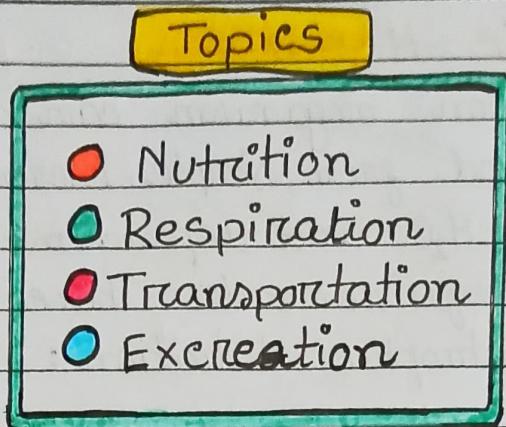


LIFE PROCESS

08/05/2021

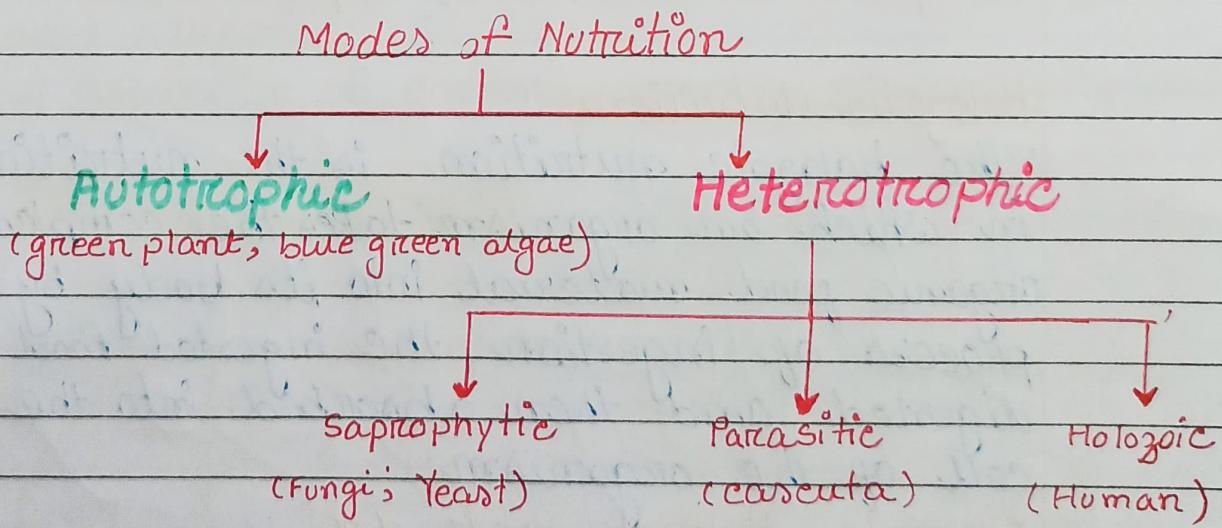


■ what is life process?

The basic function performed by living organism to maintain their life on this earth are called life process.

NUTRITION

Nutrition is the process of intake of nutrients by an organism as well as utilization of the nutrients by the organism.



Autotrophic Nutrition

In this mode of nutrition organism mainly green plant and few bacteria synthesizes their food from simple inorganic material like $\text{CO}_2, \text{H}_2\text{O}$.

Heterotrophic Nutrition

In this nutrition organism can not make their own food from simple inorganic material like CO_2 and H_2O and depend on other organism for its food requirement. There are three types of heterotrophic Nutrition:

Saprophytic Nutrition

In this mode of nutrition organism obtains its food from decaying organic matter dead plants, dead animals and rotten bread. Example: Mushroom, fungi, yeast etc.

Parasitic Nutrition

Parasitic nutrition is that nutrition in which an organism derives its food from the body of another living organism (host) without killing it. Example: Casceta, lice, tapeworms.

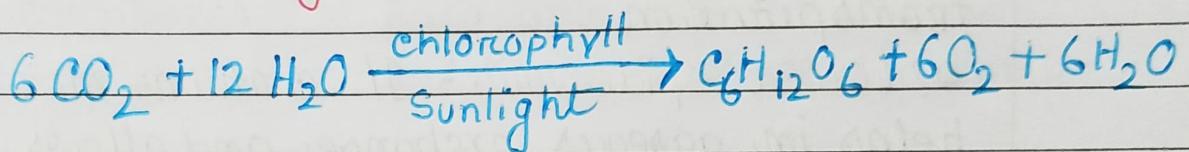
Holozoic Nutrition

The holozoic nutrition is the nutrition in which an organism takes the complex organic food material into its body by the process of ingestion, the ingested food is digested and then absorbed into the body cell of the organism.

Example: Human, cat, dog

Nutrition In Plants

The process by which green plants make their own food from carbon dioxide and water in the presence of sunlight and chlorophyll is called photosynthesis.

