

CHAPTER 6: LIFE PROCESS

Nutrition	It is defined as the process by which the organism ingest, digests, transports and utilizes nutrients and disposes off their end products.	Mouth	The food is broken down into small pieces in the mouth. The saliva contains an enzyme called salivary amylase that breaks down starch which is a complex molecule to give sugar.
Autotrophic Nutrition	Autotrophic nutrition is a mode of nutrition in which the organism prepares or synthesizes its own food utilizing only the inorganic raw material. Eg green plants and autotrophic bacteria.	Oesophagus	The lining of canal has muscles that contract rhythmically in order to push the food forward. This is called peristaltic movement.
Heterotrophic Nutrition	Heterotrophic nutrition is a type of nutrition in which energy is derived from the intake and digestion of organic substances from plants and animals.	Stomach	Gastric gland release hydrochloric acid, a protein disgesting enzyme called pepsin, and mucus. Pepsin becomes active in the acidic medium. The mucus protects the inner lining of the stomach from the acid. The protein is digested in the stomach. The exit of food is regulated by sphincter muscles.
Saprophytic nutrition	It is mode of nutrition in which organisms obtain nutrients from the dead and decaying organic matter. Eg. Fungi and bacteria.	Small Intestine	The small intestine is the site of the complete digestion of carbohydrates, proteins and fats. It receives the secretions of the liver and pancreas for this purpose. Bile juice from liver breaks down fats. Pancreas secretes pancreatic juice which contains enzymes like trypsin for digesting proteins and lipase for breaking down emulsified fats. Proteins is converted to amino acids, complex carbohydrates into glucose and fats into fatty acids and glycerol. The digested food is taken up by the walls of the intestine with the help of villi which are finger like projections inside the small intestine.
Parasitic nutrition	It is mode of obtaining food synthesized by others. The organism which obtains the food is called 'parasite' and the organism from which food is absorbed is called 'host'. Eg. Cuscuta, plasmodium and round worm.	Large intestine	The unabsorbed food is sent into the large intestine where more villi absorb water from this material.
Holozoic nutrition	It is mode of nutrition in which the feeding of complex organic matter by ingestion, which is subsequently digested and absorbed takes place. Eg. Amoeba, frog, human beings.	Anus	The rest of the material is removed from the body via the anus. The exit of this waste material is regulated by the anal sphincter.
Enzymes	Enzymes are biomolecules that catalyze (i.e., increase the rates of) chemical reactions.		
Photosynthesis	It is the process by which green plants synthesise organic food in the form of carbohydrates from Carbon Dioxide and water in the presence of sunlight.		
Phagocytosis	The process of obtaining food by Amoeba is called phagocytosis.		
Nutrition in Amoeba:	The various steps in nutrition are ingestion, digestion, assimilation and egestion.		
Ingestion	Amoeba engulfs the food by forming pseudopodia. When the food is completely encircled and the tips of encircling pseudopodia touch each other, the membrane at that point dissolves and the food is encaptured alongwith a few lysosomes into the food vacuole.		
Digestion	Inside the food vacuole, food gets digested by digestive enzymes.		
Assimilation	The digested food diffuses into the cytoplasm and is utilized by the cell.		
Egestion	The undigested food remains in the food vacuole, and is thrown out of the body.		
Human Digestive System	The alimentary canal is nearly nine meter long tube. It starts after the buccal cavity and ends at anus. Oesophagus, stomach, duodenum, ileum (small intestine), colon and rectum (large intestine) are sequential parts of the alimentary canal.		

