

Various Life Process Essential to Sustain Life are

Nutrition

Excretion

Respiration

Transportation

Transportation of Plants

Excretory System

Removal of harmful waste from the body is called excretion. Excretory system of human beings includes

1. A pair of kidneys
2. A urinary bladder
3. A pair of the ureter
4. A urethra

Formation of urine in the urine

1. Glomerular filtration
2. Tubular reabsorption
3. Secretion

Ascent of Sap

The upward movement of water and minerals from roots to different plant parts is called ascent of sap. Factors involved are

1. Transpiration pull
2. Adhesion - Cohesion
3. Capillary Action
4. Root Pressure

Responsible for collecting metabolic waste and toxins from the cells and tissues to be purified or expelled from the body.

The Human Circulatory System Comprises 4 Main Organs

Heart

1. Muscular organ
2. Located in chest cavity between lungs
3. Enveloped by pericardium
4. Consists of 4 chambers
 - a. 2 atrium
 - b. 2 Ventricle

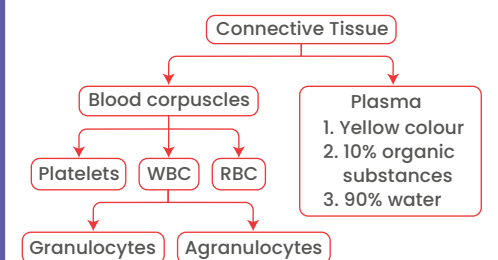
Lymphatic System

- Similar to blood, RBCs are absent.
1. Formed from the fluid which leaks from blood capillaries and goes to the intercellular space in the tissues. This fluid is collected through lymph vessels and finally return to the blood capillaries.
 2. Plays an important role in the immune system.
 3. Lymph a yellowish fluids escape from the blood capillaries into the intercellular spaces contain less proteins than blood.
 4. Lymph flows from the tissues to the heart assisting in transportation and destroying germs

Blood Vessels

1. Arteries
2. Veins
3. Capillaries

Blood



Respiratory system

The process of releasing energy from food. Breathing: Exchange of gases in our body is brought up by this process.

Flow Chart of Respiratory System

Nose → Nasal Cavity → Pharynx → Trachea → Bronchi → Alveolar ducts → Alveoli

Respiration in Humans

- Air is taken in through the nostrils - fine hairs filter the air.
- Air moves into the trachea - has ring of cartilage - ensures air passage does not collapse.
- From trachea air moves to the lungs - has bronchi leading to each lungs.
- Capillaries surrounding the alveoli take the O_2 to various parts of body through the blood and bring CO_2 back to the lungs.
- Gaseous exchange takes place in the alveoli due to high surface.
- Bronchi further divided into bronchioles - end of bronchioles - alveoli (air sacs).

Types of Respiration

1 Aerobic Respiration

This process, happens in the presence of oxygen. Pyruvic acid is converted into carbon dioxide. Energy is released and water molecule is also formed at the end of this process.

Consists of a network of arteries, veins, and capillaries, with the heart pumping blood through it

2 Anaerobic Respiration

- This type of respiration happens in the absence of oxygen. Pyruvic acid is either converted into ethyl alcohol or lactic acid.
- Ethyl alcohol is usually formed in case of anaerobic respiration in microbes, like yeast or bacteria. Lactic acid is formed in some microbes as well as in the muscle cells.
- Glucose (6 carbon molecule) → Pyruvate (3 carbon molecules) + Energy
- Pyruvate (In yeast, lack of O_2) → Ethyl alcohol + Carbon dioxide + Energy
- Pyruvate (In muscles, lack of O_2) → Lactic Acid + Energy
- Pyruvate (In mitochondria; the presence of O_2) → Carbon dioxide + Water + Energy

Flow Chart of Circulatory System

Superior Vena → Right Atrium → Tricuspid Valve → Right Ventricle → Pulmonary Valve → Pulmonary Artery → Lungs → Left Atrium → Right Ventricle → Aorta → Rest of the Body

Parts of Alimentary Canal: Digestive System

Mouth	<ul style="list-style-type: none"> • Teeth • Tongue • Saliva 	Mastication of food. Rolling, tasting & Swallowing of food. Produces salivary amylase (Converts starch into sugar)
Oesophagus/ Food pipe	Produces Peristaltic Movement	Passage of food from mouth to stomach
Stomach (by gastric glands produces)	<ul style="list-style-type: none"> • Gastric juice • HCl • Mucus 	Contains Pepsin (breakdown of protein) Makes medium acidic. Protects inner lining of stomach.
Small intestine	<ul style="list-style-type: none"> • Bile juice • Pancreatic juice <p>Intestinal Enzyme</p> <p>Carbohydrates → Glucose</p> <p>Fats → Fatty acid + Glycerol</p> <p>Protiens → Amino acids</p> <p>Small Intestine → Villi → Helps in absorption of food into the blood. (Finger like projections)</p> <p>Small Intestine → Receives secretion from → Liver → Bile → Juice</p> <p>Large fat Globules → Emulsify → Small fat Globules</p> <p>Pancreas → Pancreatic juice</p> <p>Trypsin → Protien → Peptones</p> <p>Lipase → Fats → Glycerol</p>	Contains <ul style="list-style-type: none"> • Amylase • Trypsin • Lipase
Large intestine		Absorption of water
Rectum		Temporary collection of waste
Anus		Helps in degestion

Steps of Holozoic nutrition:

- Egestion
- Ingestion
- Digestion
- Absorption
- Assimilation

Mode of Nutrition

Autotrophic

It is a process by which green plants synthesize their own food from simple substance.

Eg: CO_2 , H_2O , sunlight, chlorophyll

The process by which autotrophs take in CO_2 and H_2O and convert these into carbohydrates in the presence of chlorophyll, sunlight is called photosynthesis.

Equations:
 $6 CO_2 + 12 H_2O \longrightarrow C_6 H_{12} O_6 + 6 O_2 + 6 H_2O$

Heterotrophic

In this type of nutrition, organism derive their energy from the intake and digestion of the organic substances prepared by autotrophs.

1 Raw Materials for the Photosynthesis

1. Sunlight
2. Chlorophyll: Sunlight absorbed by chlorophyll.
3. CO_2 : Enters through stomata and oxygen is released as by product through stomata on leaf.
4. Water: Water + dissolved minerals like nitrogen, phosphorus etc, are taken up by the roots of soil.

2 Pigments

1. Chlorophyll a
2. Chlorophyll b
3. Xanthophylls
4. Carotenoids

3 Site of Photosynthesis

Chloroplast in the leaf, chloroplast contain chlorophyll.

1 Saprophytic

Organism derive their energy / nutrients from dead and decaying organic matter.

Eg: Fungi (yeast, mucor), Bacteria.

2 Parasitic

In this type of nutrition, organism derive their energy from other living organism.

3 Holozoic

Complex type of nutrition. Organism derive their nutrients ingestion of complex organic matter.

1. Herbivore
2. Carnivore
3. Omnivore