



BAL BHARATI PUBLIC SCHOOL, PITAMPURA, DELHI – 110034

SUBJECT:- BIOLOGY

CLASS IX : CHAPTER:- THE FUNDAMENTAL UNIT OF LIFE

Guidelines:-

Dear Students

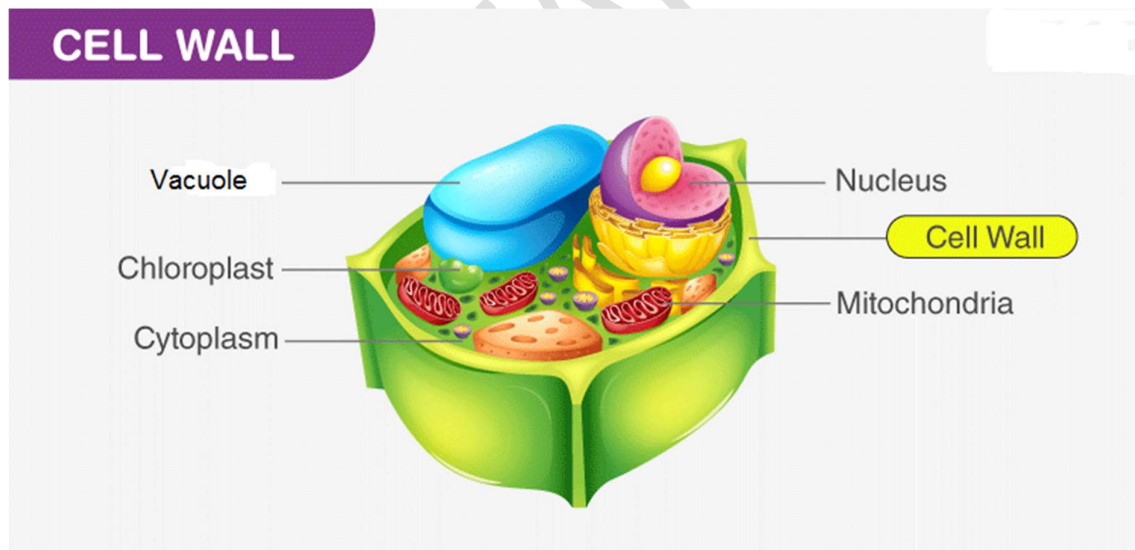
- Refer to the following content of the chapter.
- These notes will help you to understand the concept of the lesson.
- Do the assignment questions in the Biology notebook.

Link for Textbook:- http://ncertbooks.prashanthellina.com/class_9.Science.Science/CHAP%205.pdf

TOPIC:- STRUCTURAL ORGANISATION OF A CELL (part 2)

CELL WALL:-

It is an additional protective rigid outer covering in plant cells that is mainly composed of **CELLULOSE** (a complex material that provides structural strength to plant bodies).



The **cell wall** is present only in plants, fungi, and bacteria. The image shared above represents a plant cell wall.

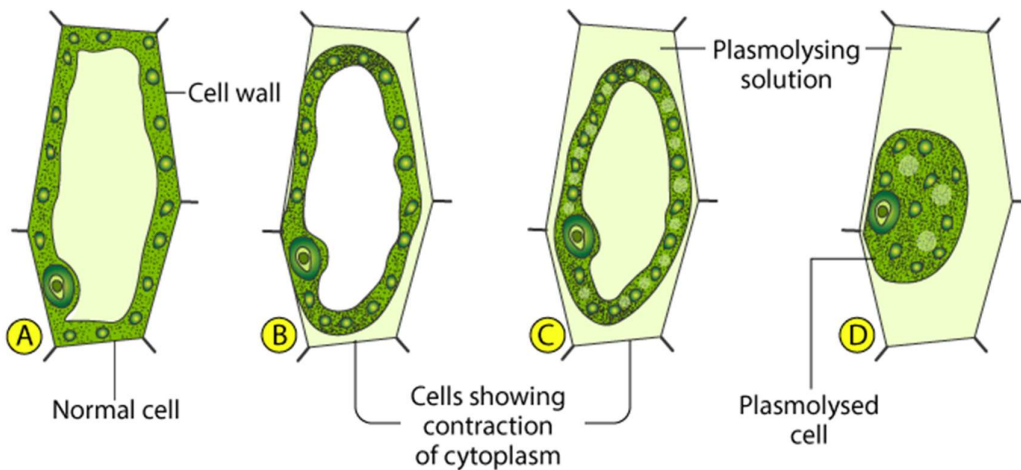
Plasmolysis

Plasmolysis is the process during which living plant cells lose water when placed in a hypertonic solution, a solution with greater concentration of solutes in comparison to the solution inside the cell.

Kindly refer to the link shared below for better understanding of the procedure to prepare a slide of leaf cells:-

<https://in.video.search.yahoo.com/search/video?fr=mcafee&p=video+experiment+for+class+9+for+plasmolysis#id=2&vid=619137b6b13cc4d464e725eab0678143&action=click>

STAGES OF PLASMOLYSIS



Conclusion:-

Plasmolysis is observed when the plant cells are immersed in the concentrated salt solution or sodium chloride 5% solution (**Hypertonic solution**). During this process, 4 to 5 per cent of water passes through the cell membrane into the encircling medium. This occurs as the concentration of water inside the cell is higher than the one present outside the cell. Hence, the **protoplasm** induces shrinkage and takes a spherical shape.

When the plant cells are immersed in a dilute salt solution or sodium chloride 0.1% solution, the water in the plant cells moves inside the cell as the water concentration is higher outside the cell in comparison to the concentration inside the cell. This causes the turgidity of the cell.