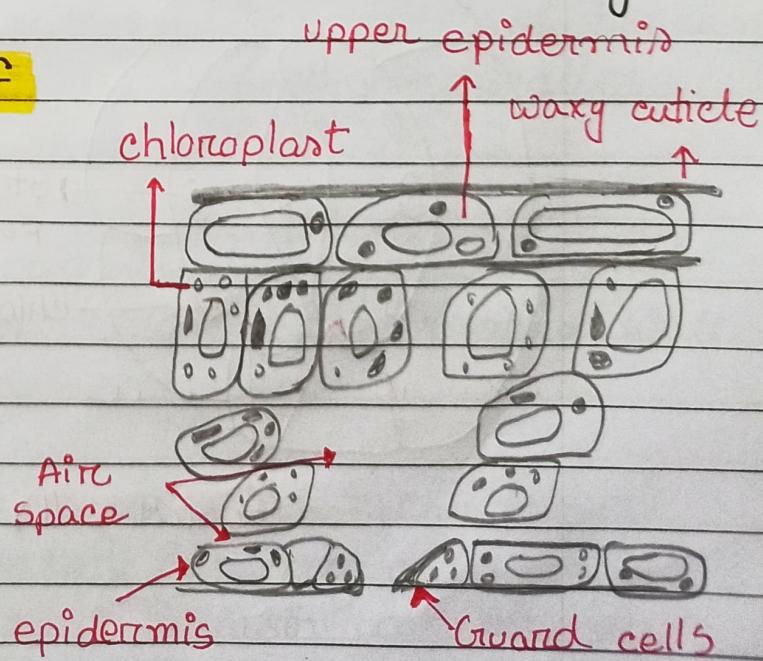
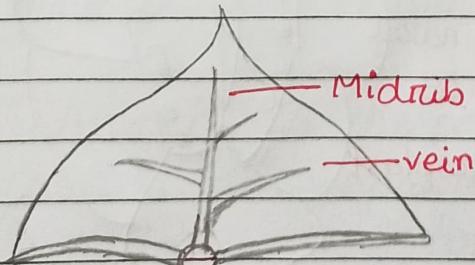


The produced glucose are utilised for providing energy to the plant and the rest which are not used immediately are stored in the form of starch which is used later by the plant.

Process of photosynthesis occurs in given steps:

- i) Absorption of light energy by chlorophyll
- ii) Conversion of light energy to chemical energy and splitting of water molecules into hydrogen and oxygen.
- iii) Reduction of carbon dioxide into carbohydrates

Structure of leaf



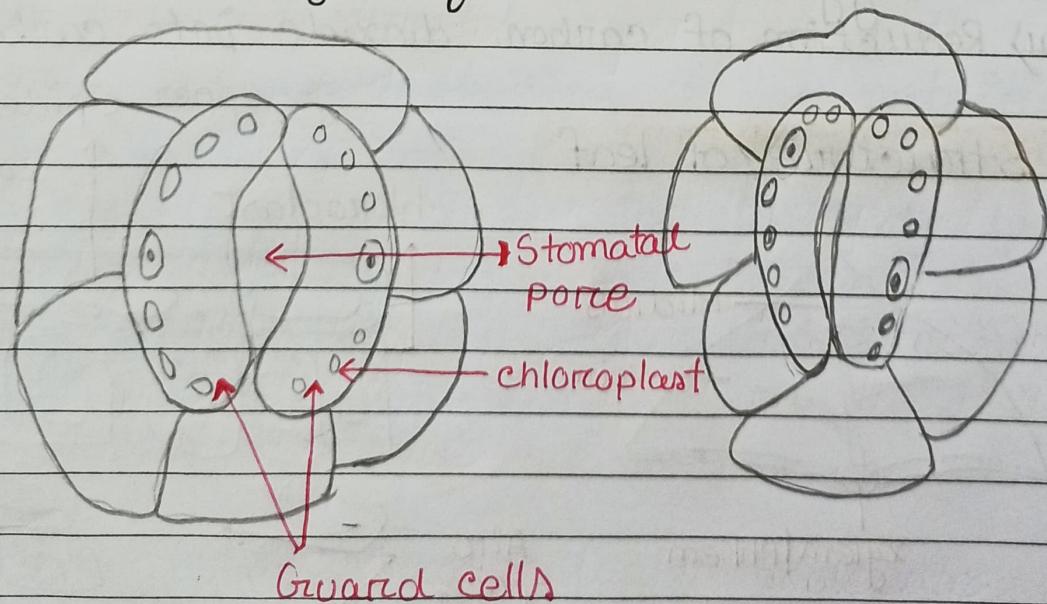
1) **Epidermis** - The outermost layer of leaf is called epidermis. They are two types:

a) **upper epidermis** - It is a single layer of transparent cell with no chloroplast. It is basically covered by a waxy cuticle which protects internal leaf tissue by preventing excessive loss of water through transpiration.

b) **Lower epidermis** - It contains stomata and helps in gaseous exchange and allows the oxygen to go out.

ii) **Stomata** - These are tiny pores mostly found in lower epidermis of plants which allow gases to enter and exit in the leaf more faster.

iii) **Guard cells** - These are bean shaped cells that frame the stomatal opening hence they control the rate of diffusion of water and gases in and out of leaf.



Nutrition In Animals

Animal obtain their food from plant and other animals and on the basis of their food habit they are of three types:

- ① Herbivores - Eats only plants
- ② Carnivores - Eats only other animals
- ③ Omnivores - Eats both plants and animals

Steps in the process of nutrition

1) **Ingestion** - It refers to taking in food. When food is entered into mouth it mixes with saliva and with the help of muscular tongue and teeth the food particles are being broken down into smaller particles.

2) **Digestion** - Food is complex in nature to convert it into absorbable form of body it breaks down with the help of some biological catalyst called enzymes. This process of breaking down of large organic molecule to smaller molecule is called digestion.

