

Chapter :- 1

Life process

NOTES :-

What are life process?

The basic and essential activities performed by a living organism to sustain and maintain life.

Four life process.

- (i) Nutrition
- (ii) Respiration
- (iii) Transportation
- (iv) Excretion

Nutrition

The process of deriving and utilization of food is called nutrition.

- ① Energy
- ② Growth & Development
- ③ Repairing of tissue.

Nutrients [Components of food]

Carbohydrates

Proteins

Fats

Vitamins & Mineral

Types of Nutrition

- (i) Autotrophic [Producers] (ii) Heterotrophic [Dependent]

(i) Autotrophic Nutrition

These organism prepare own food, such as Plant, Bacteria etc.

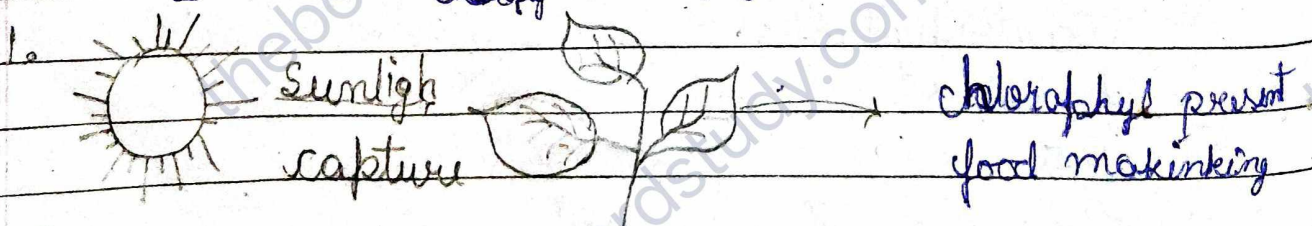
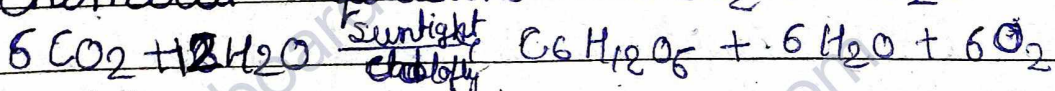
Through photosynthesis [Photo means light and synthesis means to prepare.]

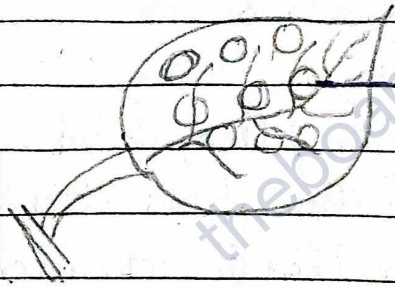
Ingredients of photosynthesis

- (i) Sunlight
- (ii) Chlorophyll
- (iii) Water (H_2O)
- (iv) Carbon dioxide (CO_2)

- 1) Trapping of light by chlorophyll.
- 2) Conversion of light energy into chemical energy by photolysis of water. [Light break / water break in electron these electron help in conversion of energy].

Chemical Equations $\rightarrow 6CO_2 + 6H_2O$





* water molecule

Break down into electron is with the help of light called photolysis of water

Heterotrophic Nutrition

They organism cannot prepare own food.
 Such animal, human etc.

① Saprophytic Nutrition

Grow on Death and decayed place or organism.
 These are also called scavenger.

Ex:- Fungi, Bacteria etc.

② Parasitic Nutrition

They organism lives on other organism but do not kill him.

Ex:- Flea, tick, Lice, leech.

③ Holozoic Nutrition

Nutrition in Amoeba

* It is a unicellular organism.

* Eukaryotic (protista)

* No fixed shape, keep changing its shape due to Pseudopodia.

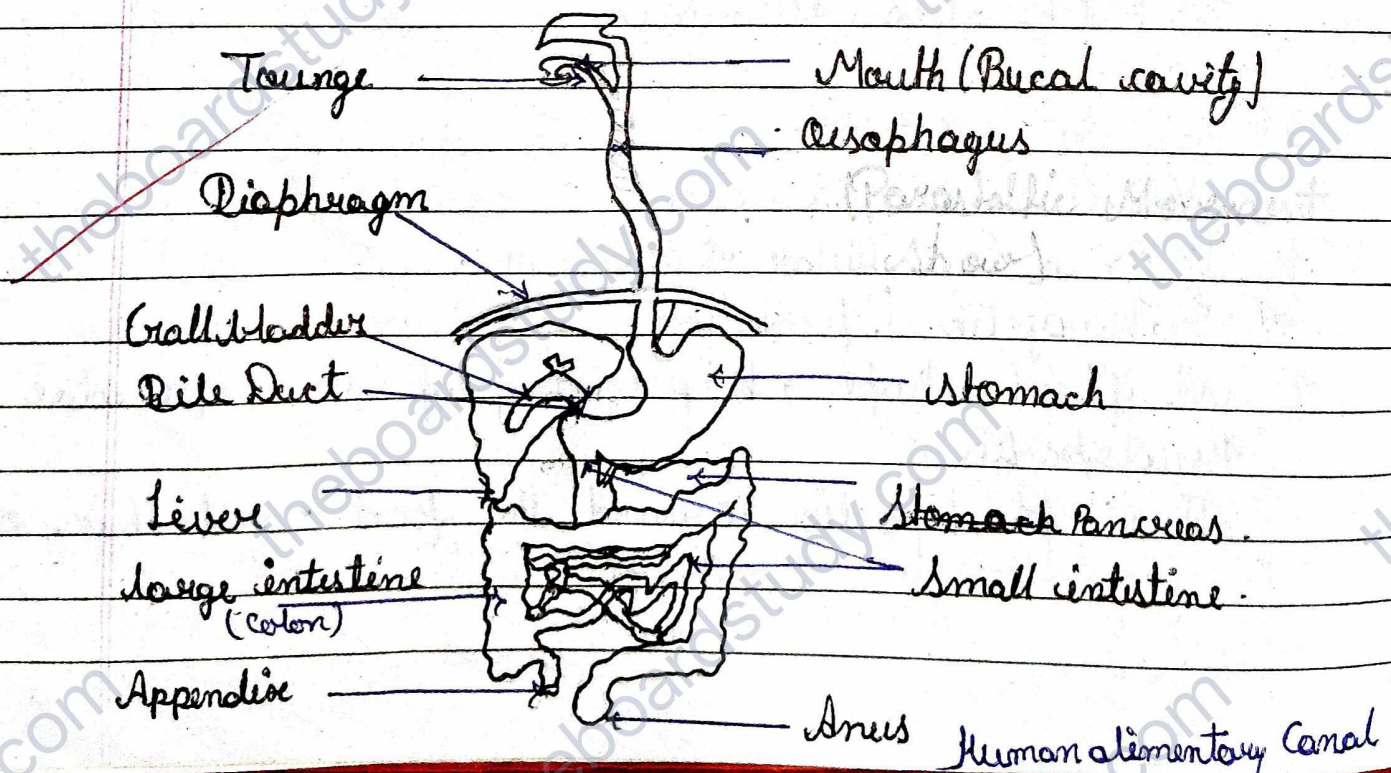
These pseudopodia around the food and then digest.

Nutrition in human beings.

- (i) Ingestion: Taking of food
- (ii) Digestion: Break down of complex food and substances into smaller soluble food substances.
 Two types of Digestion (i) Mechanical (ii) chemical
- (iii) Absorption: Digested food is absorbed in body.
- (iv) Assimilation: Absorbed food is used to provide energy of form new protoplasm.
- (v) Egestion: Removal of undigested food.

