Living Things

Can you describe what living things are?

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1.1 Defining Life

(living and non-living things)

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Biology is the study of **living things**, e.g. animals and plants.

- **Organism=** is another name for a living thing.
- Living things have **7 characteristics**. (MR GERRN)

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7 characteristics of living things

MR GERRN

1. Movement
2. Respiration
3. Growth
4. Excretion
5. Reproduction
6. Response
7. Nutrition

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Movement

- All living things can move.
- It is easy to see animals move. Plants move too!
- However they stay rooted in one place.
  - Roots move through soil
  - Branches become longer
  - Flowers open out from bud


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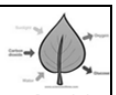
Respiration



- This is how living things **release energy** from their food.
- Living things **breakdown molecules** in their cells.
- Living things take in oxygen and combine it with food (in their cells) to make energy.
- When it happens in the presence of oxygen it is called **aerobic respiration**
- Oxygen + food ⟹ energy + carbon dioxide +water

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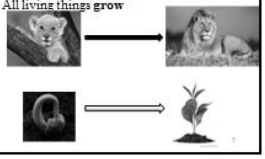
Growth

- All living things **grow**



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Excretion

- This means **getting rid of waste** from the body.
- Animal excrete **salt, water and carbon dioxide**.
- Plants produce wastes which are **stored in the leaves**. In autumn the leaves fall and the wastes are removed.


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Reproduction

- This means the production of new living things so that they don't become extinct.

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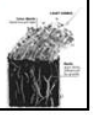
Response

- Living things react to changes in their environment
- Animals and humans use their senses to detect changes and react to **pain** or **noise**.
- Plants react to **gravity** and **light**.

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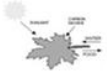
Nutrition

- This means the way in which living things **get and use their food**.
- All living things must have food to **survive**.
- Plants **can make** their own food.
- Animals **cannot make** their own food.





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Nutrition: Photosynthesis

- This is the **how plants make their own food**.

Carbon dioxide + water

⬇

Glucose (a sugar) + oxygen

Chlorophyll helps plants to **get the energy from sunlight**.

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Living
or
Non- living??

1.2 Cells and the Light Microscope

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Cells and the Light Microscope

- All organisms are made up of **cells**.
- Some organisms are a single cell only (**unicellular**). Other organisms are made up of millions of cells (**multicellular**).
- We can use a **light microscope** to look at magnified images of cells.

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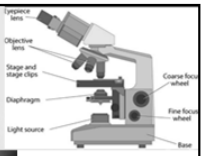
- The key parts of a **light microscope** are: eyepiece lens, stage and stage clips, diaphragm, objective lens, coarse and fine focus wheels and the light source.
- **Electron microscopes** have made it possible to see cells in even greater detail.



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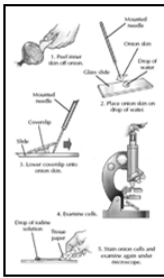
Part	Function
Eyepiece lens	Magnifies the image (usually X10)
Objective lens	Magnifies the image: low power – X4 medium power – X10 high power – X40
Nosepiece	Rotates so that different lenses can be used
Stage	Holds slide which contains object
Coarse adjustment	Rough focusing
Fine adjustment	Precise focusing
Mirror	Used to shine light source through slide



Examining Plant (Onion) Cells Under The Microscope

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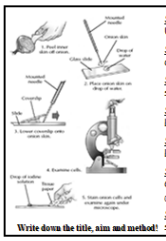


Step 1. turn on microscope. Use lowest objective lens.

Step 2. snap the piece of onion. Peel inner skin off onion

Step 3. place the onion on the slide carefully.

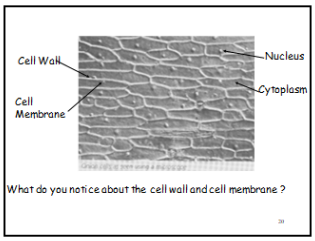
Step 4. add a drop of water. Let dry for 2 minutes.

Step 5. add a drop of iodine. Let dry for 2 minutes.