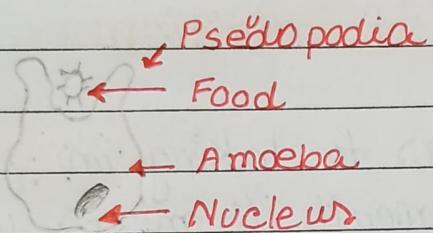
3) **Absorption** - The process in which the digested food is taken / passes through the intestinal wall is called absorption.

4) **Assimilation** - The process in which the absorbed food is taken in by body cells and used for energy growth and repair.

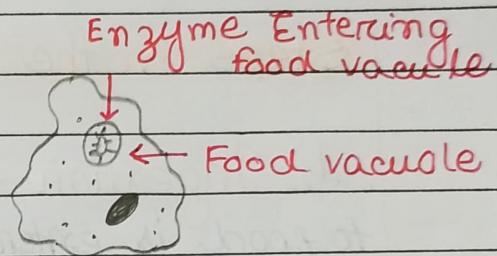
Egestion - The process in which the undigested food is removed from the body is called egestion.

Nutrition in Amoeba

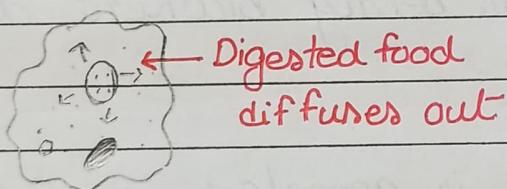
Amoeba is an unicellular organism that does not have any specialised organ for the process of nutrition. This is a holozoic mode of nutrition.



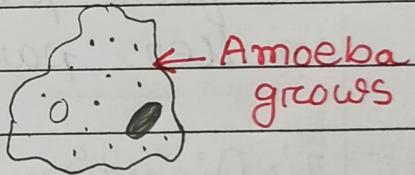
i) Ingestion



ii) Digestion



iii) Absorption



iv) Egestion

i) Ingestion Amoeba ingest food with the help of pseudo podia

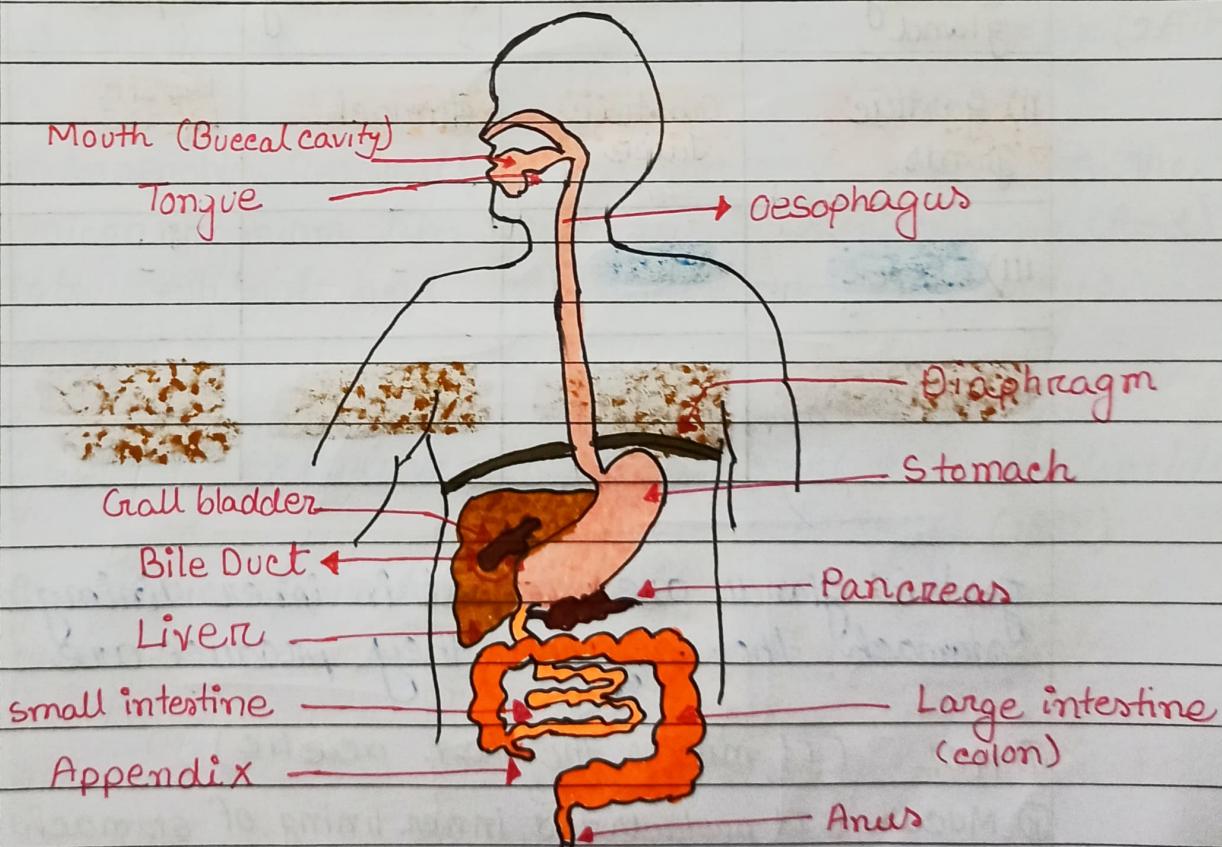
ii) Digestion In Amoeba, food is digested in the food vacuole by digestive enzymes. The enzyme from surrounding cytoplasm enter into the food vacuole and break down the food into soluble molecule

iii) Absorption Small soluable molecule are absorbed by cytoplasm

iv) Assimilation The absorbed is further assimilated by amoeba to use energy for growth

v) Egestion The undigested food material is removed by cell membrane which ruptures at any place of the amoeba and eliminate out undigested food which is known egestion

Human Digestive System



Human alimentary canal

Digestive System

The various organs of the human digestive system in sequence are Mouth → oesophagus → stomach → small intestine and large intestine → Anus.

