals are found. (mainly made of water)
→ place where chemical reactions occur.

Cell membrane - Partially permeable membrane that allows only certain substances to pass through.
- Protects cell from surroundings, controls movement of substances in & out of cell.

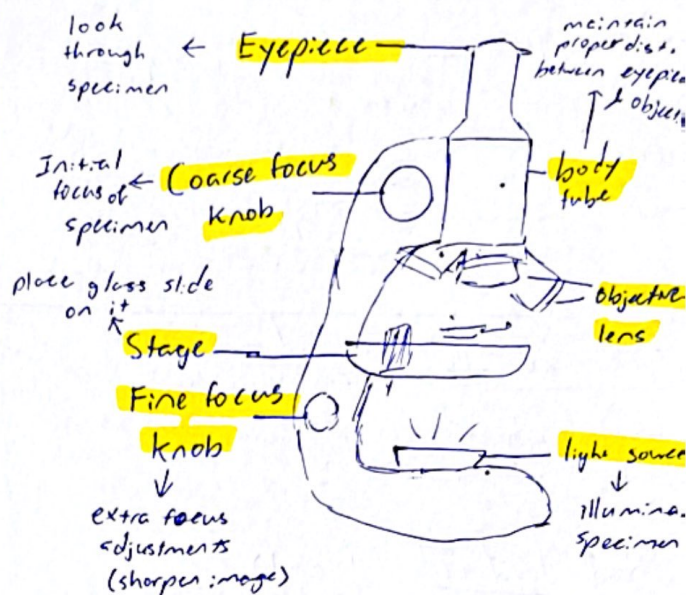
Vacuole - Stores liquids/food/waste in them
→ Animals: Multiple small vacuoles
→ Plants: One large central vacuole

Microscopes

→ Magnifies object by making it appear bigger than it actually is.

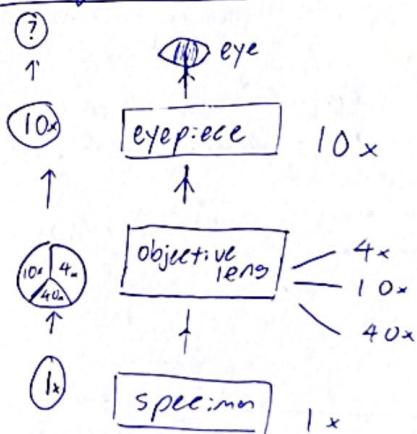
Light Microscopes

↳ Magnify objects up to 100x



Objective lens - Scanning lens (4x)
Low Power (10x)
High Power (40x)
magnifies specimen to different sizes.

Total magnification



Total magnification

$$= \text{magnification power of EYEPIECE} \times \text{magnification power of OBJECTIVE LENS}$$

eg. eyepiece
 $TM = 10 \times 4 \text{ (scanning lens)}$
 $= (40 \times) \text{ (total magnification)}$

Mitochondria - **RELEASES** energy (ATP) through **Respiration** (and nutrients)

↳ Converts Oxygen & nutrients into ATP.

--- Plants ---

Cell Wall - Gives cell structure/shape
made of cellulose - **Protection** from injury

Chloroplast - Contains Chlorophyll for **photosynthesis**.

Plant cell



Specialised Cells → Modified to carry out specific functions

↳ Have adaptations to help them perform their specific function

Red Blood Cell (Animal)

↳ Transports oxygen around the body from the lungs.

Adaptations:

→ **Biconcave shape:**

↳ **Increase surface area: volume**
(faster rate of diffusion of O_2 into the cell so that transport)

→ **No nucleus**

↳ Allow for **more space to store Haemoglobin** (binds w/ O_2)

→ **Contains Haemoglobin (Hb)**

↳ transport oxygen more efficiently.



Nerve Cell (Animal)

↳ transmits signals to the brain from different parts of body

→ **Long Fibre**

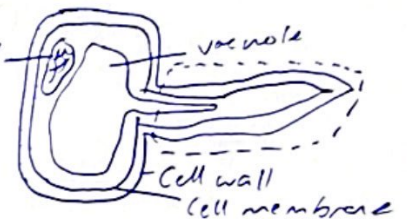
↳ transmit signals more efficiently.



Root Hair Cell (Plant)

→ **Elongated Structure**

↳ **Increase Surface Area: volume ratio**
(absorb more water/mineral salts)



Sperm Cell

↳ **Reproductive Purposes**

→ **Flagellum (tail)**

↳ move faster & more efficiently.



Organization of Cells → DIVISION OF LABOUR

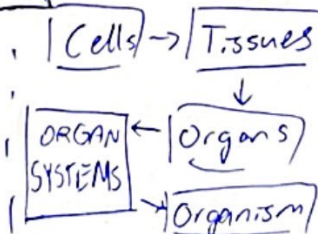
Cell: Basic unit of life

Tissue: Group of ^{similar} cells working together to perform a common function

Organ: A group of tissues working together to perform a specific function

Organ System: A group of organs coordinating to perform a common function

Organism: A group of systems working together to support a whole living organism.



Division of labour:

↳ Distribution of specific functions to different parts of an organism to be performed in a coordinated way.

Advantages: → multiple functions performed simultaneously (efficiency)
→ Smooth function of organism.