Grade 10

Start Your Learning Journey with e-thaksalawa

The National e-learning Portal for The General Education

STRUCTURE AND FUNCTIONS OF THE PLANT AND ANIMAL CELL (Study Pack)

Subject : Science

Grade : 10

Term : 1st Term

Unit : 06

Learning out comes:

- Group the supplied sample of cells as animal and plant cells according to the features.
- Differentiate the features of an animal cell and a plant cell.
- State the structure and functions of organelles in plant and animal cells.
- Explain mitosis and meiosis

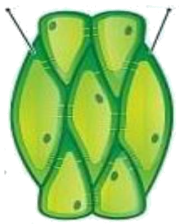
Activity:-

6.1 Basic unit of life

Cell is the basic structural and functional unit of a living body. Group the given sample of cells according to the characteristics given in the chart regarding animal cells and plant cells. Use the knowledge you studied in the class room.

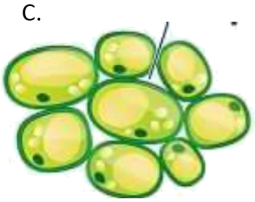
Animal Cells	Plant cells
1. No green color pigmentation	1. presence of green color pigmentation
2. Absence of a cell wall	2. Presence of a cell wall
3. Cell membrane is the outer most layer	3. Presence of image, middle vacuole.
4 Has marginal vacuoles	4. Cell wall is the outer most layer
	5. Presence of a lumen when the tissue is dead (Lumen is the hole of the cell at the middle)

A.

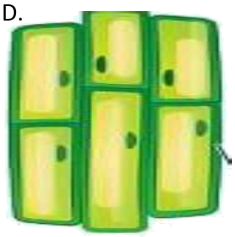


B.

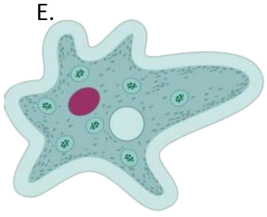
C.



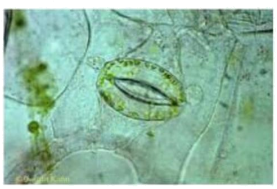
D.



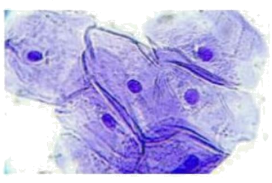
E.



F.



G.



Content: Mr. Mahinda Premarathne, Mrs. Gothamala S. Palpolage

Created by ; G.K.S.D Jayarathne, H/ Weeraketiya Rajapaksa Central College—Weeraketiya

Plant cells	Animal Cells /Animals

Do you know?

- Cell theory is introduced by schleiden, Schwann and Radolf.
- Cell theory contents.
  - The structural and functional unit of life is the cell
  - All organisms are made up of one or more cells
  - New cells are formed from preexisting cells

6.2 Concept of cell

The cell is the smallest structural and functional unit of living organisms, which can exit on its own. It is sometimes called the building block of life. Some organisms such s bacteria or yeast, are unicellular consisting only of a single cell while others for instance, mammalians, are multicellular.

1) Prove, a cell is the smallest structural unit of the living body (Illustrations).
2) Prove, a cell is the smallest functional unit if the living body (Illustrations).
3) Cell perform different functions in the body. List out as functions.

Extra Knowledge

The cell theory state that all organisms are composed of similar units of organization called cells. The concept was formally articulated by Schiedam and Schwann.

Cell are of two type eukaryotic, which contains a nucleus, and prokaryotic, which do not prokaryotes are single celled organisms while eukaryotes can be either single celled or multicellular.

All living cells arise from pre-existing cells by division.

Cells provide six main functions. They provide structure and support, facilitate growth through mitosis, allow passive and active transport, produce energy, create metabolic reactions and aid in reproduction.

6.3 Structure of cells

Activity 1:-

- Recall the memory of observing cells of an onion peel and cheek cells.
- Draw a cell of an onion peel and a check cell.
- List and the organelles and parts you observed under light microscope in your school laboratory.

Activity 2:- Prepare a plant cells and an animal cell

- Supply residues /wastes materials at home
- Prepare a plant cell and an animal cell.
- Draw the cells you prepared and label the parts organelles or
- Take some photos if you have an interest and send to the teacher.
- Try to label the parts of each cell without referring the book.

Answer the following questions by the knowledge you gain in the class room.

1 List and the organelles and parts of a plant cell and an animal cell, when you observe through a light microscope.

2. List out the organelles and parts of a plant cell and an animal cell, when you observe through an election microscope.
3. Compare the features of a plant cell and an animal cell.
4. What is the most salient feature to identify a plant cell?
5. Draw variants shapes of plant cells and compare the organelles, cell shape of each cell you drawn with the typical plant cell.