Human Digestive System

- Alimentary canal: A long hollow tube which contains organs through which the food actually passes [Oesophagus, stomach, small intestine, large intestine] etc.
- Accessory organs: Organs that help in digestion but no food passes through them [liver, pancreas, salivary glands, gastric juices].



Mouth (Buccal cavity)

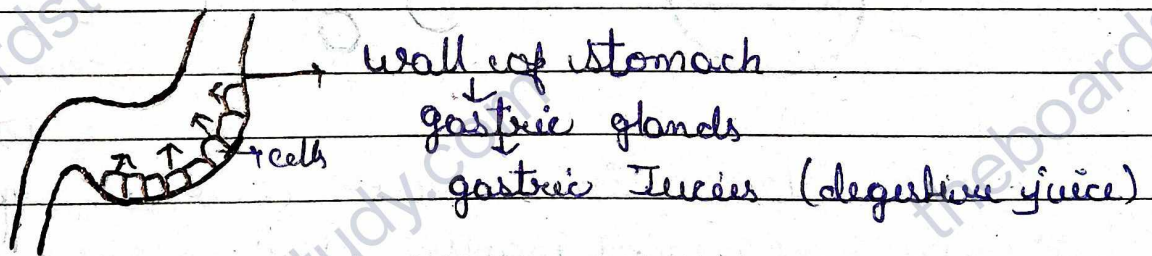
- food is ingested
- crushed and chewed with help of teeth
- food is wetted with saliva to make its passage smooth
- food is mixed with saliva with the help of muscular tongue.

Mouth $\rightarrow$ Salivary gland $\rightarrow$ saliva $\rightarrow$ Salivary amylase.
 [Starch (carbohydrate) converted into Maltose (simple sugar)]. 60% starch digested in our mouth.

Esophagus (food pipe)

- food is pushed downwards due to rhythmic contraction and relaxation of muscles (involuntary) and is known as peristaltic movement.
- It is made up of smooth muscles.

Stomach



Types of Gastric Juice

- | | | |
|----------------------------------|-------------------------|-------------------------------------|
| ① Pepsin | ② Hydrochloric acid | ③ Mucus |
| Enzymes that break down proteins | Makes the medium acidic | Protect the inner lining of stomach |
| | * Disinfection of food | |
| | * Kill germs | |

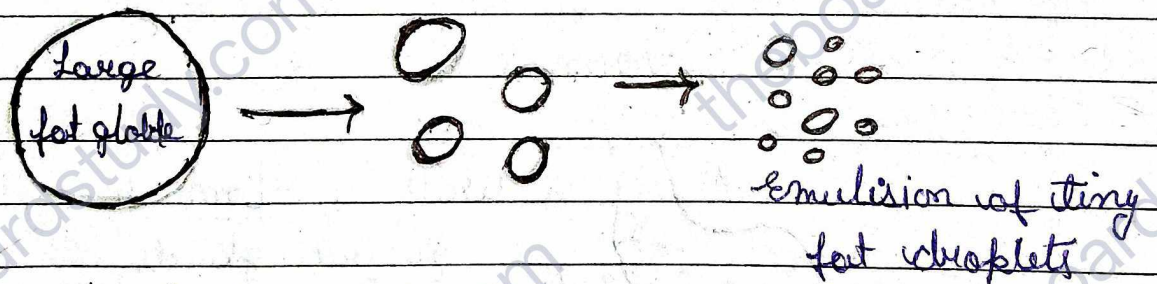
Increased the secretion of HCl causes "acidity"

ENO Base → Neutralize

Largest gland of our body is present in liver

- Small intestine walls contain glands which secrete intestinal juice → intestinal enzymes → final digestion of food.
- Pancreas secretes Pancreatic Juice & liver secretes Bile Juice [Bile Salts]. In small intestine
- Secrete Bile Juice → Bile Salts.
- Bile juice is stored in gall bladder.
- Bile Juice makes food alkaline.
- Bile Juice help in emulsification of fats.

→ Emulsification of fat



Emulsification: break down of large fat globes into small soluble fat globes.

Pancreas: Secrete pancreatic juice which contains Enzymes like:

- ① Trypsin - helps in digestion of proteins.
- ② Lipase: helps in breaking down of emulsified fats.

③ pancreatic amylase: helps in digestion of carbohydrates.

Small intestine

- It is a largest part of our Alimentary Canal
- 5 to 7 meters long
- Site of final digestion of food

- * Carbohydrate $\rightarrow$ Glucose
- * Proteins $\rightarrow$ Amino acids
- * Fats $\rightarrow$ fatty acid + Glycerol.

Villi (found in Small Intestine)

- Villi finger like projections.
- Increase the surface area for absorption
- Richly supplied with blood and every vessel which takes the absorbed food to each and every cell of the body.
- food is utilised for obtaining energy, building body, making up new tissue and the repair of old tissue.

* Unabsorbed food is sent into the large intestine

Large Intestine (colon)

Absorption of water

Anus (Egestion) $\rightarrow$ Removal of undigested & unabsorbed food.

Why the length of small intestine different in different animals?

The length of the small intestine differs in various animals depending on the food they eat. Herbivores need a longer small intestine to allow the cellulose (present in plant cell wall) to be digested. Meat is easier to digest, hence carnivores like tigers have a shorter small intestine.

Breathing

Process of exhaling & inhaling the air in & out of the lungs. [Exchanging of gases]

Difference between Respiration and Breathing.

Breathing	Respiration
• Process of exhaling & inhaling the air in & out of the lungs	• Process of breaking down of glucose to produce energy.
• It takes place in lungs	• It takes place in all cells
• It is a physical process	• It is a chemical process
• Energy is not produced	• Energy is produced in the form of ATP

Respiration

Breaking down of food to produce energy inside the cells.

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Glucose + oxygen $\rightarrow$ Carbon + water + Energy
 from the dige- from the dioxide waste's usefull
 live system breathing system waste product product exhaled
 exhaled

Types of Respiration

Aerobic Respiration

Presence of O_2

Anaerobic Respiration

Alcoholic fermentation

Absence of O_2

Lactic Acid

fermentation

Lack of O_2

Aerobic Respiration [with Air]

The respiration which uses oxygen is called Aerobic respiration.

Glucose $\xrightarrow{\text{Glycolysis}}$ Pyruvate $\xrightarrow{O_2}$ $6CO_2 + 6H_2O + 38ATP$
 (1 Molecule) (in cytoplasm) (Pyruvic acid) (in Mito- (Carbon water Energy
 (2 Molecules) chondria) dioxide.

The Glucose food is completely broken down into Carbon dioxide and water by oxidation. Produced a considerable amount of energy for use by the organism which gets stored in the ATP molecules.

1 Molecule of Glucose (food) produced 38 energy rich ATP molecules.

Mitochondria are the sites of aerobic respiration in the cells. [water, carbon dioxide and energy take place in mitochondria].

Anaerobic Respiration (without air)

The respiration which takes place without oxygen is called anaerobic respiration.

→ In aerobic respiration, the micro organism like yeast break down glucose (food) into ethanol and carbon dioxide, and release energy.

Glucose $\xrightarrow{\text{Glycolysis}}$ Pyruvate $\xrightarrow{\text{In anaerobic}}$ 2 Lactic acid + 2 ATP
(1 Molecule) (in cytoplasm) (Pyruvic acid) (Muscle acid) Energy

→ In human beings (2 Molecule) tissue obtain energy by anaerobic respiration during vigorous physical exercise. In our muscle when oxygen gets used up faster, in the muscle cells than can be supplied by the blood. Glucose $\rightarrow$ lactic acid.

