

Boys' High School and College, Prayagraj

Class: VII

Subject: Biology

Book: Biology for ICSE Schools Book-7 (Kriti Prakashan Pvt. Ltd.)

Theme 1: Tissue (CPT-1)

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Explanation of Organisation

Living things are highly organized and structured, following a hierarchy that can be examined on a scale from small to large.

Types of organisation:

1. Higher Level of organisation – Species, population, community, ecosystem and biosphere
2. Lower Level of organisation – Cell, tissue, organ, organ system and organism

Explanation of Tissue

A tissue is defined as a group of cells, specialized to perform a particular function. There are different types of tissues, both in plants and animals.

Explanation of Plant Tissue

Plant tissue is a collection of similar cells performing an organized function for the plant. Each plant tissue is specialized for a unique purpose and can be combined with other tissues to create organs such as leaves, flowers, stems and roots.

Plant tissue is divided into two types-

(a) Meristematic Tissue

They are the group of young cells, which consists of actively dividing cells and leads to increase in length and thickness of the plant. There are different types of meristematic tissues, which are classified on the basis of positions, functions, plane of divisions, origin and development. It is responsible for the growth of the new organs. It is also involved in the movement of water and nutrition within the plants.

The three main types of meristematic tissues depending on the occurrence of the meristematic tissue on the plant body are:

- i. Apical Meristem.
- ii. Lateral Meristem.
- iii. Intercalary Meristem.

(b) Permanent Tissue

The tissues that are completely grown and has lost the ability of division are known as permanent tissues. There are two types of permanent tissues:

- i. *Simple Tissue-* **Parenchyma, Collenchyma, Sclerenchyma.**

Parenchyma

- The cells have an oval or round shape.
- The cell is thin-walled.
- It is found in all parts of the plant.

Collenchyma

- Cells are long and thick walled.
- It is found in hypodermis of dicot stem and the vascular bundle of dicot leaf.
- The cells have no intercellular spaces.

Sclerenchyma

- These are dead tissues, very hard and rigid in texture.
- Cells are thick walled with various size and shapes.
- These provide mechanical support and rigidity to the plant.

ii. *Complex Tissue-* **Xylem, Phloem.**

Xylem

- It transports water and nutrients from the roots to the leaves of the plant.
- It provides support to the plants.
- It is divided into-tracheids, vessels, xylem fiber, and xylem parenchyma.

Phloem

- It translocates the prepared organic food from the leaves to different parts of the plant.
- It is also known as bast.
- It is composed of sieve tubes, companion cells, phloem parenchyma, and phloem fibers.

Explanation of Animal Tissue

The animal cells are grouped together to form animal tissues. These tissues vary in their structure, function and origin. Animal tissues are basically grouped into four types:

- **Connective Tissue** - They are the group of tissues made up of cells separated by non-living material, called as an extracellular matrix. This tissue gives shape to the organs and holds them in place. For example, blood, bone, tendon, adipose, ligament and areolar tissues.
- **Muscular Tissue** - They are involved in producing force and generating motion, either for the locomotion or for the movement within internal organs.
- **Nervous Tissue** - They are the main tissue components of the brain and spinal cord in the central nervous system.
- **Epithelial Tissue** - They are formed by cells which cover the external parts of the body organs and lines the organ surfaces such as the surface of the skin, the reproductive tract, the airways, and the inner lining of the digestive tract.

Worksheet - I

Note: To be done in the notebook

A. Fill in the blanks with the correct words:

- Biosphere** is the part of environment where life exists.
- Nervous tissue is composed of nerve cells called **neurons**.
- The **connective** tissue connects all the tissues and organs of the body.
- Cartilage** are the tough elastic tissues that are found in the nose, throat, ear and in other parts of the body.
- Some parenchyma cells may also contain chlorophyll, hence are called **chlorenchyma**.

