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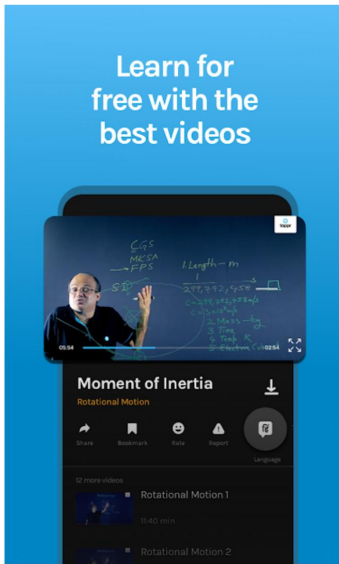
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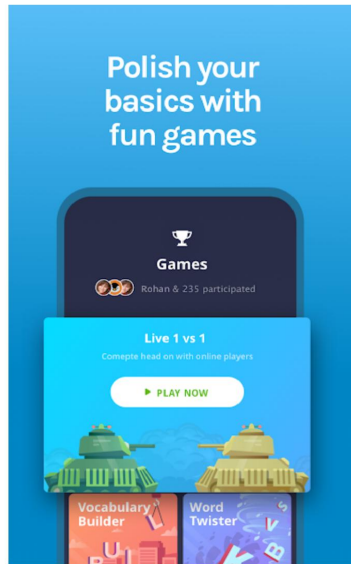


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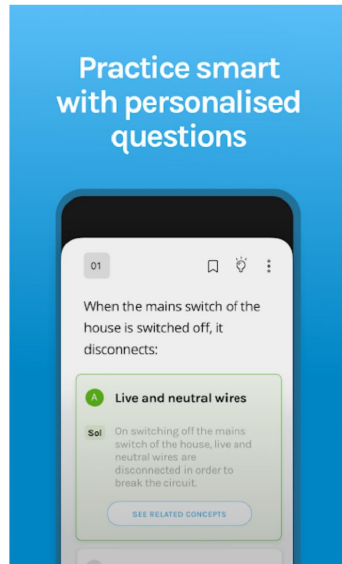
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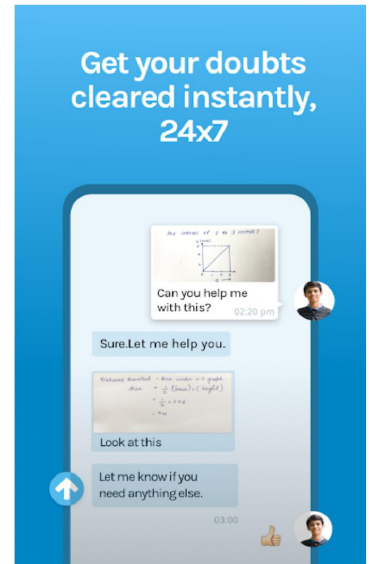
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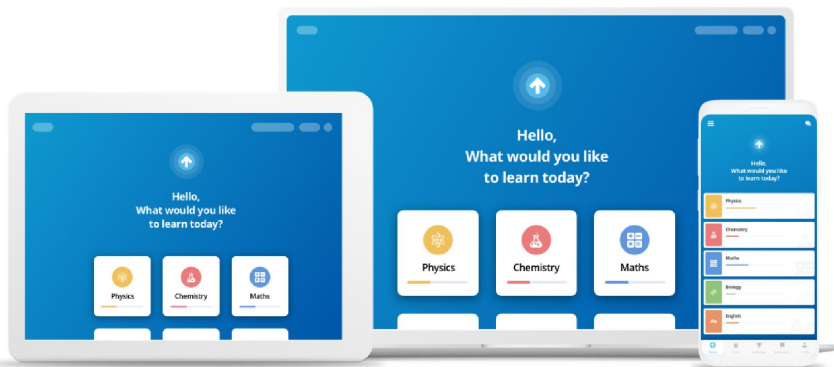
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**#424317**

**Topic:** Introduction to photosynthesis

Plants are autotrophic. Can you think of some plants that are partially heterotrophic?

**Solution**

Plants are the autotrophs as they have the ability to synthesize their own food by the process of photosynthesis due to the presence of green pigments. During this process, they utilize carbon dioxide and water in the presence of sunlight. However, some plants are partially heterotrophic and are called as insectivores. They have various means of capturing insects so as to supplement their diet with nitrogen derived from insects, as they live in nitrogen deficient soil. The examples include pitcher plant (*Nepenthes*), Venus fly trap, bladderwort and sundew plant (*Drosera*).