The glands which are associated with human digestive system and form a part of the human digestive system are: salivary gland, Liver, Pancreas

Glands & Their Secretion

Glands	Secretion	Site	Enzyme	Acts on
I) Salivary gland	Saliva	Buccal cavity	Salivary amylase	Starch
II) Gastric glands	Gastric Juice	Stomach	Pepsin Lipase	Protein Lipase
III) Liver	Bile	-	-	Fats
IV) Pancreas	Pancreatic Juice	Small intestine	Trypsin Lipase	Protein Fat

Gastric glands are present in inner lining of stomach the enzyme they produce are

- ① HCL (It makes the food acetic)
- ② Mucus (It protects the inner lining of stomach from HCL)
- ③ Pepsin (It breaks the protein molecule into amino acid)

complete digestion takes place at Small intestine

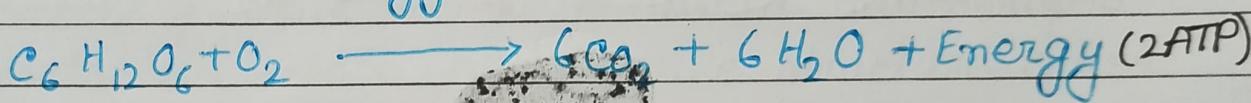
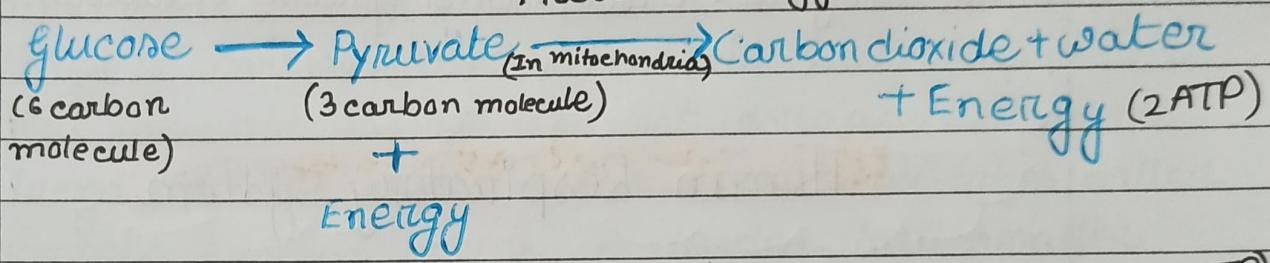
RESPIRATION

The process respiration involves taking in oxygen to use it in the process of break down of food material and eliminating the waste products (CO_2 and water) from the body.

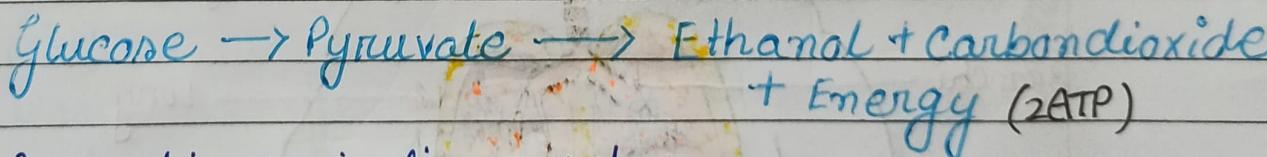
Respiration are two types:

i) Aerobic Respiration - The respiration which uses oxygen is called aerobic respiration

Presence of oxygen (Kreb's cycle)

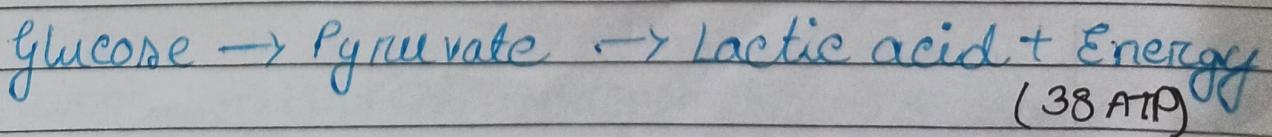


ii) Anaerobic Respiration - In anaerobic respiration the micro organism like yeast break down glucose (food) into ethanol and carbon dioxide and release energy.



Anaerobic respiration muscle

anaerobic respiration takes place in our muscle during vigorous physical exercise when oxygen gets used up faster in muscle cells than can be supplied in the body.