Glucose $\xrightarrow{\text{Glycolysis}}$ Pyruvate $\xrightarrow{\text{In anaerobic}}$ $2C_2H_5OH + 2CO_2$
(1 Molecule) (in cytoplasm) (Pyruvic acid) (Yeast) Ethanol Carbon dioxide
(2 molecules) (Fermentation)
+ 2 ATP Energy

That the whole process of anaerobic respiration takes place in the cytoplasm of cells.

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The microscopic organism like yeast and some bacteria obtain energy by anaerobic respiration which is called fermentation.

Respiration In plants

The plants get the energy by the process of respiration.

- Oxygen and carbon dioxide are called respiratory gases.
- All the plants parts (like root, stem, and leaves) perform respiration individually.
- There is a little transport of respiratory gases from one part of plant to the other.
- The respiration in plants occurs at a slow rate.

Plant get Oxygen by Diffusion

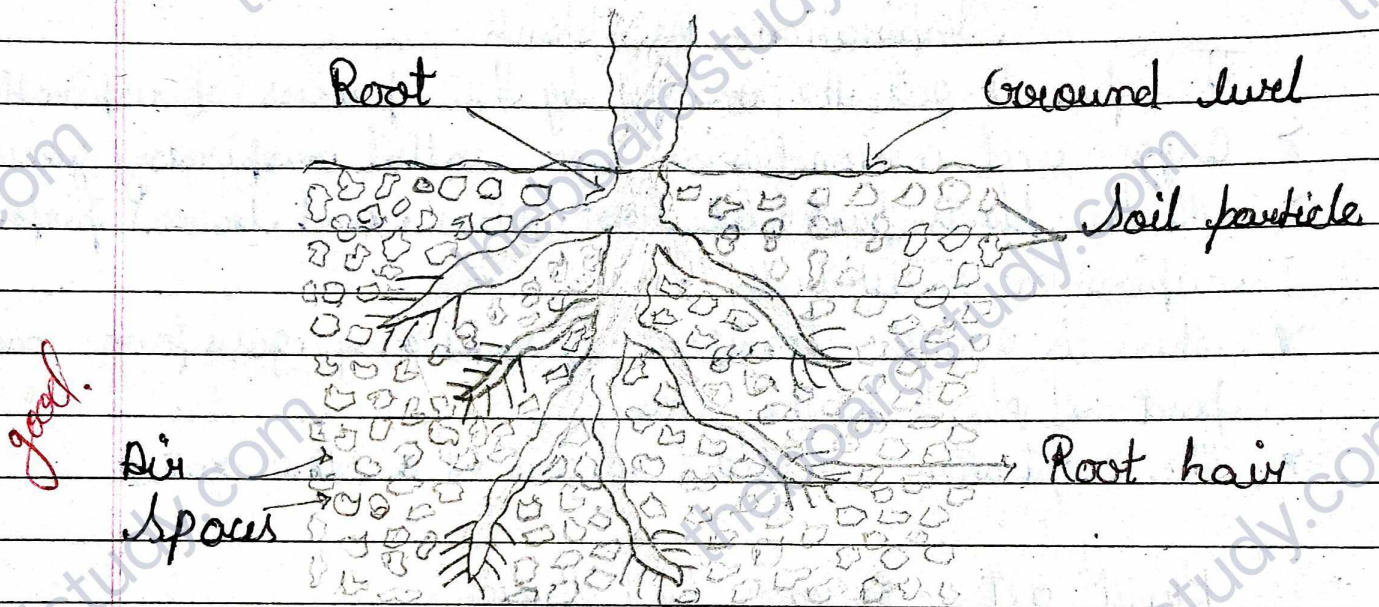
Diffusion alone can supply all the cells of the plants with as much oxygen as they need for respiration. Diffusion occurs in the roots, stems, and leaves of plants.

Respiration in roots.

Air is present in-between the particles of soils. The roots of plant take respiration in between the soils.

- The extensions of the epidermal cells of a root are called root hair.
- The root hairs are in contact to the soil particles.
- Oxygen diffuses into root hairs and reaches all the other cells of the root for respiration.

Carbon dioxide produced in the cells of roots during respiration moves out through the same root hairs by the process of diffusion.



Roots absorb oxygen from air present in between the soil particles through the root hair.

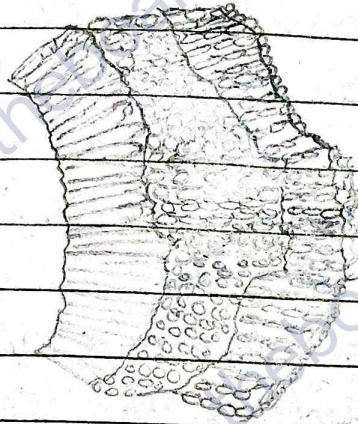
Respiration in stems

The stems of herbaceous plants (or herbs) have stomata. So the exchange of respiratory gases in the stem of herbaceous plants takes place through stomata.

The hard and woody stems of big plants or trees do not have stomata. In woody stems, the bark has lenticels for gaseous exchange.

The oxygen from air diffuses into the stem through

Lenticles reacher all the cells of the stem for respiration.

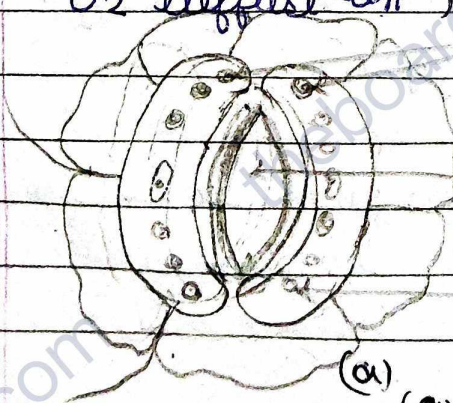


woody stem of plants have Lenticels.

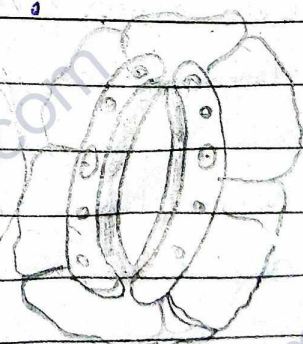
Respiration in Leaves.

- 1 The leaves of a plant have tiny pores called stomata.
 - 2 The exchange of respiratory gases in the leaves take place by the process of diffusion through stomata.
 - 3 Respiration in leaves occurs during the day time as well as at night.
 - 4 photosynthesis occur only during the day time.
- (i) The net gas exchange in leaves during day time is: O_2 diffuse out, CO_2 diffuse in.
- (ii) The net gas exchange in leaves during night time is O_2 diffuse in; CO_2 diffuse out.

Guard cells



Stomatal pore



Chloroplast

(a)

(b)

(a) open and (b) closed stomatal pore.

Respiration in Animals

Different animals have different modes of respiration. for examples:

- (i) In simple unicellular animals like Amoeba, respiration take place by the simple diffusion of gases through the cell membrane.
- (ii) The animals like Earthworm which live in the soil use their skin to absorb oxygen from air and remove carbon dioxide. The respiratory organ of Earthworm is skin.
- (iii) The aquatic animals like fish have gills as the respiratory organs.
- (iv) In the insects like grasshopper, cockroach, housefly and a mosquito the tiny holes called spiracle on their body and the air tubes called trachea are the respiratory organ.
- (v) The respiratory organs of the land animals such as man, birds, lizard, dog and frog are the lungs.