**#424907**

**Topic:** Absorption of water and ascent of sap

How are the minerals absorbed by the plants?

**Solution**

The absorption of soil nutrients by the roots of plants occurs in two main phases – apoplast and symplast. During the initial phase or apoplast, there is a rapid uptake of nutrients from the soil into the free spaces of plant cells. This process is passive and it usually occurs through trans-membrane proteins and ion channels. In the second phase or symplast, the ions are taken slowly into the inner spaces of the cells. This pathway generally involves the expenditure of energy in the form of ATP.

**#424933**

**Topic:** Introduction and types of respiration

Distinguish between the following.

- (a) Aerobic respiration and Anaerobic respiration
- (b) Glycolysis and Fermentation
- (c) Glycolysis and Citric acid cycle

**Solution**

(a)

Aerobic Respiration	Anaerobic Respiration
1. Aerobic respiration takes place in the presence of free oxygen.	1. Anaerobic respiration takes place in the absence of free oxygen.
2. The first step of this process (glycolysis) takes place in the cytoplasm while the second step (Krebs cycle) is carried out in mitochondria.	2. The complete process is carried out outside the mitochondria i.e., in the cytoplasm.
3. Glucose is completely oxidized into carbon dioxide and water.	3. Glucose is incompletely oxidized into carbon dioxide and ethyl alcohol.
4. 38 molecules of ATP are produced by the complete oxidation of one gram-mole of glucose.	4. Only 2 molecules of ATP are formed in this process.

(b)

Glycolysis	Fermentation
1. Glycolysis is a common process during aerobic and anaerobic respiration.	1. Fermentation is a type of anaerobic respiration.
2. Pyruvic acid is produced as its end product.	2. Ethanol or lactic acid is produced as its end product.

(c)

Glycolysis	Citric acid cycle (Krebs cycle)
1. It is a linear pathway.	1. It is a cyclic pathway.
2. It occurs in the cell cytoplasm.	2. It occurs in the mitochondrial matrix.
3. It occurs in both aerobic as well as in anaerobic respiration.	3. It occurs in aerobic respiration only.
4. One glucose molecule breaks down to generate 2 NADH <sub>2</sub> and 2 ATP molecules.	4. It produces 6 NADH <sub>2</sub> , 2 FADH <sub>2</sub> , and 2 ATP molecules on the breakdown of two acetyl-CoA molecules generated after glycolysis.

**#424962**

**Topic:** Physiology of digestion



#424986

Topic: Physiology of digestion

How does bile help in the digestion of fats?

**Solution**

Bile is a digestive juice which helps in the digestion of fats. It is secreted by the liver. It has bile salts such as bilirubin and biliverdin. These break down large fat globules into smaller globules so that the pancreatic enzymes can easily act on them. This process is known as emulsification of fats. It also makes the medium alkaline and activates lipase.

#424989

Topic: Physiology of digestion

Describe the process of digestion of protein in stomach.

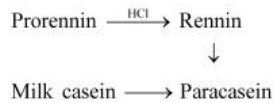
**Solution**

The digestion of proteins begins in the stomach and is completed in the small intestine. The digestive juice secreted by the gastric glands present on the stomach walls is called as gastric juice. The food that enters the stomach becomes acidic on mixing with this gastric juice.

The main components of gastric juice are hydrochloric acid, pepsinogen, mucus, and rennin. Hydrochloric acid dissolves the bits of food and creates an acidic medium so that pepsinogen is converted into pepsin. Pepsin is a protein-digesting enzyme. It is secreted in its inactive form called pepsinogen, which then gets activated by hydrochloric acid.

The activated pepsin then converts proteins into proteases and peptides.

Rennin is a proteolytic enzyme, released in an inactive form called as pro-rennin. Rennin plays an important role in the coagulation of milk.



#424991

Topic: Lymphatic system

What is the difference between lymph and blood?

**Solution**

Blood	Lymph
1. Blood is red in colour due to presence of RBCs.	1. Lymphs are colourless due to absence of RBCs.
2. Blood plasma contains RBCs, WBCs and platelets.	2. The lymph plasma contains WBCs.
3. It contains diffusible and non-diffusible proteins like albumin, globulin and fibrinogen.	3. It contains diffusible proteins.
4. It can clot due to presence of more amount of fibrinogen.	4. It clots slowly due to presence of less fibrinogen.
5. It carries more O <sub>2</sub> and more digested food.	5. It carries less O <sub>2</sub> and less digested products.

#424994

Topic: Circulatory pathways

What is meant by double circulation? What is its significance?

