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Where Minds Pollinate

Class 9
Biology 

Chapter 4

Handwritten Notes

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tissue, Organ

⇒ Types of Animal tissue :-

Tissues are group of cells with similar functions.

→ Four Basic Tissue types (human n other large multicellular)

Epithelial Tissue :-

- Covers
- Protects
- secretes glandular secretion
- Form skin n lining of tubes n organs (gastrointestinal tract).

Muscular Tissue :-

- Movement
- Moves body parts or substances
- It is found in heart, tubes and muscles.

Connective Tissue :-

- Connects
- Supports
- Transports
- stores
- Found in blood, fat, bone, cartil.
- loose n dense connective tissue.

Nervous Tissue :-

- Carries msg around the body
- It form brain, spinal cord, Nerves.

⇒ Organs :-

Organs are two or more types of tissues that work together to complete a specific task.

For examples:-

- Heart :- It pumps blood.
- Lungs :- It brings O_2 in and eliminates CO_2 .
- Skin :- It provides barrier to protect internal structure from external environment.
- Stomach :- It digests food.
- Kidney :- It filters blood.
- Liver :- Produces new blood cells.

→ Stomach:-

Stomach wall has four layers that work together to digest food and protect the body.

The layered wall of stomach provides a good example of how tissue forms an organ.

- **Mucosa** :- Innermost layer producing mucus to shield stomach from acid and enzymes.
- **Submucosa** :- Layer containing blood vessels, nerves, glands that support digestion.
- **Muscularis** :- Layer of smooth muscles that contracts and relaxes to mix food.
- **Serosa** :- Outermost layer, thin membrane protecting the stomach from surrounding organs.

⇒ Organ System :-

An organ system is group of organ that perform related functions.

For examples:-

* Cardiovascular system :-

- Heart, Blood vessels
- They work together
 - 1- To circulate blood
 - 2- Bringing O_2 and nutrients to the cell throughout the body
 - 3- Carrying away CO_2 and metabolic wastes.

* Respiratory system :-

- 1- Bring O_2 into the body
 - 2- Get rid of CO_2
- It includes :-

↳ Nose, Mouth, Pharynx, Larynx, Trachea, Lungs.

⇒ Organ System work together :-

Just as organs in organ system working together to accomplish their tasks, the diff organ systems also cooperate to keep the body running.

For examples-

Respiratory system and circulatory system work closely together to bring O_2 to the cell and get rid off CO_2 that these cell produces.

Circulatory

- Pick up O_2 in the lungs
- drop it off in the tissues
- perform reverse function

CO_2

Respiratory

- Expel CO_2
- Bring new O_2 -containing

Only when both systems are working together, can CO_2 and O_2 be successfully exchanged b/w cell and environment

homeostasis

⇒ Intro:-

- The tendency to maintain stable, relatively constant internal environment is called homeostasis.
- The body maintain homeostasis 4 many factors, For example:-
 Temp
 Concentration of various ions
 pH
 Concentration of glucose
- If these values get too high or low, we can end up getting sick.
- All enzymes of the body work properly if homeostasis is maintained.

⇒ Importance:- (advantages)

- 1- Homeostasis is the essential process by which human body maintain its ^{consistent} internal environment despite changes in external situations
- 2- This precise equilibrium (stability) promotes proper functioning of cells, tissues, organs.
- 3- Homeostasis controls vital body functions such as temperature (98.6°F), blood pressure, blood pH, blood sugar lvl, hydration.
- 4- It also regulate the lvl of hormones, electrolytes, minerals.

- 4- By maintaining homeostasis, body defend itself from harm, allow & healthy growth and development, promotes overall health.

5- For example,

→ when blood sugar lvl rises after a meal homeostasis causes insulin release to lower them.

→ When temp lowers, homeostasis causes shivering to produce heat.

6- This self regulation enables human to adapt, deal with stress, & stay healthy.

→ Maintaining Homeostasis:-

All the organ systems of body work together in the body to achieve homeostasis.