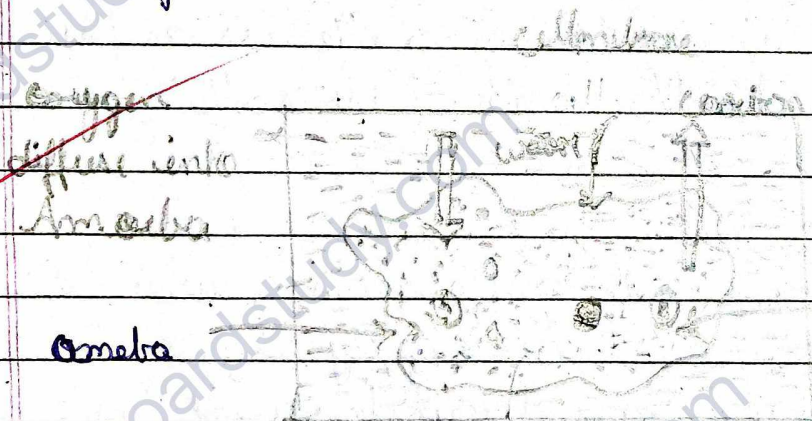
• All the respiratory organs (whether skin, gills, trachea, or lungs) have three common features.

- (i) All the respiratory organs have a larger surface area to get enough oxygen.
- (ii) All the respiratory organs thin walls for easy diffusion and exchange of respiratory gases.

- (iii) All the respiratory organs like skin, gills and lungs have rich blood supply for transportation of respiratory gases.

Respiration In Amoeba

- > Amoeba obtains an simple diffusion of gases for breathing.
- > The exchange of gases in Amoeba takes place through its cell membrane.
- > It present in water, the oxygen is dissolved in water.
- > The oxygen from water diffuse into the body of Amoeba through its cell membrane.



Respiration uses oxygen and produces carbon Dioxide

Human Respiration

- * Human Beings are air breathers. Air contains Oxygen.
- * The oxygen helps to break down the food absorbed in the body and release energy. This energy is used for maintaining the life.
- * The process by which energy is released from food in our body is called respiration.

Carbon dioxide and water are two by products of respiration.

- * The function of respiratory system is to breathe in oxygen for respiration (producing energy from food), and to breathe out carbon dioxide produced by respiration.
- * The breathing organs of human beings are lungs.
- * The gases exchanged between blood and air are oxygen and carbon dioxide.
- * Breathing is the process by which air rich in oxygen is taken inside the body of an organism and air rich in carbon dioxide is expelled from the body (with the help of breathing organs called lungs).
- * A breath means one inhalation plus one exhalation i.e. 'breath in' air to supply oxygen to the cells of our body (for the breakdown of food to release energy) and we 'breath out' to remove waste products carbon dioxide from our body (produced during the breakdown of food in the cells).

Process of our Breathing.

Lungs are connected to our nostrils (holes in the nose) through nasal passage (or nasal cavity) and windpipe. When we inhale air, it enters our

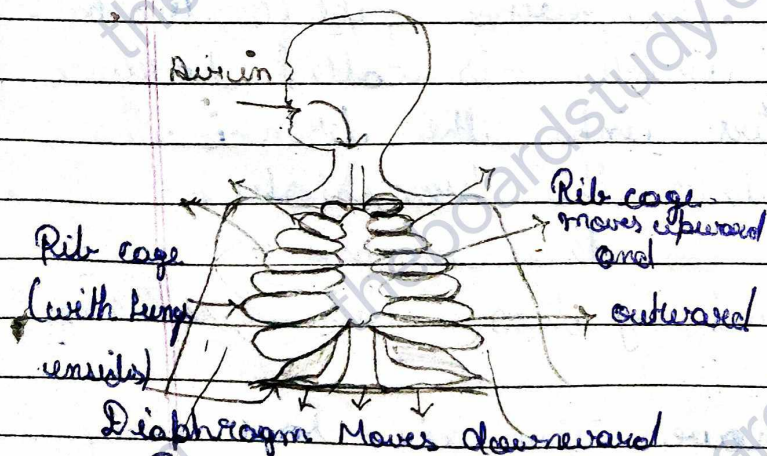
nose, pass through nasal passage (or nasal cavity) and windpipe. When we inhale air, it enters our nostrils, passes through nasal passage and windpipe and reaches our lungs.

- * Our two lungs hang in an airtight space in our body called 'chest cavity'.
- * At the bottom of the chest cavity is a curved sheet of muscle called diaphragm.
- * Breathing involves the movements of the rib cage and the diaphragm.

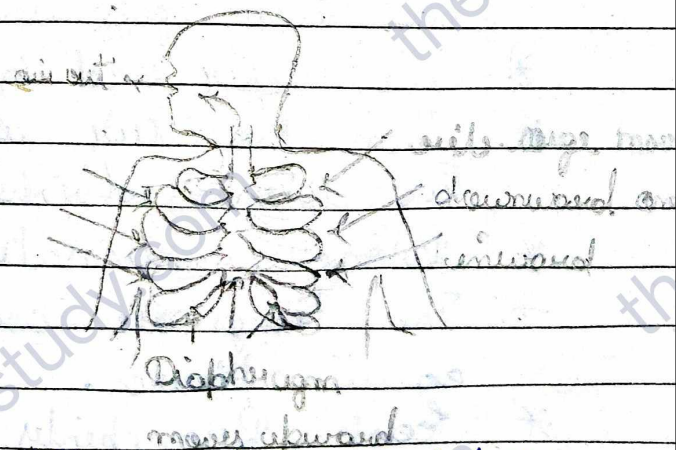
(a) Breathing in: When we breathe in (or inhale), then two things happen at the same time:

- (i) The muscles between the ribs contract causing the rib cage to move upward and outward.
- (ii) Diaphragm contracts and moves downward. Increase the space in the chest cavity and make it larger.

* As the chest cavity becomes larger, air is sucked in from outside into the lungs.



a) Breathing in: Chest cavity becomes bigger; air is sucked into lungs.



b) Breathing out: Chest cavity becomes smaller; air is forced out of lungs.

- b) Breathing out: When we breathe out (or exhaled), even then two things happen same time.
- The muscles between the ribs relax causing the rib cage to move downward and inward.
 - Decrease the space in our chest cavity and make it smaller.
- * As the chest cavity becomes smaller, air is pushed out from the lungs.

Respiratory System in Humans (or Man)

- * The main organs of human respiratory system are: -
Nose, Nasal passage (or Nasal cavity), Trachea, Bronchi, Lungs and diaphragm.
- * In human beings air is taken into the body through the nostrils.
- * The air passing through the nostrils is filtered by fine hairs that line and mucus by the glands.
- * The part below the wind pipe and Throat is called pharynx.
- * From the nasal passage air enters into pharynx and then goes into the wind pipe (or trachea).
- * The upper end of trachea is called larynx.
- * Then the air enters into the bronchi. The two bronchi divide into the bronchioles.
- * Bronchi connected to the lungs.
- * The lungs are covered by two thin membrane called pleura.
- * Each Bronchioles have tiny air-sacs they

are present on the smallest bronchioles are called Alveoli.

* The air enters Bronchioles through the Alveoli.