**Solution**

Double circulation is a process during which blood passes twice through the heart during one complete cycle. This type of circulation is found in amphibians, reptiles, birds, and mammals. However, it is more prominent in birds and mammals as in them the heart is completely divided into four chambers – the right atrium, the right ventricle, the left atrium, and the left ventricle.

The movement of blood in an organism is divided into two parts:

- (i) Systemic circulation
- (ii) Pulmonary circulation

Systemic circulation involves the movement of oxygenated blood from the left ventricle of the heart to the aorta. It is then carried by blood through a network of arteries, arterioles, and capillaries to the tissues. From the tissues, the deoxygenated blood is collected by the venules, veins, and vena cava, and is emptied into the left auricle.

Pulmonary circulation involves the movement of deoxygenated blood from the right ventricle to the pulmonary artery, which then carries blood to the lungs for oxygenation. From the lungs, the oxygenated blood is carried by the pulmonary veins into the left atrium.

Hence, in double circulation, blood has to pass alternately through the lungs and the tissues.

Significance of double circulation:

The separation of oxygenated and deoxygenated blood allows a more efficient supply of oxygen to the body cells. Blood is circulated to the body tissues through systemic circulation and to the lungs through the pulmonary circulation.

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**#424995**

**Topic:** Physiology of digestion

Bile juice contains no digestive enzymes, yet it is important for digestion. Why?

**Solution**

Bile is a digestive juice secreted by the liver. Although it does not contain any digestive enzymes, it plays an important role in the digestion of fats. Bile juice has bile salts such as bilirubin and biliverdin. These break down large fat globules into smaller globules so that the pancreatic enzymes can easily act on them. This process is known as emulsification of fats. Bile juice also makes the medium alkaline and activates lipase.

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**#424997**

**Topic:** Lymphatic system

Write the differences between.

- (a) Blood and Lymph
- (b) Open and closed system of circulation
- (c) Systole and diastole
- (d) P- wave and T- wave

**Solution**

## (a) Blood and Lymph

Lymph	Blood
It is a colourless fluid.	It is red-coloured fluid.
It contains plasma and lesser number of WBCs and platelets.	It contains plasma, RBCs, WBCs, and platelets.
It transports nutrients from the tissue cells to the blood, through lymphatic vessels.	It transports nutrients and oxygen from one organ to another.
It helps in body defence and is a part of the immune system.	It helps in the circulation of oxygen and carbon dioxide.

## (b) Open and Closed system of circulation

Open system of circulation	Closed system of circulation
In this system, blood is pumped by the heart, through large vessels, into body cavities called sinuses.	In this system, blood is pumped by the heart, through a closed network of vessels.
The body tissues are in direct contact with blood.	The body tissues are in indirect contact with blood.
Blood flows at low pressure.	Blood flows at high pressure.
Blood flow cannot be regulated.	Blood flow can be regulated
This is present in arthropods and molluscs.	This is present in annelids, echinoderms, and vertebrates.

## (c) Systole and Diastole

Systole	Diastole
It is the contraction of the heart chambers to drive blood into the aorta and the pulmonary artery.	It is the relaxation of the heart chambers between two contractions.
Systole decreases the volume of the heart chambers and forces the blood out of them.	Diastole brings the heart chambers back into their original sizes to receive more blood

## (d) P-wave and T-wave

P-wave	T-wave
In an electrocardiogram (ECG), the P-wave indicates the activation of the Sino-atrial node.	In an electrocardiogram (ECG), the T-wave represents ventricular relaxation.
During this phase, the impulse of contraction is generated by the SA node, causing atrial depolarisation.	During this phase, the ventricles relax and return to their normal state.
It is of atrial origin.	It is of ventricular origin.

#424998

Topic: Physiology of digestion

Describe the digestive role of chymotrypsin. Which two other digestive enzymes of the same category are secreted by its source gland?

**Solution**

The enzyme trypsin (present in the pancreatic juice) activates the inactive enzyme chymotrypsinogen into chymotrypsin.

Chymotrypsinogen

→  
Trypsin

Chymotrypsin

(Inactive)

(Active)

The activated chymotrypsin plays an important role in the further breakdown of the partially-hydrolysed proteins.

Proteins

→  
Chymotrypsin

Peptides

The other digestive enzymes of the same category are trypsinogen and carboxypeptidase. These are secreted by the same source-gland, pancreas.

Trypsinogen is present in an inactive form in the pancreatic juice. The enzyme enterokinase – secreted by the intestinal mucosa – activates trypsinogen into trypsin.