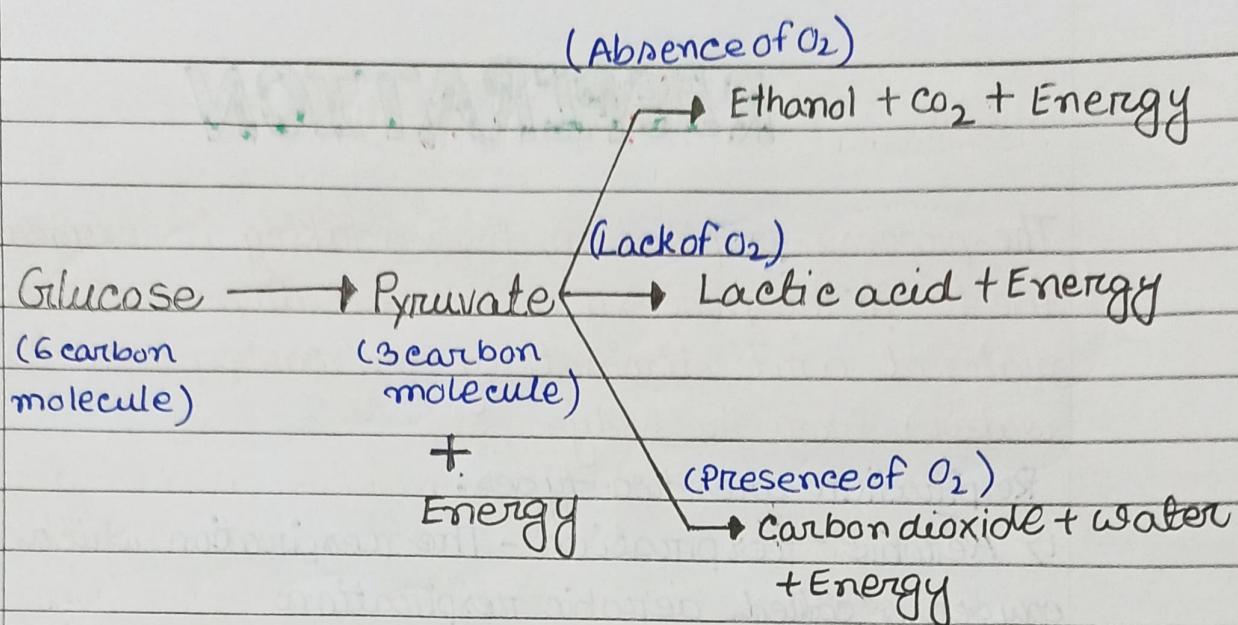
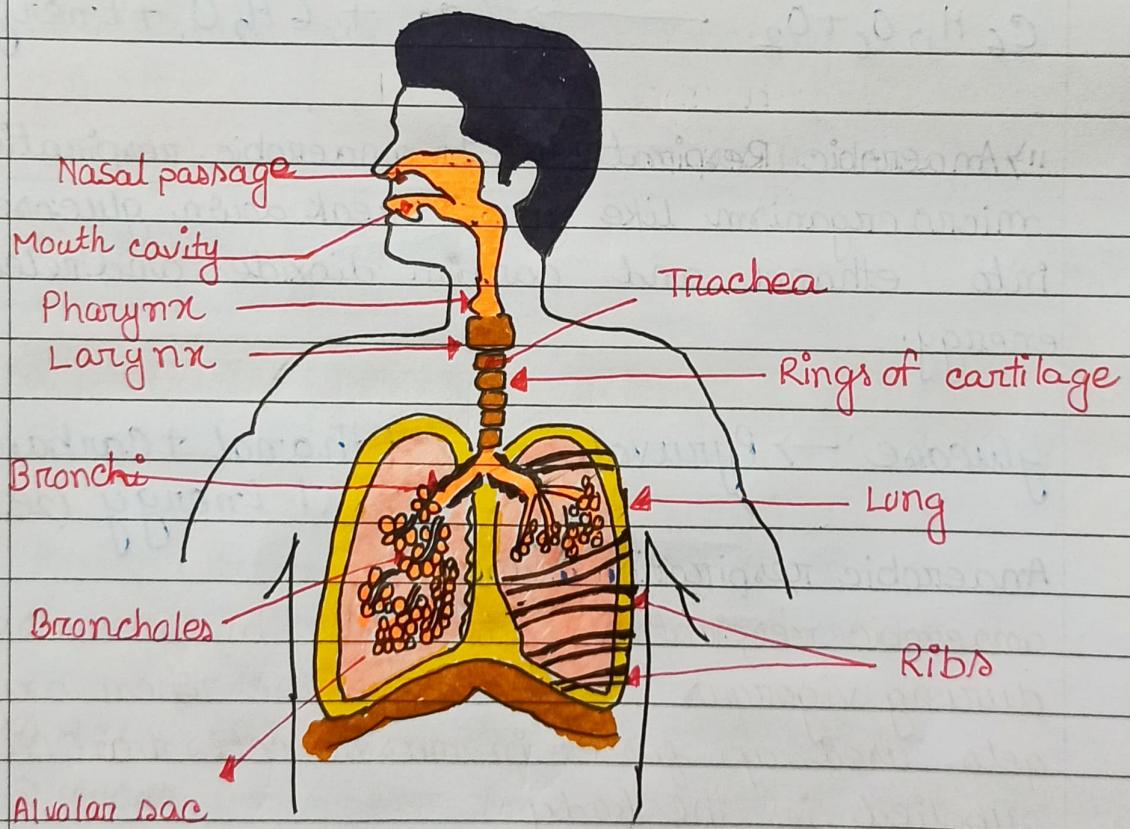
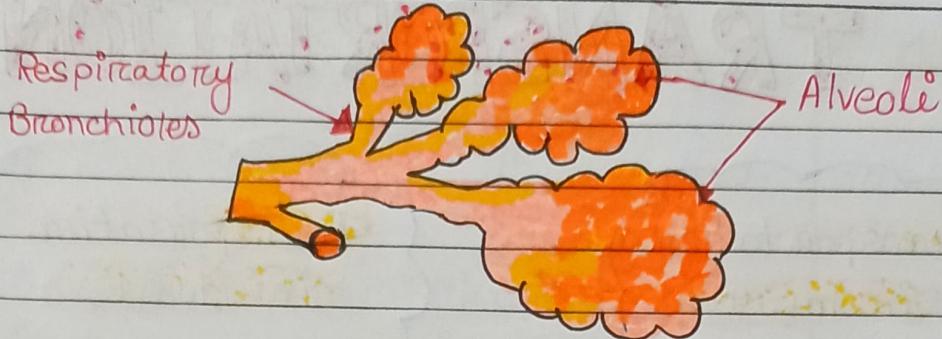


