B1: Cell Biology

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Content:

- 1. Cell
- 2. Microscopy
- 3. Cell differentiation and specialisation
- 4. Cell specialisation
- 5. Stem cells
- 6. Chromosomes and Mitosis
- 7. Diffusion
- 8. Osmosis
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- 10. Exchanging Substances

1- Cell:

Definition:

Cell is the basic building blocks of all livening things. Cell is the smallest unit that can't be seen from the naked eye.

► Types of Cell:

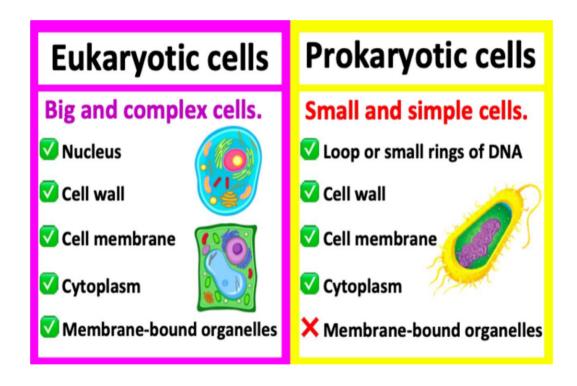
- I. Eukaryotic Cell
- II. Prokaryotic Cell

I. Eukaryotic Cell:

- a. Eukaryotic cell are complex possess more than 1 cell including all plant and animals cell.
- b. the living thing that possess eukaryotic cell are called **Eukaryotes**.

II. Prokaryotic Cell:

- a. Prokaryotic cell are simple possess one cell including bacterial cell
- b. The single cell living thing are called **prokaryotes**.

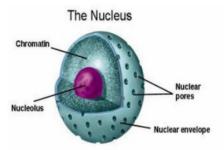


2- Plant and animal cell with similarities and differences

I. Animal Cell:

Different parts of the cell is called **sub cellular** structure. Animals cell have these sub cellular structure.

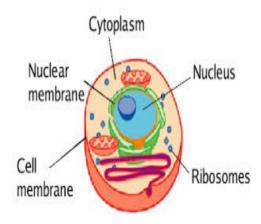
Nucleus: contains genetic material (DNA) that controls the activity of cell.



Cytoplasm: the gelatinous liquid that fills the inside of a cell

Composition: composed of water, salts, and various organic molecules.

Function: the place where most of chemical reactions happen.



➤ <u>Mitochondria</u>: double bounded membrane structure, also called power house of the cell

Function: Aerobic respiration take place.

Aerobic Respiration: A chemical process in which oxygen is used to make energy.

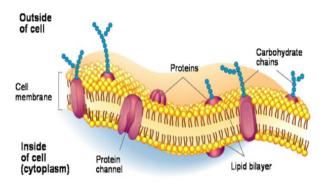
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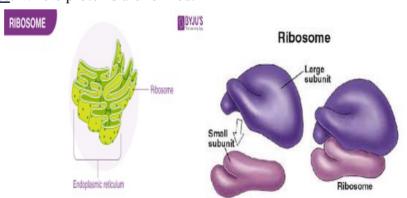
Mitochondria Structural Features Inner Membrane Outer Membrane Cristae Matrix Figure 1

Cell Membrane: also called plasma membrane. It is semi permeable membrane.
 Composition: consist of lipids bi layers, carbohydrates and proteins
 Function: Separates the interior of the cell from the outside

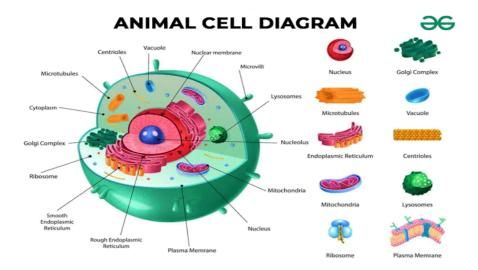
environment.



Ribosomes: Where proteins are formed.

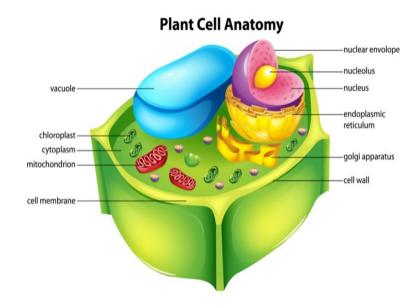


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II- Plant Cell:

Plant cell have almost same sub-cellular structure, plus few extra sub- cellular structure.



➤ <u>Cell wall</u>: Outer layer of plant cell that is rigid.

Composition of cell wall: made of cellulose **Function**: Give support and strengthen the cell.

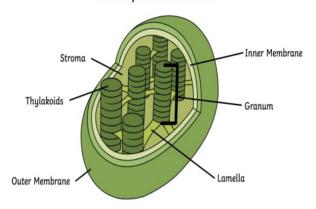
➤ <u>Chloroplast</u>: sub-cellular structure present in only plant cell responsible for **photosynthesis**.

Function: chloroplast having green pigment called chlorophyll where sunlight absorb and make food for the plant. This process is called **Photosynthesis.**

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Chloroplast Structure



<u>Vacuole</u>: also called cell sap (Mixture of sugar and salt).

Function: store nutrients and water on which a cell can rely for its survival.

Plant Cell Central Vacuole

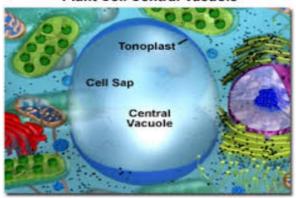


Figure 1

Plant and animal cell with similarities and differences

ANIMAL CELL PLANT CELL Mitochondria > Can be of any > Boxy or square Golgi apparatus shape > Cell wall Smooth and No cell walls rough ER > Large vacuole > Small vacuole **Nucleus** Chloroplast No chloroplast Cytoplasm > Flagella only in Flagella gametes Ribosomes Lysosome Cell membrane DNA

Prokaryotic Cell

- a. Prokaryotic Cell are single cell living organisms including bacteria and archaea.
- **b.** the living organism that possess single cell are called prokaryotes.
- **C.** Prokaryotes lacks true nucleus and other organelles. E.g Bacterial cell.

III- Bacterial cell

- ➤ Bacterial cell are prokaryotes
- They have Single stranded DNA which floats freely in the cytoplasm instead of nucleus
- They may have one and more circular DNA called Plasmid.
- They don't have chloroplast, mitochondria or other organelles.