Alveoli

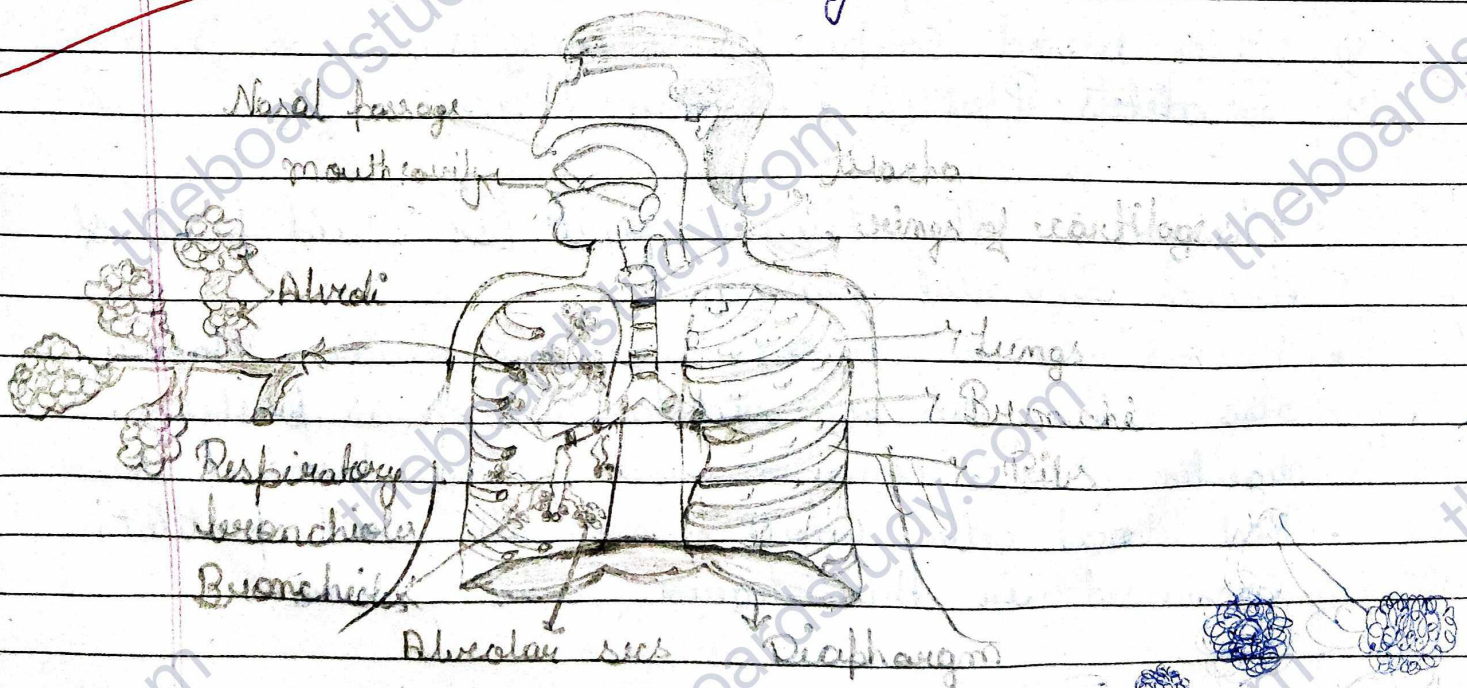
* Balloon-like or sac-like structure

* Walls of alveoli are only one cell thick and provided a surface where the exchange of gases can take place.

* Contain an extensive network of blood-vessels which help in exchange of gases can take place.

Alveolar • Exchange gases.

The blood brings CO_2 from the rest of the body for release into the alveoli, and the oxygen in the air alveolar air is taken up by blood in the alveolar blood release vessels to be transported to all the cells in the body.



Transportation

In Everyday language, 'transport' means to carry things from one place to another.

In Biology, transport is a life process in which a substance absorbed (or made) in one part of the body of an organism is carried to other parts of its body.

In Human Circulatory System: ① Blood ② Blood vessel ③ Heart.

- Blood is a red coloured liquid which circulates in our body. Blood is red because it contains a red pigment called haemoglobin in its red cells.

- It is a connective tissue.

The main components of blood are:

- 1) Plasma
- 2) Red blood corpuscles (or Erythrocytes)
- 3) White blood corpuscles (Leukocytes)
- 4) ~~Platelets~~ Platelets (Thrombocytes)

Plasma :- The liquid part (or fluid part) of blood is called plasma.

- Plasma consist about 90 percent water. Plasma also contain dissolve substance such as proteins, digested food, common salt, waste product etc.
- Red Blood cells, white blood cells and platelets immersed in this liquid called plasma.

Red Blood cells.

Red Blood cells carry oxygen from the lungs to all the cells of the body. do not nuclei present in it. Red due to Hemoglobin. Hemoglobin contain iron and transport oxygen.

White Blood cells.

White blood cells fight infection and protect us from diseases. Some WBC eat germs (like Bacteria) which cause disease.

Others WBC make chemicals known as 'antibodies' to fight against infection.

It is soldiers of our body.

Two Types of WBC.

① Granulocyte

Present Granule

① Neutrophils

② Eosinophils

③ Basophils

② Agranulocyte

Absence Granule

① Lymphocyte

② monocyte

Platelets

Do not have nuclei. Platelets help in the coagulation of blood (or clotting of blood) in a cut or wound. clotting with the help of fibrin protein.

Injury $\rightarrow$ Loss of Blood $\rightarrow$ Blood pressure decrease

or affected.

Efficiency of transportation of substance will decrease.

In Blood circulatory system, the blood flows through three types of blood vessels:

- (i) arteries
- (ii) veins
- (iii) capillaries.

Arteries :-

- Arteries are the thick walled blood vessels which carry blood from the heart to all the parts of the body.
- The thick walls because blood emerges from the heart under high pressure.
- found in whole body. The main artery (called aorta) is connected to the left ventricle of the heart.
- It carry oxygenated blood from away from the heart. another artery pulmonary is carry deoxygenated blood.

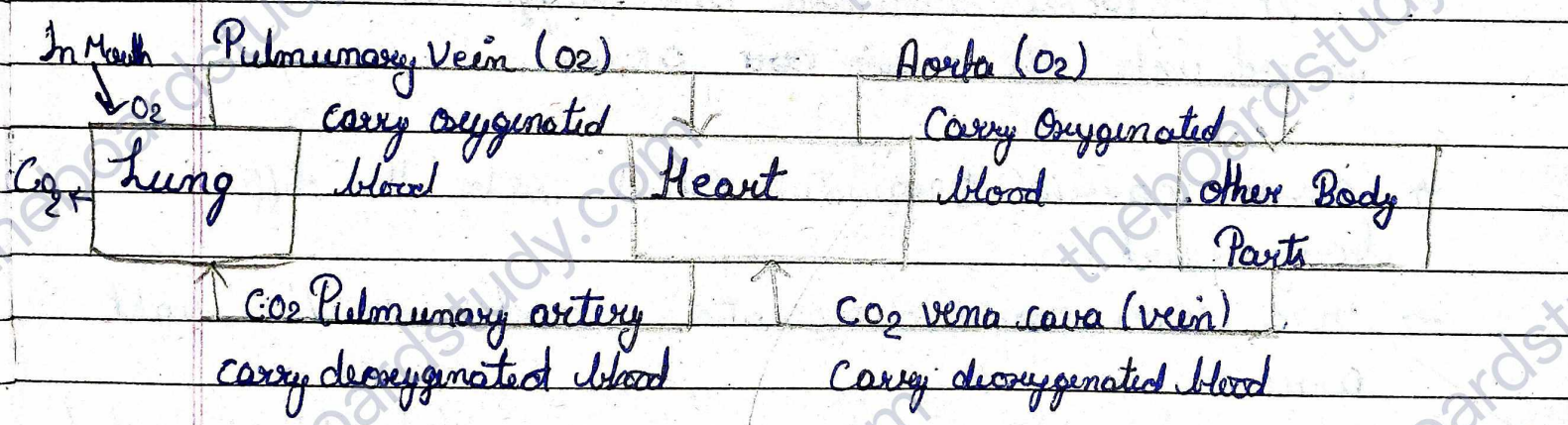
Veins :-

- Veins are thin walled blood vessels which carry blood from all the parts of the body back to heart.
- Veins do not need thick walls because the blood flowing through them is no longer under high pressure.
- pulmonary vein carries oxygenated blood from lung to heart.
- The main vein (called vena cava).