Figure : Breakdown of glucose by various pathway

Human Respiratory System





In human being air is taken into body through the nostrils. The air passing through nostrils is filtered by the hair that line the passage. From here the air passes through the throat and into the lungs. Rings of cartilage are present in throat. They ensure that the air passage does not collapse. Within the lungs the passage delivers two separate tubes called Bronchi. Further bronchi is divided into smaller parts and create balloon like structure called alveoli. The alveoli provides large surface area where the gaseous exchange takes place.

The Pathway of Air

Nostrils



Nasal passage



Pharynx



Larynx



Trachea



Lungs → Bronchi → Bronchioles → Alveoli → Blood

TRANSPORTATION

Transportation
in human

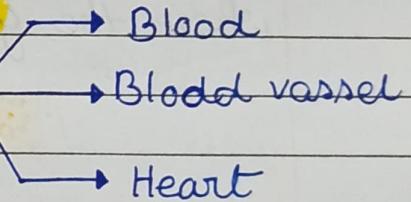
Transportation
in Plants

Translocation
movement of food
and other mineral
Phloem

Transpiration
transport of H₂O
and mineral
xylem

Transportation in Human being

- Blood circulatory system
- Lymphatic system



Blood circulatory system

Blood is a fluid connective tissue which helps in the transport of food, oxygen and waste material in our body. Blood consist of fluid medium called plasma where the blood cell are suspended.

RBC → (carries oxygenated blood)

WBC → (Protection against bacteria)

Platelets → (Helps in clotting of blood)

Arteries

- i) Thick walled
- ii) carries blood from heart to various organs.