Step 6. lower the cover slip CAREFULLY onto the sample. (at an angle)

Step 7. View your prepared slide under the microscope.

Write down the title, aim and method!



What do you notice about the cell wall and cell membrane ?

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Magnification of a Microscope

Eyepiece lens X Objective lens = total magnification

Example:

Eyepiece = 10x

Objective lens = 4x

10 X 4 = 40 times bigger

Total Magnification

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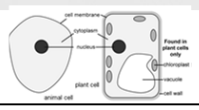
1.3 Structure of the Cell

- The structures within cells are **organelles**. Organelles are small structures that carry out specific roles within the cell.
- The three main organelles in both animal and plant cells are the cell **membrane, cytoplasm** and the **nucleus**.



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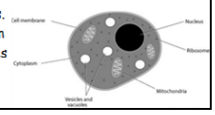
Animal Cell

An animal cell has the following parts.

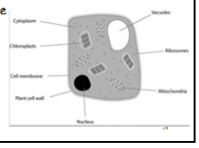
- A cell membrane.
- A nucleus.
- Cytoplasm
- Ribosomes
- Vacuole



Plant Cell

A plant cell parts.

- cell wall
- cell membrane
- nucleus
- cytoplasm
- Chloroplast
- vacuole



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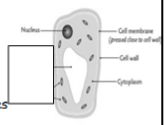
90%

Cell Membrane

- **Surrounds** and **supports** the cell
- It is like a border patrol.
- It controls what goes into and out of the cell.



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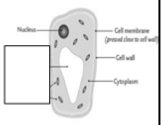
Nucleus

The nucleus is the **control centre** of the cell.

- It contains genes that **control inherited traits** / characteristics.
- The nucleus can **divide** into two identical nuclei.



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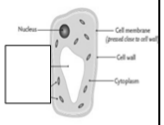
Cytoplasm

- Cytoplasm is a **fluid** found between the nucleus and the cell membrane.



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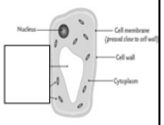
Vacuole

- It is found in the cytoplasm
- Animals have small vacuoles
- Plants have large vacuoles
- Contain mostly water



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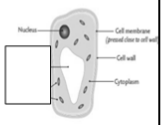
Cell Wall (only in plant cell)

- It is found outside the cell membrane.
- The cell wall gives a plant its structure i.e. acts like a skeleton for a plant body.



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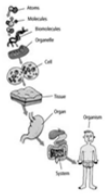
Part	Function	Key Word
Cell Membrane	Acts like thin skin - protects cell and controls what goes in and out of cell.	**THIN SKIN**
Cytoplasm	Watery fluid that fills the cell – holds cell's organelles.	**WATER**
Nucleus	Brain of cell, controls cell's activities	**BRAIN**
Cell Wall (PLANT ONLY)	Gives shape and support to cell.	**TOUGH SKIN**

1.4 Organisation of life



- Organisms are very organised.
- The levels of organisation are: **organelle, cell, tissue, organ, system** and **organism**.

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Tissue

- Tissues – a group of similar cells which carry out the same function.

Example: muscle (movement)

CELLS ➡ TISSUES

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Organ

is a structure that contains two or more tissues working together

CELLS ➡ TISSUES ➡ ORGANS

Example: The heart is an organ it has muscle to pump a good supply of blood around the body.

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Animal organs:

heart, lung, kidneys & brain.

Plant organs:

leaves, roots & flowers.

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A System

is a number of organs working together

CELL ➡ TISSUES ➡ ORGANS ➡ SYSTEMS

The sensory system: eyes, ears, nose, tongue and skin are all organs that make up this system.

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An organism

is a living thing.

We are organisms which rely on a number of systems working together to keep us alive.

Cells ➡ Tissues ➡ Organs ➡ Systems ➡ Organisms

Remember : This order CTOSO

Can Talk On Skype Online !!!!

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Organisms

- Organisms of the same species form a **population**.
- Populations of different species that live close together are a **community**.

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Comunities

- Communities interact with their physical environment to form an **ecosystem**.
- The study of ecosystems is called **ecology**.

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