

ST.XAVIER'S SCHOOL

Belguma

Purulia

Subject- Biology

Phase- 1

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Chapter 1- Plant and Animal Tissues

Class-VII

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Instructions to the students

1. You have been provided with the study material relevant to the chapter for your better understanding. Use it as reference along with you textbook.
2. The diagrams provided are for your clarity .You can either use them or the ones provided in your books.
3. Solve the exercise multiple choice questions and short answer questions till question no.9 in textbook and question no.10 to 17 in notebook respectively).
4. The assignment enlisted at the end of this study material must also be done in the notebook.

Tissues:

A group of similar cells specialized to perform a specialized function.

Kinds of tissues:

-Plant tissues

-Animal tissues

Classification of Plant Tissues

On the basis of their dividing capacity and growth plant tissues are of two types:

a) Meristematic Tissues-

They consist of cells which have the ability to divide throughout the life of plant and produce new cells. They are responsible for growth by elongation and increase in thickness of the plant

Location- Found in the growing regions like stem, root and shoot tips.

Characteristics-

1. Cells are small and thin walled.
2. Cells are uninucleated with large and conspicuous nucleus.
3. Lacks intercellular spaces.
4. May contain few or no vacuoles.
5. Cells undergo rapid cell division to produce new cells.

b) Permanent Tissues-

These are meristematic tissues which on maturity lose the ability to divide and differentiate into specialized tissue.

Location- Found in every part of the plant.

Characteristics

1. The cells of permanent tissues have thick or thin cell wall.
2. The cells may be dead or living. In living cells the nucleus is small.
3. May contain intercellular space.
4. Vacuoles may be present or absent.
5. They lose the ability of dividing.

Types of Permanent Tissues

1. Simple Permanent Tissues

- ✓ Simple permanent tissue is composed of single type of cells which have similar origin, structure and function.
- ✓ They provide support, strength and protection.

Types of Simple Permanent Tissues:

a) Protective Tissues- These tissues protect plant cells from outer environment and consist of cells with thick cell walls. They are found on surface of roots, stems and leaves.

Example- Epidermis, Cork.

b) Supporting Tissues- These tissues provide support to the developing plants and give the strength to the plant.

Example- Parenchyma, Collenchyma and Sclerenchyma.

[NOTE: In the diagram given below notice the gradual increase in the thickness of cell wall in the three types of cells. Also pay attention to the presence of intercellular spaces in parenchyma and to some extent in collenchyma. Sclerenchyma tissue lacks intercellular space].

[Refer to page no.-4 (Table 1.1) in your textbook for characteristics and function]



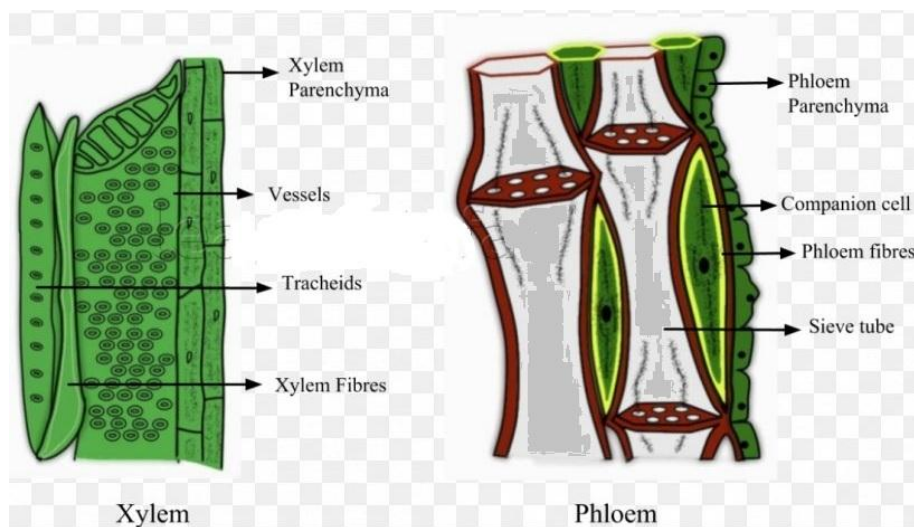
2. Complex Permanent Tissues-

- ✓ Complex permanent tissues consist of many cells which work together and perform a common function.
- ✓ These cells may be living or dead.
- ✓ These tissues transport water, mineral salts and food materials to various parts of the plant.

Types of Complex permanent Tissues:

- a) **Xylem**- Consists of Tracheids, vessels, xylem parenchyma and fibres. Conduct water and minerals and give mechanical support to the plant.
- b) **Phloem**- Consists of Sieve tube, companion cells, phloem parenchyma and fibres. Conduct food materials prepared in leaves.