Respiration:	Respiration is a complex process which includes (i) breathing and (ii) oxidation of digested food occurring in the cells in order to release energy.
Breathing:	The mechanism by which organisms obtain oxygen from the environment and carbon dioxide, is termed breathing.
Aerobic respiration	Oxygen regulated respiration is called aerobic respiration. During this, food (glucose) is completely broken down into carbon dioxide and water by the process of oxidation. This results in the production of ATP, which is the source of energy.
Anaerobic respiration	The release of energy from food in the absence of oxygen is done by a process called anaerobic respiration. Aerobic respiration also takes place in our muscles during vigorous muscular activity, when oxygen gets used up faster than it is available to muscle cells. During this process, ethanol is formed and end product in some plants and lactic acid in muscles of animals
Mechanism of Breathing	When we breathe in, air from outside rushes into the alveoli of the lungs. This is called inhalation and occurs when the thoracic cavity expands. Thoracic cavity expands when the diaphragm and muscles attached to ribs contract. This makes the thorax move upwards and outwards, thereby increasing the volume inside thoracic cavity. Thus, air pressure decreases inside and air from outside rushes into lungs through nostrils, trachea and bronchi. The alveolar sacs get filled with oxygen rich air. The alveoli are richly supplied with blood capillaries. Through the thin walls of alveoli and blood capillaries, exchange of gases takes place. From the alveoli, oxygen diffuses into blood and is supplied to the tissues. Carbon dioxide is absorbed by blood from the tissues and is carried to the alveoli of lungs for exhalation. Carbon dioxide is subsequently pushed out of lungs through trachea and nostrils. This happens when thoracic cavity comes back to its original size as diaphragm and rib muscles relax. Breathing out carbon dioxide is called exhalation. Thus, breathing has two events: inhalation and exhalation.
Heart is an the hollow muscular organ that receives blood from the veins and propels it into and through the arteries.	
<ol style="list-style-type: none"> 1. Oxygen-rich blood from the lungs comes to the thin-walled upper chamber of the heart on the left, the left atrium. 2. The left atrium relaxes when it is collecting this blood. It then contracts, while the next chamber, the left ventricle, expands, so that the blood is transferred to it. 3. The left atrium relaxes when it is collecting this blood. It then contracts, while the next chamber, the left ventricle, expands, so that the blood is transferred to it. When the muscular left ventricle contracts in its turn, the blood is pumped out to the body. 4. De-oxygenated blood comes from the body to the upper chamber on the right, the right atrium, as it expands. 5. As the right atrium contracts, the corresponding lower chamber, the right ventricle, dilates. 6. This transfers blood to the right ventricle, which in turn pumps it to the lungs for oxygenation. 	

Emphysema	The areas for gaseous exchange in lungs gets reduced in smokers. Walls separating alveoli breakdown, leading to abnormal alveoli with lesser area. Gaseous exchange is thus reduced. As a result, heart has to pump more blood and an over-strained heart may lead to heart failure.
Artery	Arteries are the vessels which carry blood away from the heart to various organs of the body. Since the blood emerges from the heart under high pressure, the arteries have thick, elastic walls.
Veins	Veins collect the blood from different organs and bring it back to the heart. They do not need thick walls because the blood is no longer under pressure, instead they have valves that ensure that the blood flows only in one direction.
Lymphatic System	<ol style="list-style-type: none"> 1. Through the pores present in the walls of capillaries some amount of plasma, proteins and blood cells escape into intercellular spaces in the tissues to form the tissue fluid or lymph. 2. Lymph carries digested and absorbed fat from intestine and drains excess fluid from extra cellular space back into the blood.
Xylem	In xylem tissue, vessels and tracheids of the roots, stems and leaves are interconnected to form a continuous system of water-conducting channels reaching all parts of the plant. At the roots, cells in contact with the soil actively take up ions. This creates a difference in the concentration of these ions between the root and the soil. Water, therefore, moves into the root from the soil to eliminate this difference.
Transpiration	The loss of water in the form of vapour from the aerial parts of the plant is known as transpiration.
Advantages of Transpiration	<ol style="list-style-type: none"> (1) Transpiration helps in the absorption and upward movement of water and minerals dissolved in it from roots to the leaves. (2) It also helps in temperature regulation.
Translocation	Transport of soluble products of photosynthesis is called translocation.
Excretion	Metabolic activities generate nitrogenous materials which need to be removed. The biological process involved in the removal of these harmful metabolic wastes from the body is called excretion.
Excretory System	The excretory system of human beings includes a pair of kidneys, a pair of ureters, a urinary bladder and a urethra.
Excretion in humans	<ol style="list-style-type: none"> 1. The purpose of making urine is to filter out waste products from the blood. 2. Nitrogenous waste such as urea or uric acid are removed from blood in the kidneys. 3. Each kidney has large numbers of these filtration units called nephrons packed close together. Some substances in the initial filtrate, such as glucose, amino acids, salts and a major amount of water, are selectively re-absorbed as the urine flows along the tube. The amount of water reabsorbed depends on how much excess water there is in the body, and on how much of dissolved waste there is to be excreted.
Excretion in Plants	<ol style="list-style-type: none"> 1. Plant can get rid of excess water by transpiration. 2. Waste products may be stored in leaves that fall off. 3. Other waste products are stored as resins and gums, especially in old xylem. 4. Plants also excrete some waste substances into the soil around them.