

NORTH EX PUBLIC SCHOOL (Session 2020-21)

Class-VIII

Subject-Science

Chapter-7 Cell Structure and function

Topic-Cell structure and function

Worksheet-5

NOTE-Before attempting the question and answers you must check the link given below which will help you understand the chapter

You can download the assignment or if you do not have the facility to get printout then you can ask you what to copy the assignment in a simple notebook and must do question and answer the notebook.

Link : <https://youtu.be/GXXEmMOQ92k>

NOTES:

The cell is the basic structural and functional unit of life. All living organisms are made up of cells. Cells make tissues, tissues make organs, organs make organ systems and organ systems make a living organism. Thus, the cell is the building block, or the structural unit of the living body.

Cells were discovered for the first time by Robert Hooke in 1665. He observed a piece of cork under his microscope. He saw that the cork was made up of many small boxes. He called these little boxes cells. These box-like structures were actually dead cells.

Living cells were observed by Anton Von Leeuwenhoek for the first time using improved microscopes.

Cell Theory Later in 1838, Mathias Schleiden and Theodor Schwann put forward the cell theory of life. According to this theory:

All living organisms are made up of cells.

New cells arise from pre-existing cells.

All cells are similar in structure and function but are not identical.

The function of an organism depends on the way the cells work or the functions they perform.

Shapes and sizes

Depending on their function, the cells show a variation in their shapes and sizes.

They may be oval, spindle-shaped, spherical etc.

Sizes of cells are measured in micrometer or microns. (1 micrometer = 10^{-6} m)

Most cells range in size from 5 micrometer to 15 micrometer.

Bacterial cells are the smallest cells.

The longest cells in our body are the nerve cells.

The egg of ostrich is the largest cell- it is a single cell.

Cell Number According to the number of cells, organisms are broadly classified into two groups- unicellular and multicellular.

Unicellular: Organisms made up of a single cell are called unicellular organisms. The single cell performs all the functions needed for sustaining life- growth, movement, digestion. Amoeba, Paramecium and bacteria are examples of unicellular organisms.

Multicellular: Organisms made up of many cells are called multicellular organisms. The cells of such organisms usually perform specialized functions. Most plants and animals are examples of multicellular organisms.

Structure of a cell The basic components of cell are cytoplasm, cell membrane, nucleus and organelles.

Cell membrane
The thin outer layer of the cell is called the cell membrane or the plasma membrane.

It separates the cell and its contents from the surroundings.

It protects the inner cell contents.

It protects the cell and gives it a shape.

It is selectively permeable and allows water, minerals and other necessary substances to pass through it.

It controls what passes in and out of the cell

Cell Wall

Cell wall is present only in plant cells.

It is an additional wall outside the cell membrane.

It is thick wall made up of cellulose.

The cell wall gives shape to the plant cell, offer protection and provide rigidity to the cell.

The cell wall is important for plants since they do not have a skeleton for support and protection, nor they can move to escape environmental stress.

cytoplasm

The cytoplasm is a jelly-like substance that makes up most of the inside of the cell.

The cytoplasm has the nucleus and various other cellular components within it.

These components are called cell organelles.

Nucleus

The nucleus is a spherical body present inside the cell. It is the control centre of the cell.

The nucleus is surrounded by the nuclear membrane and the liquid present inside is called nucleoplasm.

The nucleus and the cytoplasm together make up the protoplasm.

A smaller spherical structure present inside the nucleus, called Nucleolus plays an important role in protein synthesis.

The nucleus also has a thread-like network called chromatin.

The chromatin organizes itself into rod-like structures when the cell has to divide. These rod-like structures are called chromosomes. They contain the DNA inside them. DNA has the genes that help in transfer of characteristics from parent to the offspring. Therefore, DNA forms the hereditary material in most organisms.

Note: The nucleus and cytoplasm together make up the protoplasm.

CELL ORGANELLES: Organelles are small structures scattered in the cytoplasm that work together to carry out life processes.

There are various types of cell organelles that perform different functions. Some of these are as follows:

MITOCHONDRIA: Mitochondria are small rod-like structures. They provide energy in the form of ATP.

Therefore, they are known as powerhouse of the cell. **RIBOSOMES:** Ribosomes are tiny structure found either attached to the surface of endoplasmic reticulum or scattered in the cytoplasm. Ribosomes are associated with protein synthesis.

PLASTIDS: Plastids are disc-shaped structures present only in plant cells. They can be of three types-chloroplasts, chromoplasts and leucoplasts.

GOLGI BODIES: The

cytoplasm contains a large number of membranous sacs- like structures called Golgi bodies. They are concerned with secreting useful substances such as enzymes and hormones. **VACUOLES:** Vacuoles are sac-like structures in the cell. In mature plant cells, they occupy most of the space within the cell and help to store food, water and wastes. In animal cells, vacuoles are smaller and may be greater in number. They help in waste removal and digestion. **ENDOPLASMIC RETICULUM:** The endoplasmic reticulum is a network of membranous tubes that connect the cell membrane with the nuclear membrane. The endoplasmic reticulum helps to transport substances in and out of cells.

CENTRIOLES AND CENTROSOMES: The centrioles and centrosomes play an important role in cell division. They are present only in animal cells and are absent in plant cells. **LYSOSOMES:** Lysosomes are called as suicidal bags. They are small rounded sacs filled with tissue dissolving enzymes. They help in the digestion of foreign bodies and worn out cell parts.

CELL DIVISION: A cell is very small when it is formed. On receiving nutrition, it grows and reaches a certain size after which it divides to form two cells. This process is known as cell division, and the cells formed are known as daughter cells. Cell division is also necessary for replacement of dead cells. Million of cells are die and replaced every second in our body.

COMPARISON BETWEEN ANIMAL AND PLANT CELLS:

S.No	Animal Cell	Plant Cell
1	Smaller in size	larger in size
2	Cell membrane is present but Cell wall is absent	both cell membrane and cell wall are present
3	plastids are absent	plastids are usually present
4	Vacuoles are smaller and more in number	One large vacuole is present in the cell
5	Centrioles, centrosomes and lysosomes are present	Centrioles, centrosomes and lysosomes are absent

Worksheet-5

Q-1)Cells are the basic structural unit of Living Organism explain?

Q-2)Why mitochondria is called as the powerhouse of the cell?

Q-3) what Is the name of the organelles That can that can help in the cell division?

Q-4)What is the difference between Plant cell and Animal cell.

Q5)How cell wall help plant cell?

ANSWERS

ANS-1) The cell is the basic structural and functional unit of life. All living organisms are made up of cells. Cells make tissues, tissues make organs, organs make organ systems and organ systems make a living organism. Thus, the cell is the building block, or the structural unit of the living body.

ANS-2) Mitochondria are small rod-like structures. They provide energy in the form of ATP. Therefore, they are known as powerhouse of the cell.

ANS-3) The centrioles and centrosomes play important role in cell division.

ANS-4)

S.No	Animal Cell	Plant Cell
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ANS-5) The cell wall is important for plants since they do not have a skeleton for support and protection, nor they can move to escape environmental stress.

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