- The vena cava carries deoxygenated blood from all the parts of the body (except lungs) back to the heart.
- It carries blood towards the heart.

Capillaries :-

- The capillaries are thin walled extremely narrow tubes or blood vessels which connect arteries to veins.
- The walls of capillaries are only one-cell thick.
- The exchange of various material like oxygen, food, carbon dioxide, etc, between the blood and the body cells takes place through capillaries.



The Heart (Our pump)

- The heart is roughly triangular in shape.
- It is made of special muscle called cardiac muscle.
- As big as fist.
- The heart has four compartments called 'chambers' inside it.

→ The upper two chambers of heart are called atria (singular atrium) and the lower two chambers of heart are called ventricles.

→ The job of heart is to pump around our body.

→ When the muscles of all the four chambers of the heart are relaxed, the pulmonary vein brings the oxygenated blood from the lungs into the left atrium of the heart.

→ Left atrium contracts the oxygenated blood is pushed into the left ventricle through valve ①.

→ Left ventricle contracts the oxygenated blood is forced into the ~~main~~ aorta.

→ Aorta carries oxygenated blood into the different body part.

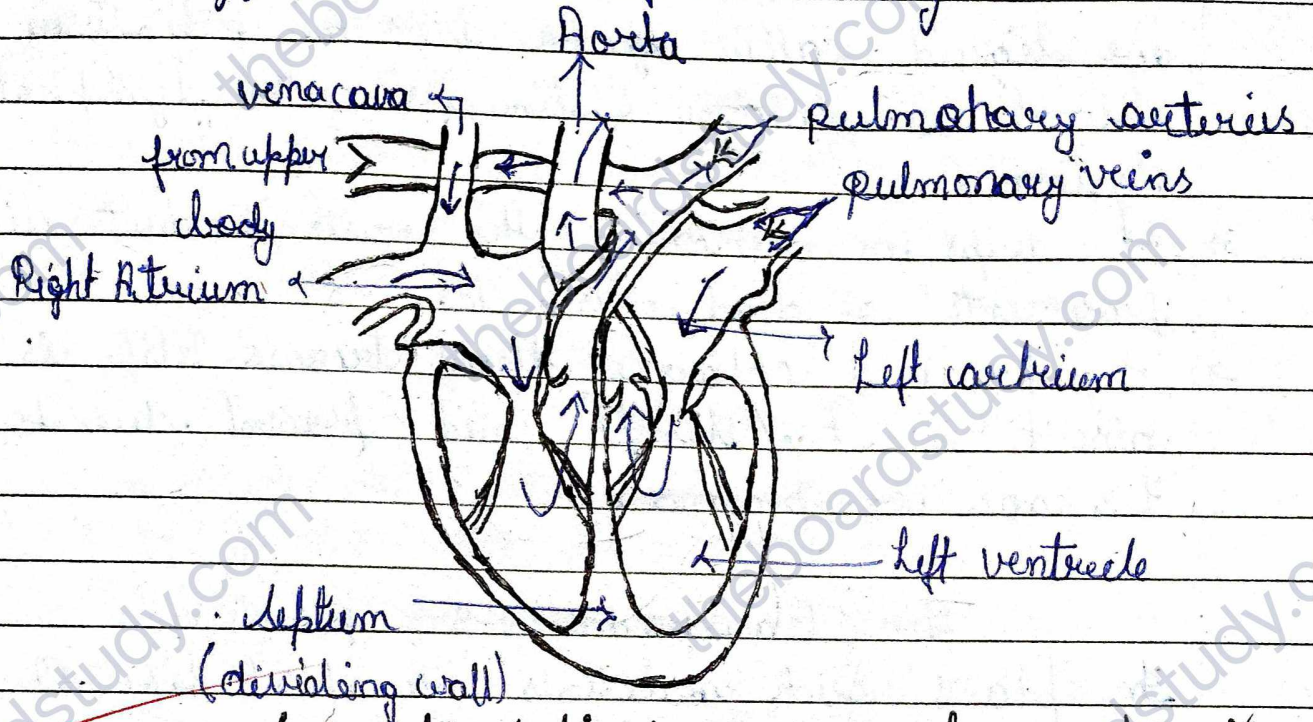
→ Vena cava carries deoxygenated blood into the right atrium.

→ The right atrium contracts deoxygenated blood pushed into the right ventricle through Valve ②.

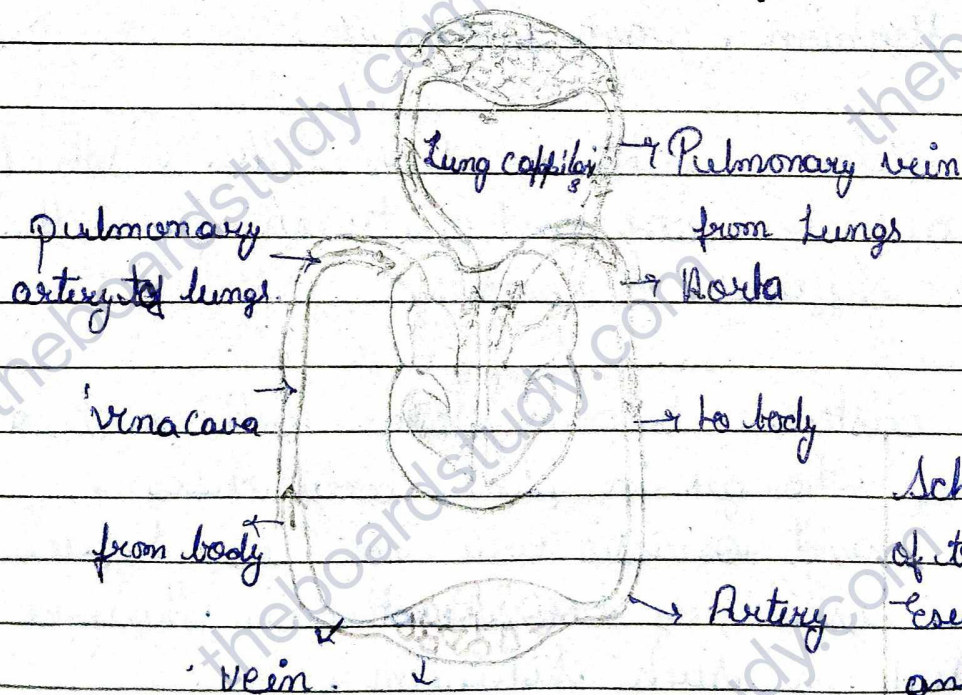
→ And when right ventricle contracts deoxygenated blood enters into the lungs.

→ A circulatory system in which the blood travels twice through the heart in one complete cycle of the body is called double circulation.

- The separation of the right side and the left side of the heart is useful to keep oxygenated and de-oxygenated blood from mixing



Schematic sectional view of the human heart



Schematic representation of transport and exchange of oxygen and carbon dioxide.

Capillaries in body organ apart from the lungs.

Lymph (Lymphatic System)

A system of tiny tubes called lymph vessels and lymph nodes in the human body which transports the liquid called lymph from the body tissue to the blood circulatory system is called lymphatic system.

