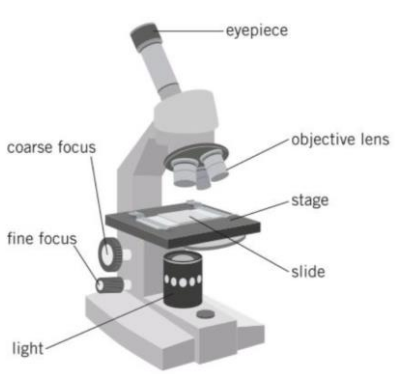
Knowledge organiser – 7.2 Cells & Tissues

OBSERVING CELLS USING A MICROSCOPE



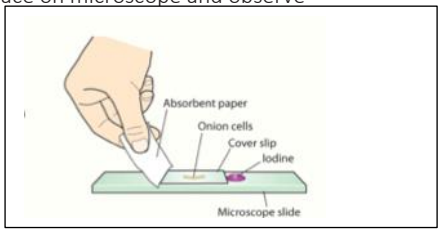
1. Move the stage to its lowest position.
2. Place the object on the stage.
3. Select the objective lens with the lowest magnification.
4. Look through the eye-piece and turn the coarse-focus knob slowly until you see the object.
5. Turn the fine-focus knob until the object comes into focus.
6. Repeat steps 1-5 with a higher magnification object lens to see the object in greater detail.

TOTAL MAGNIFICATION

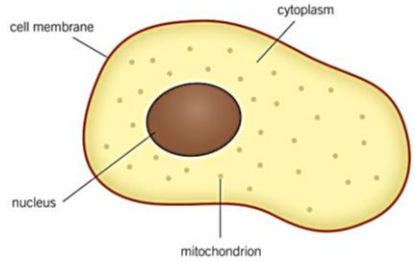
= Eyepiece lens magnification x objective lens magnification

PREPARING A SLIDE

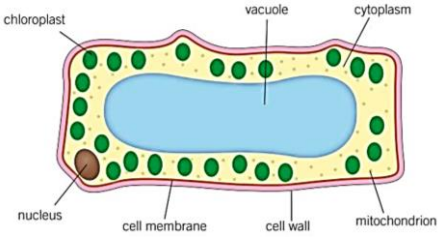
1. Place a thin section of the specimen on the slide
2. Add a drop of water or stain onto the centre
3. Carefully place a cover slip over the specimen without trapping air bubbles
4. Soak up any excess liquid with paper towel
5. place on microscope and observe



ANIMAL CELLS

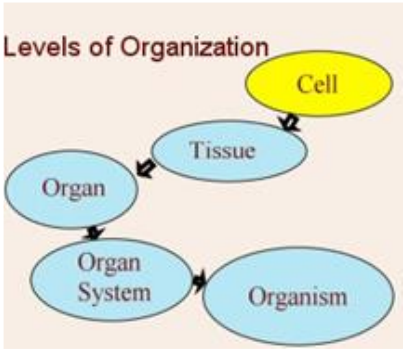


PLANT CELLS; Plant cells have *three extra* components; cell wall, vacuole and chloroplasts.



TISSUES & SYSTEMS

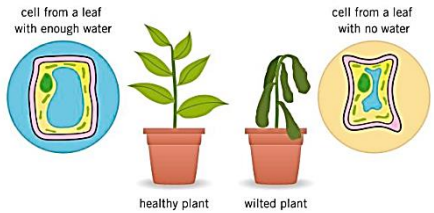
- When cells work together they make tissue
- An organ is a structure made up of a group of tissues
- Organ systems are organs that work together
- An Organism is made of organ systems and perform all 7 life processes
- MRS GREN
  - Movement
  - Respiration
  - Sensitivity
  - Growth
  - Reproduction
  - Excretion
  - Nutrition



Human Organ systems

- Skeletal
- Nervous
- Circulatory
- Muscular
- Respiratory
- Digestive
- Reproductive

If a plant does not have enough water, the vacuole shrinks. The cells become floppy and the plant wilts.

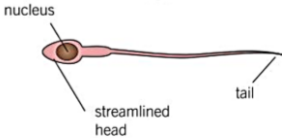


SPECIALISED CELLS; These cells have specific structural adaptations.

Nerve cell (neurone) → long and thin with connections at the end (to join to other nerve cells)

Red blood cell → contain haemoglobin – a red pigment which joins to oxygen. Disk-shaped with no nucleus to increase its surface area.

Sperm → Have a long tail and lots of mitochondria (movement towards the egg).



Root hair cell → root hair creates a large surface area to absorb water and nutrients from the soil.

KEYWORD	DEFINITION
Cell membrane	The cell component that surrounds the cell and controls movement of substances in and out.
Cell wall	The cell component that surrounds the cell and strengthens it. In plant cells it is made of cellulose.
Chloroplasts	The plant cell component that absorbs light so the plant can make food by photosynthesis.
Cilia	Ciliated cells have hairs called cilia that move
Cover slip	Thin piece of glass placed over specimen on slides
Cytoplasm	Jelly-like substance (in cells) where most chemical processes happen.
Leaf cells	The plant cells that contain chloroplasts, where photosynthesis takes place.
Microscope	An optical instrument used to magnify objects, so small details can be seen clearly.
Mitochondria	Part of the cell where glucose is broken down during the process of respiration, enabling energy transfer.
Nerve cells	An animal cell that transmits electrical impulses around the body.
Nucleus	The cell component that contains genetic material (DNA), which controls the cells activities.
Observation	Information gathered by your senses.
Red blood cells	An animal cell that transports oxygen around the body.
Respiration	A chemical reaction where food and oxygen are converted into water and carbon dioxide, enabling energy transfer.
Specialised cells	A cell whose shape and structure enable it to perform a particular function.
Sperm cells	Male sex cell containing male genetic information.
Stain	A chemical that helps show up cell structure
Structural adaptations	Special features to help a cell carry out its function.
Systems	A group of organs that work together e.g Heart and blood vessels
Tissue	Made from the same type of cell working together to perform a function
Vacuole	The cell component that contains liquid (cell sap), and can be used by plants to keep the cell rigid (firm) and store substances.