The main functions of the cell wall:-

1. Protecting the cell against physical damage and invading pathogens.
2. Regulating and controlling the direction of cell growth.
3. Providing strength, structural support and maintaining the shape of the cell.
4. Functioning as a storage unit by storing carbohydrates for use in plant growth, especially in seeds.

Differences between Cell Wall and Cell Membrane:-

CELL WALL	CELL MEMBRANE
Present only in plants, and in some fungi, bacteria, algae.	Present in all types of cells, in humans, animals, plants, bacteria, etc.
It is the outer non-living part of the cell but not an organelle which encloses cell membrane and provides a fixed shape.	It is an outermost, flexible, living organelle of the cell which provides shape to the cell.

CYTOPLASM:-

What is Cytoplasm?

The fluid that fills up the cells is referred to as the cytoplasm. The cytoplasm is one of the basic components of the cell where **cell organelles** are embedded. It is a semi-liquid jelly-like element which attaches the nucleus and the cell membrane. Other cell organelles such as mitochondria, ribosomes, vacuoles, endoplasmic reticulum, etc., are all suspended in it.

It can easily be examined under a microscope through the staining technique. Functionally, it is the site for several chemical reactions within a cell. Most of the cellular metabolism takes place here.

Functions of Cytoplasm:-

- One of the major functions of cytoplasm is to enable cells to maintain their turgidity, which further enables the cells to hold their shape.
- The jelly-like fluid of the cytoplasm is composed of salt and water and is present within the membrane of the cells. It embeds all parts of the cells and organelles.
- The cytoplasm is home to many activities of the cell as it contains molecules, enzymes that are crucial in the breakdown of the waste.
- The cytoplasm also assists in metabolic activities.
- It fills up the cells thus enabling the organelles to remain in their position. The cells, without cytoplasm, would deflate and substances will not move easily from one to the other organelle.

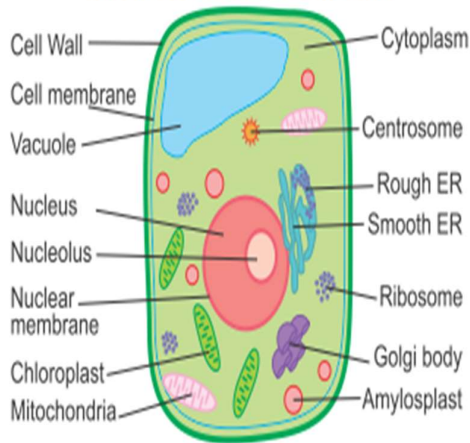
Comparison between Plant Cells and Animal Cells:-

Kindly refer to the link shared below for better understanding of the comparison between plant and animal cells:-

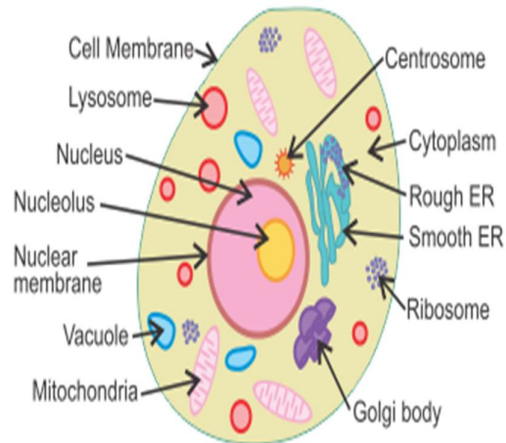
<https://youtu.be/7pd5okYkuYE>

Plant and Animal Cell

Cross section of Plant Cell



Cross section of Animal Cell



Plant cells and animal cells share a few common cell organelles as both are eukaryotes. The function of all these organelles is said to be extremely similar lying between two classes of cells. However, major differences do exist between them which significantly reflect the difference in the functions of each cell.

The major differences between plant cells and animal cells are mentioned below:-

Plant Cells	Animal Cells
Cell Wall	
Present	Absent
Plasma Membrane	
Present	Present
Endoplasmic Reticulum	
Present	Present
Nucleus	
Present and lies on periphery/ side of the cell	Present and lies in the centre of the cell
Lysosomes	
Absent	Present

Centrosomes with centrioles	
Absent	Present
Golgi Apparatus	
Present	Present
Cytoplasm	
Present	Present
Ribosomes	
Present	Present
Plastids	
Present	Absent
Vacuoles	
Few large or a single, centrally positioned vacuole	Usually small and numerous
Cilia	
Absent	Present in most of the animal cells
Mitochondria	
Present but fewer in number	Present and are numerous

ASSIGNMENT:-

1. Name the material which forms the cell wall of plant cells.
2. Analyse what would happen if the cell had no cytoplasm.
3. Carry out the following osmosis experiment: Take four peeled potato halves and scoop each one out to make potato cups. One of these potato cups should be made from a boiled potato. Put each potato cup in a trough containing water.
Now,
 - (a) Keep cup A empty
 - (b) Put one teaspoon sugar in cup B
 - (c) Put one teaspoon salt in cup C

(d) Put one teaspoon sugar in the boiled potato cup D. Keep these for two hours. Then observe the four potato cups and answer the following:

(i) Explain why water gathers in the hollowed portion of B and C.

(ii) Why is potato A necessary for this experiment?

(iii) Explain why water does not gather in the hollowed out portions of A and D.

4. Identify the cell components that are present exclusively in plant cells but not in animal cells .
5. Name some cell organelles present exclusively in animal cells.
6. Draw neat and labelled diagrams of typical plant and animal cells.

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