- * It helps in removing the waste products like fragments of dead cells, etc.
- Lymph is a colourless fluid because RBC is absent in it. Lymph fluid formed due to leakage of plasma.

Transportation in plants.

In plants such materials transport like Oxygen, water, minerals (Nitrogenous waste), carbon dioxide, food, Hormone, waste product etc.

If the distance between two cells is small root hairs absorb water and nutrients from the soil through diffusion & osmosis.

If the distance becomes large between two cells because of changes in plant body design. Diffusion and osmosis will not be sufficient. A proper system of transportation is therefore essential in such situation.

Transport system → vascular system

→ Vascular Bundles →

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→ Vascular tissue → ① Xylem ② Phloem.

Why plants have slow transport system?

- plants do not move
- plants bodies have a larger proportion of dead cells in many tissues.
- Therefore plants have low energy needs which means no rush to transport water and food at faster rate.

Transport of water & minerals via Xylem.

Ascent of sap - The upward movement of water and minerals from the root to the upper part of the plant against the gravity via xylem tissue is called ascent sap.

* No energy is utilised

It is made up of four types of elements :-

It is a complex permanent tissue

- | | | | |
|---|-------------|------------------|--------------------|
| ① vessels | ② Tracheids | ③ Xylem fibres | ④ Xylem parenchyma |
| main water conducting tubes or channels (Support) | | (Living storage) | |
| Dead | | Dead | |

It is a Dead tissue, It is a unidirectional (upward flow of water and minerals). Roots to apical (tip of plant).

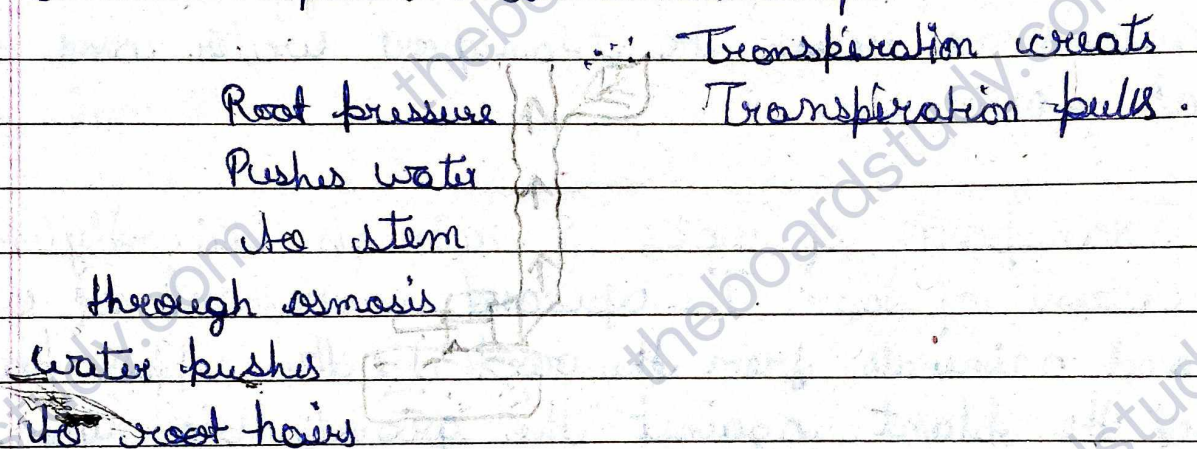
→ water present in ground soil & roots absorb this water with the help of root hairs & water comes into root cells & water pulled by xylem & upward movement of water →

To the cells in the leaves $\rightarrow$ Diffusion through the stomata in leaves.

The forces that contribute to ascent of Sap are as follows:

(i) Root pressure.

(ii) Transpiration or suction pull



(i) Root pressure: When water enters into root cells by the process of osmosis a pressure is generated in the roots which helps in transporting the water and other ions from the soil in upward direction into the xylem. This hydrostatic pressure is known as root pressure.

$\rightarrow$ Transpiration: Loss of water in form water vapour from the surface of the leaf.
It also helps in temperature regulation.

(ii) Suction pull: When water is lost from the surface of leaves due to the process of transpiration a pulling force is developed inside the xylem.

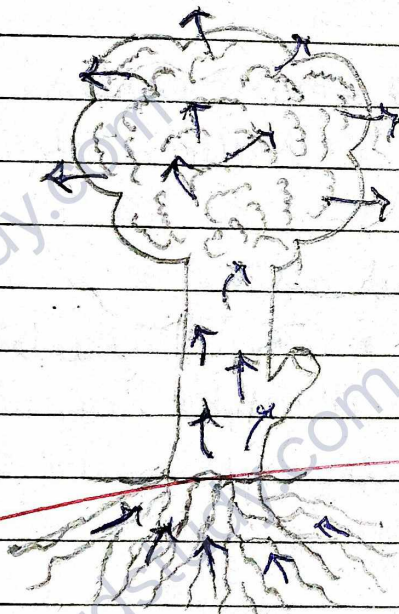
tissue. This pulling force is known as transpiration pull. This force helps in the upward movement of water in xylem from root to the leaves.

Day time

- Stomata open more transpiration
- And more photosynthesis
- Root absorb more water

Night time

- Stomata closed no transpiration
- No photosynthesis
- Root does not absorb water



← Transpiration in day Time

← Through the sunlight & water vapourise

Transport of food via xylem phloem

Translocation: The upward and downward movement of photo assimilates (food) from leaves to other part of the plant via phloem tissue is called translocation.

Energy ATP is used.

It is made up of five types of Element:-

- ① Sieve tube
- ② Sieve cells
- ③ Companion
- ④ Phloem parenchyma

Living

③ phloem fiber (diac) Support.

Transport of substance in phloem occurs both upward and downward (Bidirectional)

Excretion

The process of removal of toxic wastes from the body of an organism is called excretion.

Excretion in Animals.

1 In Amoeba :- The waste material carbon dioxide is removed by diffusion through the cell membrane, but nitrogenous wastes and excess water are removed by the contractile vacuole.

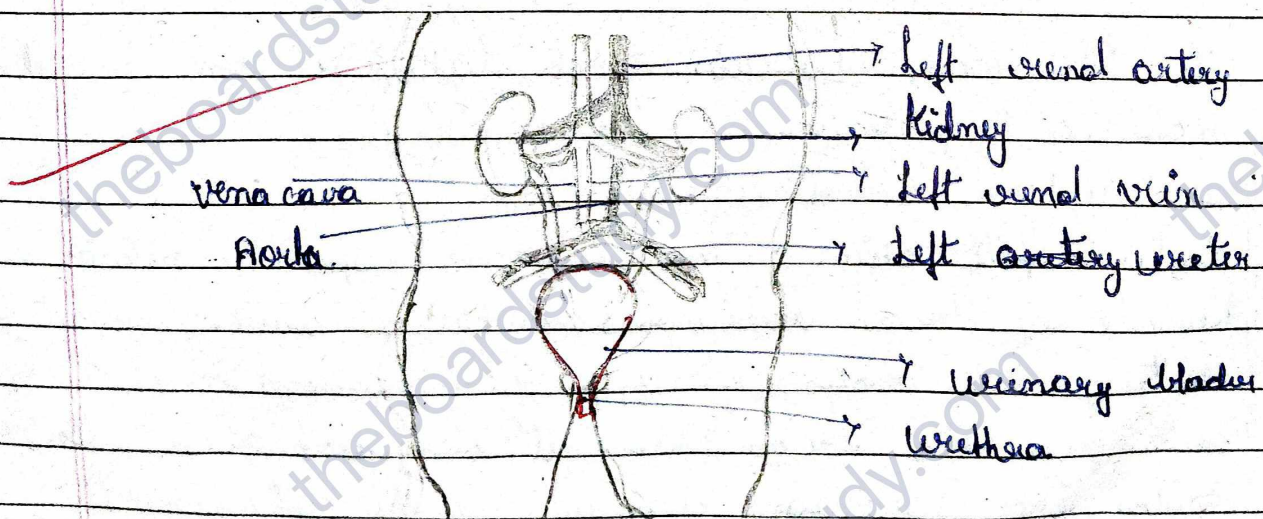
2 In Human beings :- The microscopic thin tubules form nephron, which function as excretory unit. About 1 million nephrons taken together form the excretory organ of human beings called kidney.