veins

- i) Thin walled

- ii) Collect blood from different organ and bring back to heart

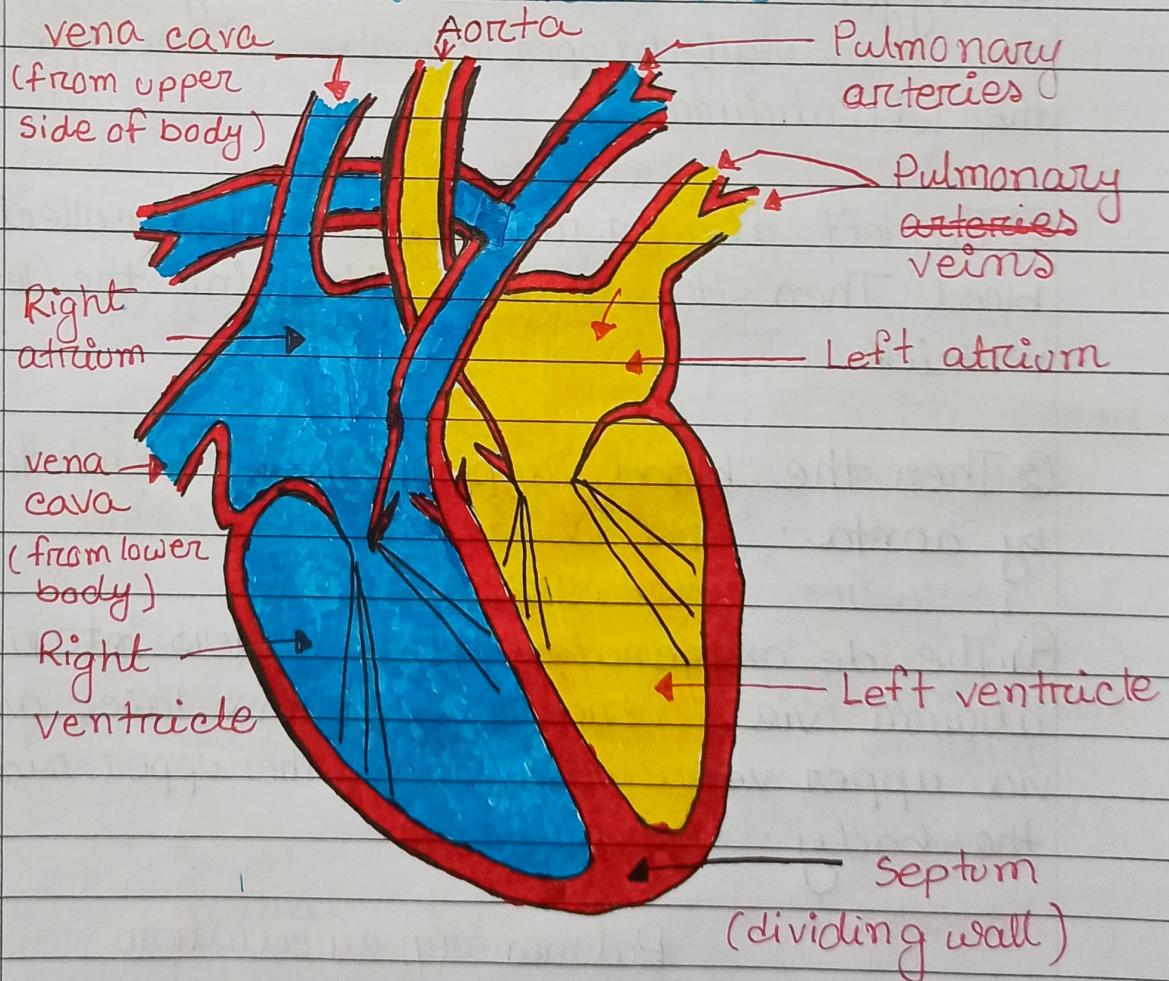
Capillaries

- i) only one cell thick

- ii) Helps in distribution of blood in cell.

Our Pump - Heart

Double circulation



Heart is a muscular involuntary organ which is as big as our fist. Heart is separated in 4 chambers. The main function of heart is to pump enough blood to deliver a continuous supply of oxygen and other nutrients to brain and other vital organs.

Chambers of heart

Right atrium

Left atrium

Right ventricle

Left ventricle

Circulation of blood through the Heart

① Systematic circulation

① Oxygen rich blood from the lungs comes to the thin walled upper chamber of heart on left the left atrium.

② The left atrium relaxes when it is collecting the blood. Then it pushes the blood into the left ventricle.

③ Then the blood is pumped out to whole body by aorta.

④ The de oxygenated blood enters into right atrium via vena cava from lower and via upper vena cava from the upper side of the body.

Pulmonary circulation

① From right atrium the blood moves to the right ventricle.

- ⑩ Right ventricle pushes the blood to the lungs for oxygenation via pulmonary arteries.
- ⑪ The oxygenated blood comes back to left atrium of heart through pulmonary veins
- ⑫ Then the left atrium pushes the blood again to the left ventricle.

Pulmonary circulation The pathway from the heart to the lungs and the blood back to the heart is called pulmonary circulation

Systematic circulation The pathway of blood from the heart to rest of the body and back to the heart is called systematic circulation.

Blood pressure

Systolic blood pressure

Diastolic blood pressure

contraction of Heart

Relaxed phase of heart

Normal

120 mm of Hg

Normal

80 mm Hg

LYMPH

Lymph is another medium of circulation in human body. It is a yellowish fluid which contains blood plasma along with WBC but no RBC.

Function of Lymph

- i) Transportation of digested fat
- ii) Lymph protects the body by killing the germs.
- iii) It takes up excess fluid that has diffused out from the blood capillaries and put it into the blood.
- iv) Lymph helps in removing waste products like fragment of dead cell etc.

EXCRETION

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

Excretion in Plants

The main waste products produced by plant are carbon dioxide, water vapour and water.

- i) The gaseous waste (O_2 and CO_2) are removed through Stomat in leaves and lenticels in stems.
- ii) Plant rid of waste which they previously stored in their body by shedding leaves, peeling of bark and felling of fruit.
- iii) It removes excess amount water by transpiration.

- iv) Plant get rid of waste by secreting them in the form of gum and resins.
- v) Plant also excrete some waste substance into the soil around them.