For your Knowledge

- The similarities among plant and animal cells are the presence of cell membrane, cell nucleus mitochondria, endoplasmic reticulum, ribosomes and golgi apparatus.

- Plant cells composed of middle, large sap filled vacuoles, cell wall and chloroplasts.

- Animal cells composed of marginal vacuoles, cell membrane and internal organelles, but not chloroplasts and cell walls.

6.4 Cell organelles and structures present in a cell

Recall the memory of the observation of permanent slides in the laboratory.

Answer the following questions by recalling the practical knowledge you gain in school

1. List all the organelles and structures of plant and animal cells and write the function of each organelles and the structure.
2. How do you name the membrane that surrounds the vacuole?
3. What component present in cell sap?
4. What is the oval or rod shaped organelles found in animal cells?
5. Which organelles consists of a large and a small subunits?

Do you Know ?

- The cell wall surrounds the plasma membrane of plant cell and provides tensile strength and protection against mechanical and osmotic stress.
- The nucleus is a highly specialized organelle that serves as the information and administrative center of the cell most of the nuclear material consists of chromatin, the unstructured form of the cell's DNA that will organize to form chromosomes during mitosis or cell division.
- Ribosomes are macromolecular machines, found with in all living cells that perform biological protein synthesis.
- Mitochondria are membrane –bound cell organelles that generate most of the chemical energy needed to power the cell's biochemical reactions.

6.5 Cell growth and cell division

Cell growth is the irreversible increase of size or dry mass of a cell. Cell division is the process by which new cells are formed by the division of cellular materials.

1. How do you illustrate cell growth and cell division?
2. Cell division is twofold. What are they?
3. Write the salient features to differentiate the cell division methods?
4. Illustrate the two main cell division processes?
5. Write the significant features of two processes?

Lesson Summary

Cell

Structural unit

Functional unit

Cell theory

No	Cell organelles	function
1	Cell wall	
2	Plasma membrane	
3	cytoplasm	
4	Nucleus	
5	Mitochondrion	
6	Golgi complex	
7	Ribosome	
8	Endoplasmic reticulum	1. Rough 2. Smooth
9	Vacuole	
10	Lysozymes	

Cell division

Mitosis

2n-2n

Illustration

Meiosis

2n-n

Illustration

Content: Mr. Mahinda Premarathne, Mrs. Gothamala S. Palpolage

Created by ; G.K.S.D Jayarathne, H/ Weeraketiya Rajapaksa Central College—Weeraketiya

Evaluation

Multiple choice questions

(1) A content of the call theory,

1. New cells are formed from new cells
2. All organisms are made up of only one cell
3. The structural unit of life is the tissue.
4. All organisms are made up of one or more cells.

(2) Main constituent of a cell wall is,

1. Protein 2. Cellulose 3. Minerals 4. Glucose.

(3) An organelle that can be observed through a light microscope is,

1. Cell wall 2. Ribosomes 3. Nucleus 4. Golgi bodies

(4) The organelle which is responsible of protein synthesis is,

1. Ribosomes 2. Vacuole 3. Mitochondrion 4. Golgi complex

(5) A significance of meiosis is,

1. Cell replacement 2.Wound healing 3. Growth of multicellular organisms
4. Maintain constant number of chromosomes

Structured Essay Type Questions

(1) The small structures present within the cell to perform different functions are known as organelles. All animal cells are covered by a plasma membrane. It is a live semi permeable membrane as well as a selective permeable membrane

i) Plant cell consists with a cell what is the primary cell material of a plant cellග?

---

ii) Name two organs in a plant cell, that to confirm a given sample of cells are plant cells.

---

iii) What is the main function of the cell wall?

iv) Which organelles is responsible for packaging and secretion?

---

v) Name three components which store in a vacuole?

---

2). Chart given below shows the comparison in between main cell divisions you studied. Answer the given questions by studying the chart.

No	A----------	B----------
1	Takes place only in diploid cells	Takes place both diploid and haploid cells
2	Daughter cells are different from mother cell	Daughter cells are similar to mother cell
3	Four daughter cells result at the end of the division	Two daughter cells result at the end of the division.
4	Takes place in two division	Only one division

i. Name A and B

---

ii. Write a significance of a process

---

iii. What is Cell division?

---

iv Human inherits 46 chromosomes . How many chromosomes are there in an egg?

---

v. Meiosis takes place in two stages. What are they?