* Cardiovascular system:- (transport truck)

- Organs:- Heart, blood vessels (arteries, veins, capillaries) and blood.
- Normal function:- Transport substances towards & away from cells.
- Homeostasis function (Main):- It maintains lvl of gases, wastes, body temp, pH (GWTpH).

* Digestive system:- (break + absorb)

- Organs:- Mouth, Esophagus (food pipe), Stomach, small and large intestines, Liver, Pancreas.
- N.F:- Digest foods
absorbs minerals, vitamin, nutrients and water.
- H.F:- It maintain lvl of nutrients in blood.

* Respiratory system :- (Gas exchange station).

- Organs :- Nose, Trachea (windpipe), Bronchi and Lungs.
- N.F :- Transport Air, exchange gases.
- H.F :- It maintain the balance of O_2 and CO_2 .
 (In O_2 , out CO_2).

* Urinary System :- (Filter machine)

- Organs :- kidneys, Ureter, Urinary Bladder, Urethra.
- N.F :- Removes excess water, salts, waste products from blood.
- H.F :- It maintains levels of water, salts, H⁺ and wastes in body (wshw).

* Nervous System :- (Fast boss / Msg)

- Organs :- Brain, spinal cord, Nerves.
- N.F :- receives info, control other organ system.
- H.F :- Maintain homeostasis by rapidly controlling body functions.

* Integumentary System :- (Body cover - protects)

- Organs :- Skin, hair, nails.
- N.F :- makes a barrier.
- H.F :- It maintains temp, protects against infection by microorganisms.

* Muscular System :- (Movement + heat).

- Organs :- skeletal, smooth and cardiac muscles
- N.F :- Provides movement & support
- H.F :- Temp regulation by heat production

* Skeletal System :- (S.P.M - ~~B.S.M~~).

- Organs :- Bones, Cartilage and joints.
- N.F :- Support and protects soft tissues of body
 - Provide movement at joints
 - Produce Blood cells
 - Stores minerals.
- H.F :- It maintains the lvl of calcium and other minerals in blood.

* Endocrine System :-

- Organs :- Glands (Thyroid, Pancreas, Adrenal etc)
- N.F :- provides communication within the body in direct long-term change in other organ systems.
- H.F :- It maintains balance of many blood components like glucose, water, calcium etc.

Plant tissues

Intro :-

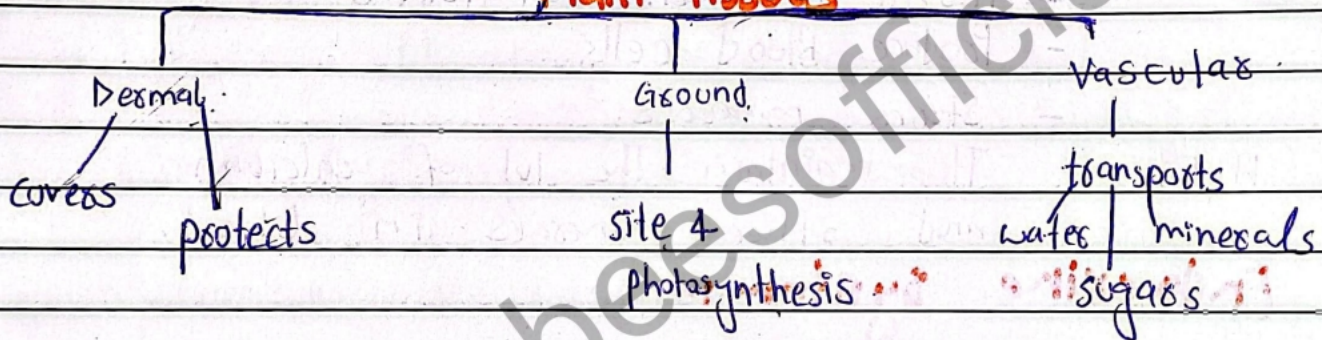
Plants & Multicellular eukaryotes with tissue systems

Diff tissues combine to form organs.

Each of organ itself is also specific 4.

a particular function together making up the tissue system.

Plant tissues



Relation with Plant Physiology

Support systems — transport substances.