Excretion In Human

The excretory system of human beings consist of the following organs

Two kidney → Two ureters → Bladder → Urethra

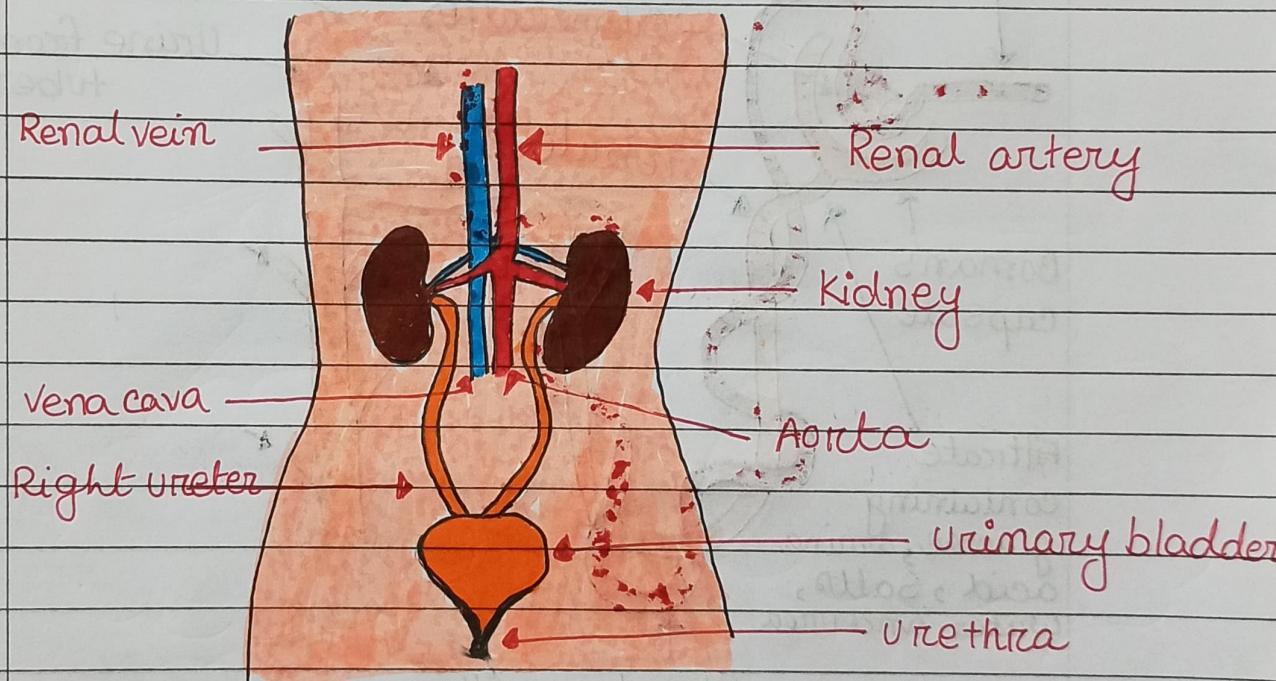


Figure : Excretory system in human being.

The main function of human excretory system is to removal of nitrogenous waste such (ureal) from body.

Kidney - It is a bean shaped organ which removes the poisonous substance like urea, other waste salts and excess water from the blood and excrete them in the form of a yellowish liquid called urine. The smaller units of kidney are called nephron which helps to filter toxic material from blood.

STRUCTURE OF Nephron

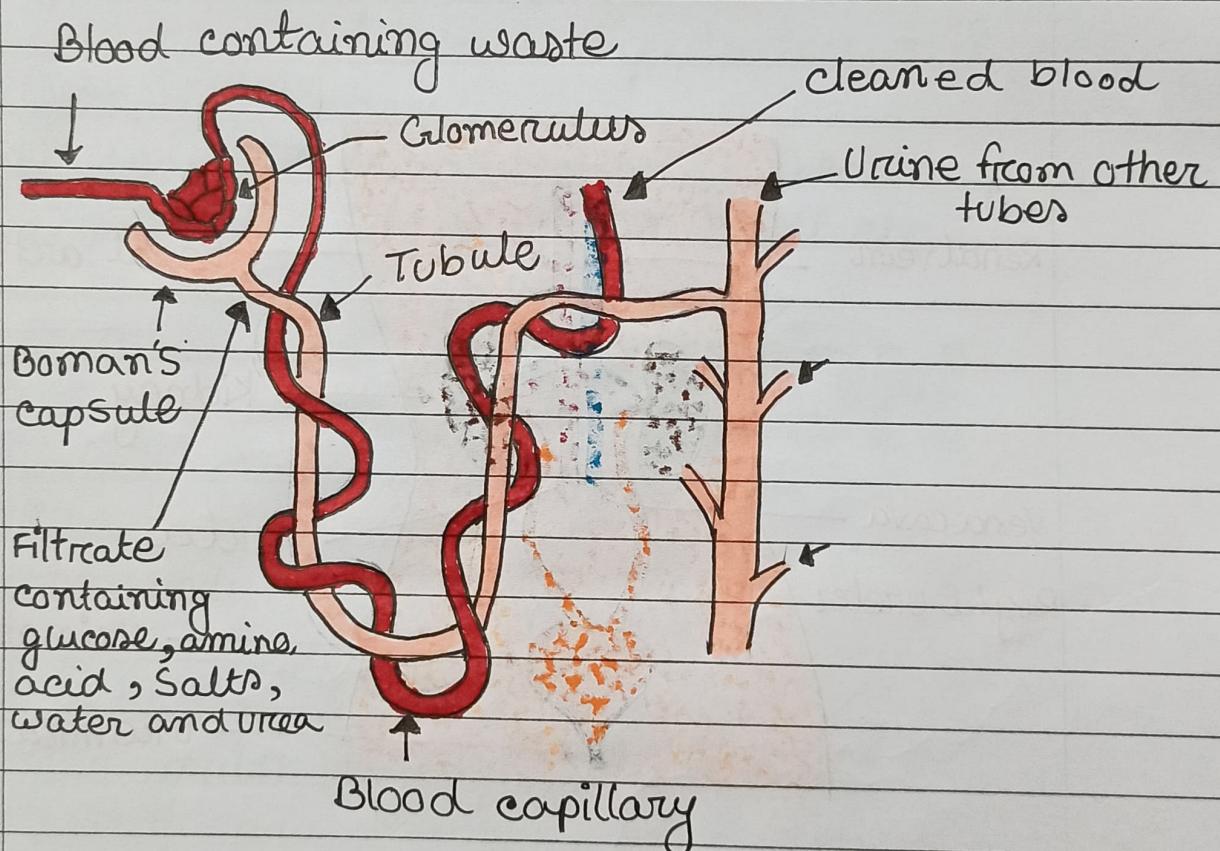


Figure : Diagram to show working of nephron.

Artificial kidney

Hemodialysis

An artificial kidney is a device to remove nitrogenous waste product to form urine from blood through dialysis. In this process the patient's blood passes through a dialysing solution, most of the waste like urea present in it passes through selectively permeable cellulose tubes into the dialysing solution. After that the clean blood is pumped back into the vein of the patient's arm.