- Major waste product by the human are: carbon dioxide and urea.
- Our lungs excrete carbon dioxide.
- Our kidneys - excrete urea.

Main organs of excretory system is :- Two kidneys, Two ureters, Bladder and Urethra.

The renal artery (or kidney artery) brings in the dirty blood into the kidneys.

- Kidneys clean our blood by filtering it to remove unwanted substance present in it.
- The renal ^{vein} ~~artery~~ carries clean blood away from the kidney.
- The renal artery carries dirty blood away together from the kidney.
- Ureters are the tubes which carry urine from each kidney to the bladder.
- Urine is stored in the bladder (It is bag which stores urine till we go to the toilet).
- Urine passed out from the body through the urethra.



Why urine is produce?
To get rid of harmful metabolic waste from body

How urine is produce?
Urine produce during filtration of blood in kidney

Kidney

Each kidney made up of a large number of Excretory units called Nephrons.

Nephron is structural & functional unit of kidney.

Nephrons

① Cupshaped ② Tubular part ③ collecting duct

Nephrons has a cup shaped bag. Its upper part is Bowman's capsule. Lower part of Bowman's capsule is tube shaped and it is called a tubule.

★ The Bowman capsule and tubule taken together make a nephron.

→ In nephron blood filtered

→ Glomerular filtration :- The Bowman's capsule contains a bundle of blood capillaries which is called glomerulus.

→ Nitrogenous wastes, glucose, water, amino acid excessive salts from the blood are filtered and initial filtrate enters into Bowman's capsule of the nephron.

→ This waste collected into Bowman's capsule.

Selective reabsorption

Useful substances like glucose, amino acids, salts and a major amount of water from the filtrate are reabsorbed back by capillaries surrounding the nephron.

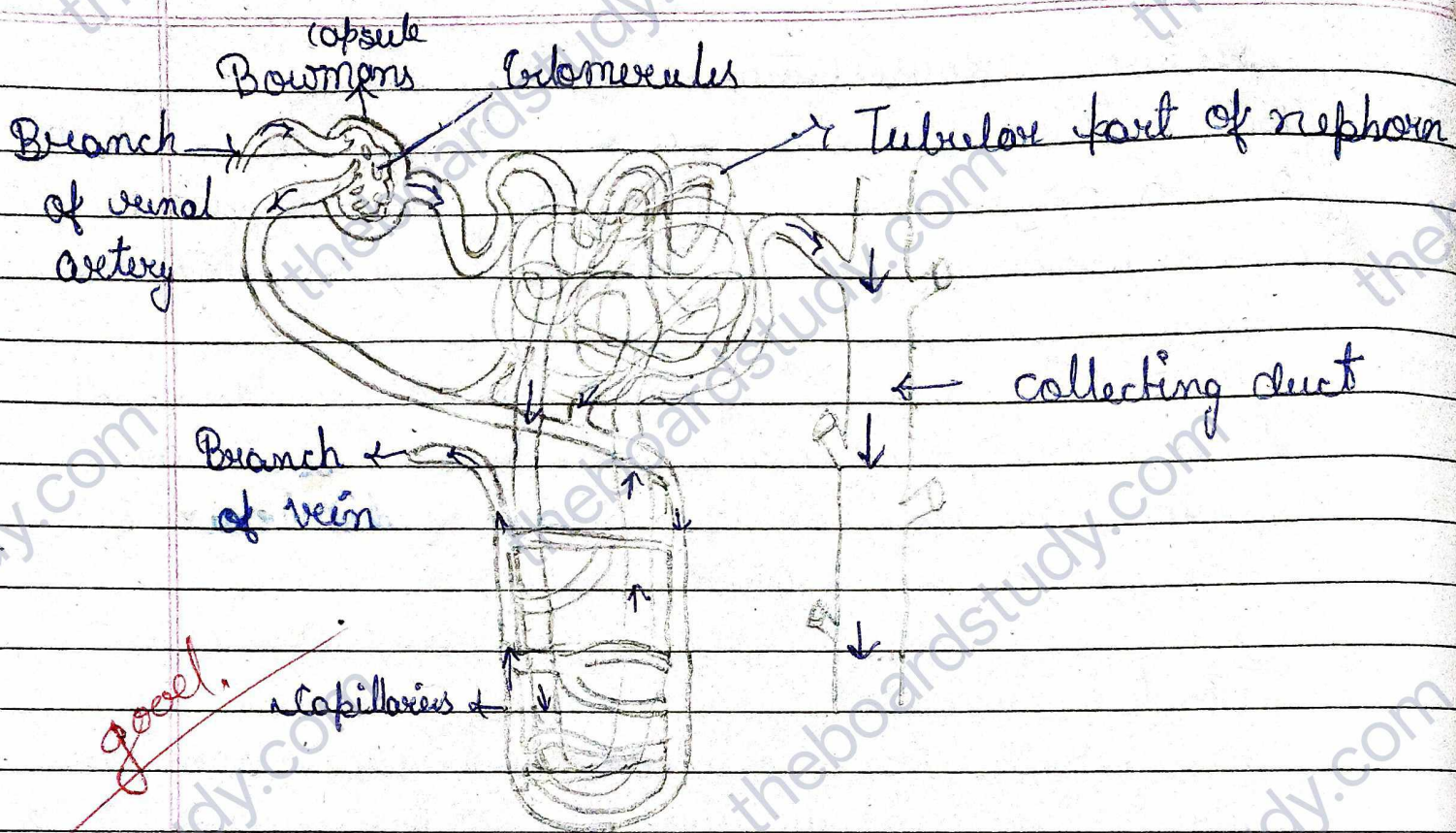
Note:- The amount of water re-absorbed depends on how much excess water and dissolved salts are in the body and on how much of dissolve waste there is to be excreted.

② Tubular secretion

Urea, extra water and salts are secreted into the tube which open up into the collecting duct & then into the ureter.

Micturition:- micturition or urination is the process of expelling* urine out of the body. * Removing outside.





Structure of a nephron

Excretion in plants.

- The plants produce waste products very slowly and in very small amounts.
- They have no specific organ ^{for waste removal} like human beings.

The main waste product produced by plants are carbon dioxide, water vapour and oxygen.

Carbon dioxide ~~for~~ during respiration.

Oxygen during photosynthesis.

water by transpiration

gases removed through the stomata in leaves and lenticels in stems and released to the air.

The plant also store some of the waste product in their body parts.

Example :- Some of the waste product collect in leaves & bark and fruits of the plant (or tree).

The plants get rid of these waste by shedding of leaves, peeling of bark and falling of fruit.

Some of the plant waste get stored in the fruits of the plant in the form of solid bodies called sclerites.

The plants get rid of waste by secreting them in the form of gums and resins.

The plant also secrete some waste substance into the soil around them.