B. Write True or False:

- A group of similar cells constitute an organ. **False**
- The nervous tissues transmit the messages. **True**
- The tissue which protects our body is muscular tissue. **False**
- Cell is the highest and biosphere is the lowest level of organization. **False**
- Blood is a liquid connective tissue which is present in the entire body. **True**

C. Answer the following questions in short:

- What do you mean by the term 'organisation' in the living world? (*Write answer from Terms to Learn*)
- Give two examples of organ systems.

Answer: The two examples of organ systems are circulatory system and nervous system.

- What is tissue? (*Write answer from Terms to Learn*)
- Which tissue is responsible for the movement in animals?

Answer: Muscular tissue is responsible for the movement in animals.

- Why is leaf called an organ of the plant?

Answer: A leaf is called an organ of the plant because leaf is made up of different kinds of tissues or it is a group of tissues to perform the function of photosynthesis.

D. Answer the following questions in detail:

- Explain the structure and function of nerve cell (neuron) with the help of a labeled diagram.

Answer: Nervous tissue is composed of nerve cells called neurons.

Structure: The main body of neuron having nucleus is the cell body with branching dendrites and a long cytoplasmic structure called axon. The dendrites connect one neuron to another. The axon transmits impulses to an organ or collects impulses from the sensory organs.

Function: They transfer the information from one part of the body to another.

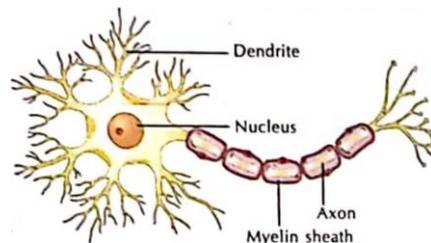


Fig.1.12 A nerve cell, axon

- Explain the characteristic features of living things.

Answer: Living things have the following characteristic features:

1. **Definite shape and size:** Living things have definite shape and size.
2. **Growth:** Growth is one of the most important features of living things.
3. **Respiration:** It is the process by which organisms take in oxygen and give out carbon dioxide.

4. Excretion: Removal of waste products.
5. Chemical composition: Organisms are composed of carbohydrates, fats, proteins and nucleic acids.
6. Reproduction: Living organisms have the ability to reproduce their offspring.
7. Healing and Regeneration: They have the ability to heal and regenerate the injured parts.
8. Movement: They have the ability to move.
9. Response to stimuli: Living things are influenced by their surroundings.
10. Death: Each organism has an average life period in which it grows, reproduces and dies. This period is called life span.
11. Organisation: Living things have a unique organisation by which they perform various functions of life.

iii. Write the functions of muscular and epithelial tissues.

Answer: **Functions of muscular tissue:**

1. The muscular tissues help in the movement of various parts of the body and thus help in locomotion.
2. They also cause the movement of internal organs.
3. They help in the movement of food in the alimentary canal.
4. They also help in pumping of the blood to the various parts of the body.

Functions of epithelial tissue:

1. It protects the underlying structures from injury.
2. The cells present in the stomach secrete juices, which help in digestion.
3. Some cells help in absorption of digested food.
4. Cells of the skin excrete sweat to remove waste products.

Worksheet - II

Note: Exercises to be done in the notebook

A. Match the Following:

Column A

1. Cell Wall
2. Digestive System
3. Lining wall of the stomach
4. Conduction of food in plants
5. Blood
6. Mechanical support to the plant

Column B

- a) Phloem
- b) Connective Tissue
- c) Muscular Tissue
- d) Plant Cell
- e) Sclerenchyma
- f) Epithelial Tissue

B. Answer the following questions in detail:

- i. Explain the lower level of organisation.
- ii. Write the characteristic features of permanent tissue.
- iii. Write a short note on cardiac muscles.

C. Define the following:

- i. Ecosystem
- ii. Biosphere
- iii. Tendons
- iv. Ligament
- v. Areolar
- vi. Adipose
- vii. Cartilage
- viii. Bone

D. Draw and color the following diagrams:

- i. Lower level of organisation.
- ii. Meristematic tissues in plants.