[illegible]

Organs work together to form Organ system

Fern, — Vascular plants — that have special tubes
 grasses, / (xylem, phloem) inside them to transport
 flowering plants / transport system water, minerals and food
 shrubs
 trees.

Organ Systems:-

Vascular plants

Shoot system

Vegetative
(non-reproductive)

Leaves, stems

generally
grows above
the ground.

Reproductive

flowers, fruits.

where it absorbs
light needed for
photosynthesis.

Xylem

- type of tissue in plants
- acts as transportation system.
- carries water and minerals from root to leaves.

* Made up of 4 main components:-

1- Tracheids:-

- Long, hollow tubes • carry water

2- Vessels:-

- Wider tubes • help water flow faster.

3- Xylem parenchyma:-

Cells that store food and water.

4- Xylem fibers:-

- strong fibers • support the plant.



Root system.

usually ~~grow~~
underground

anchors the
plant into the
ground.

absorbs water
minerals
serve as storage
site for food.

Phloem

- transports food, sugar and other essential nutrients produced by photosynthesis.
- carries the prepared food from leaf to other parts of the plant.

* Phloem consist of:-

1- Sieve tube cells:-

- Special cells • help nutrients to move

2- Companion cells:-

Cells that assist sieve cells

3- Xylem fibers:-

Strong fibers supporting the plant

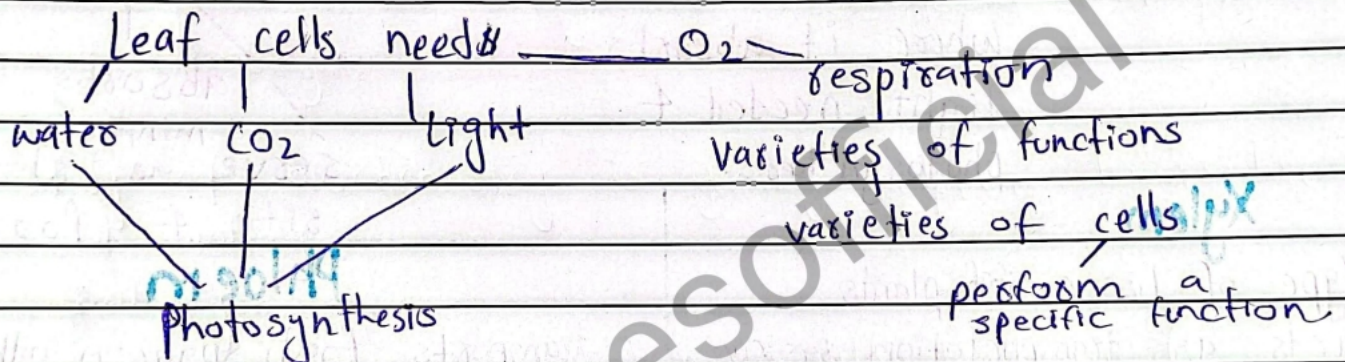
4- Phloem parenchyma

- Cells storing • Processing nutrients

Structure of cells of a leaf

Leaves are thin, flat organs responsible for photosynthesis in plants.
Develops laterally at the node.
Imp part of shoot system

Photosynthesis transpiration (loss of water as water vapour through leaf's stomata)



Leaves transfer synthesized food to all parts of the plant

* Epidermis — outermost layer

Single layer of cells
Function: Prevent loss of water, protect tissues, covers the leaf surface.

Guard Cells

Control the opening and closing of stomata

Cutin Stomata

waxy substance on lower epidermis
forms cuticle
tiny pores

covers the upper epidermis

enclosed by two guard cells having chloroplast

Function

exchange of O₂ and CO₂ with environment, evaporation of water vapours.

* **Mesophyll** :- b/w the 2 epidermal layers lies a group of cells.

• **Palisade mesophyll**

two or three layers of cylindrical cells.

Cell contain many chloroplast.

• **Spongy mesophyll.**

Consists of loosely arranged irregular shaped cells having chloroplasts.

Large intercellular spaces are present among these cells.

This arrangement facilitates diffusion of gases.

* **Vascular bundle** :-

xylem

phloem