[Refer to page no. 5 in your textbook for diagrams, functions, difference and other details]



Classification of Animal Tissues

The bodies of animals are also made up of different types of tissue. They can be classified on the basis of structure and function into four types:

- 1) Epithelial
- 2) Connective
- 3) Muscular
- 4) Nervous

[Refer to page no. 10 in your textbook for a detailed chart]

1. Epithelial Tissues

- Comprises of a continuous sheet of cells covering the entire animal body internally and externally.
- The cells are closely packed together and lack intercellular space.

On the basis of the shape of the cells the epithelial tissues are classified into four types:

- 1.1. Squamous
- 1.2. Cuboidal
- 1.3. Columnar
- 1.4. Ciliated

[Refer to page no. 7 (Fig.1.6) in your textbook]

2. Connective Tissues

- Joins one group of tissues to another. It also fills up the spaces between various organs.
- Provide support to different organs to keep them in proper position.

Connective tissues are of three types:

a. **Supportive Connective Tissue-** Forms supporting framework of the body.

i) Bone

- Made up of matrix and cells.
- Matrix is made of calcium and phosphorous.
- Matrix is arranged in form of concentric layers around a central canal.
- The bone cells are present in minute spaces in the matrix.

Location- Forms the rigid endoskeleton of the body.

ii) Cartilage

- Consists of ground substance called matrix which contain cartilage cells and fluid filled space called lacunae.

Location- Wind pipe, external ear (pinna), tip of nose.

- b. Fibrous Connective Tissue-** Serves for packing and binding of most of the organs.
- i) **Areolar Tissue**-Forms a continuous layer that binds the skin with underlying organs.
 - ii) **Adipose tissue**-Consists of cells specialized to store fat. Cushions and insulates the body.
 - iii) **Tendon**- Joins muscles to bones.
 - iv) **Ligaments**-Joins two bones.

[Refer to page- 8 (Fig.1.9 in your textbook)]

c. Fluid Connective Tissue-Helps in transportation of materials and provide defence.

i) **Blood**

- Red in colour
- Composed of fluid part(called plasma) and cellular part(includes RBC,WBC,Platelets)

ii) **Lymph**

- Straw coloured fluid
- Composed of fluid part (plasma) along with cellular part(WBC).Lacks RBC and platelets.

3. Muscular Tissues

- Comprises of Elongated cells which are tightly packed,also called muscle fibre.
- Muscular tissue bring about movement by their ability to contract and relax.

3.1 Striated/Voluntary/Skeletal Muscle-

Location-Present in hands, legs, tongue, jaws.

Shape-Cylindrical, unbranched, dark and light bands(striations) are present. Multinucleate.

Function- Helps in movement of food, urine from the urinary bladder.

3.2 Unstriated/Involuntary/Smooth Muscle-

Location-Present in walls of stomach, intestines, urinary bladder, muscles of iris in the eye.

Shape-Spindle shaped, bands are absent. Uninucleate.

Function- Helps in movement of bones.

3.3 Cardiac/Involuntary Muscle-

Location- Present only in the heart.

Shape- Cylindrical and branched, dark and light bands are present.Uninucleate.

Function- Cause the rhythmic movement of the heart.

[Refer to page no. 79 (Fig.1.11) in your textbook]

4. Nervous Tissues

- Constitutes the nervous system and help in the control and coordination of the body.
- Present in brain, spinal cord, and nerves.
- Made up of nerve cells or neurons.
- Each neuron has a central part called the cell body or **cyton**. The cyton has
 - Many thread like branches extending from all side of the cyton called **dendrons** which further divide to form dendrites. One of these extensions is larger than the rest and is called **axon**.
- A bundle of axons form a nerve.

Function- Information /message is transmitted by a neuron in the form of impulses

<https://m.youtube.com/watch?v=9NCvTNcS2IU>

<https://m.youtube.com/watch?v=7JKq-dfYat4>

[Click on the links given for videos on related topics]

Exercises –page no. 15 (to be done in notebook)

Find the answers for questions

Q10) At Page no. 5. Q 11) At Page no. 2 & 3. Q12) At page no. 5. Q13) At page no. 5. Q14) At page no. 10. Q15) At page no. 7. Q16) At page no. 10. Q17) At page no. 9.

Assignments to be done in the notebook

- 1) What are protective tissues?
- 2) What type of tissue is blood?
- 3) Differentiate between-
 - a) Meristematic and permanent tissue
 - b) Parenchyma and sclerenchyma
 - c) Ligament and tendon
- 4) Label the parts numbered 1 to 6.