Trypsinogen

→  
Enterokinase

Trypsin + Inactive peptide

The activated trypsin then further hydrolyses the remaining trypsinogen and activates other pancreatic enzymes such as chymotrypsinogen and carboxypeptidase. Trypsin also helps in breaking down proteins into peptides.

Proteins

→  
Trypsin

Peptides

Carboxypeptidases act on the carboxyl end of the peptide chain and help in releasing the last amino acids.

Peptides

→  
Carboxypeptidase

Small peptide chain + Amino acids

**#424999**

**Topic:** Circulatory pathways

Give the difference between open and closed system of circulation.

**Solution**

	Open system of circulation	Closed system of circulation
1	It is present in lower organisms, eg., cockroach.	It is present in higher organisms, eg., human.
2	In this system blood flows through open spaces thus, blood is in direct contact with tissue fluids.	In this system blood flows through closed system of blood vessels thus, blood is in indirect contact with tissue fluids.
3	In this system, blood pressure is low hence, this system is less active than closed system of circulation.	In this system, blood pressure is high hence, this system is more active than open system.

**#425000**

**Topic:** Physiology of digestion

How are polysaccharides and disaccharides digested?

**Solution**



The digestion of carbohydrates takes place in the mouth and the small intestine region of the alimentary canal. The enzymes that act on carbohydrates are collectively known as carbohydrases.

Digestion in the mouth:

As food enters the mouth, it gets mixed with saliva. Saliva secreted by the salivary glands contains a digestive enzyme called salivary amylase. This enzyme breaks down starch into sugar at pH 6.8.

Salivary amylase continues to act in the oesophagus, but its action stops in the stomach as the contents become acidic. Hence, carbohydrate-digestion stops in the stomach.

Digestion in the small intestine:

Carbohydrate-digestion is resumed in the small intestine. Here, the food gets mixed with the pancreatic juice and the intestinal juice. Pancreatic juice contains the pancreatic amylase that hydrolyses the polysaccharides into disaccharides.

Similarly, the intestinal juice contains a variety of enzymes (disaccharidases such as maltase, lactase, sucrase, etc.). These disaccharidases help in the digestion of disaccharides.

The digestion of carbohydrates is completed in the small intestine.

#### #425001

**Topic:** ECG and blood pressure

Write differences between systole and diastole.

#### Solution

	Systole	Diastole
1	It is the contraction of the heart chambers to drive blood into the aorta and the pulmonary artery. The aortic valve and the pulmonary valve remain closed during the systole while the semilunar valves remain open.	It is the relaxation of the heart chambers between two contractions. During diastole, the chambers are filled with blood. The filling of the atrial chamber is known as atrial diastole and filling of the ventricles is known as ventricular diastole.
2	Systole decreases the volume of the heart chambers and forces the blood out of them.	Diastole brings the heart chambers back into their original sizes to receive more blood.

#### #425002

**Topic:** Physiology of digestion

What would happen if HCl was not secreted in the stomach?

#### Solution

Hydrochloric acid is secreted by the glands present on the stomach walls. It dissolves bits of food and creates an acidic medium. The acidic medium allows pepsinogen to be converted into pepsin. Pepsin plays an important role in the digestion of proteins. Therefore, if HCl were not secreted in the stomach, then pepsin would not be activated. This would affect protein digestion. A pH of about 1.8 is necessary for proteins to be digested. This pH is achieved by HCl.

#### #425004

**Topic:** Physiology of digestion

How does butter in your food get digested and absorbed in the body?

#### Solution

Butter contains a high percentage of fat in the small intestine. The bile juice secreted by the liver converts the large fat globules into smaller globules, so as to increase their surface area for the action of lipase. This process is referred to as emulsification of fats. The pancreatic lipase present in the pancreatic juice and the intestinal lipase present in the intestinal juice hydrolyses the fat molecules into triglycerides, diglycerides, monoglycerides, and ultimately into glycerol.

Fats----->Triglycerides + Diglycerides

Diglycerides and monoglycerides-----> Fatty acids + Glycerol

Absorption of fats:

Fat absorption is an active process. During fat digestion, fats are hydrolyzed into fatty acids and glycerol. However, since these are water insoluble, they cannot be directly absorbed by the blood. Hence, they are first incorporated into small droplets called micelles and then transported into the villi of the intestinal mucosa.

They are then reformed into small microscopic particles called chylomicrons, which are small, protein-coated fat globules. These chylomicrons are transported to the lymph vessels in the villi. From the lymph vessels, the absorbed food is finally released into the blood stream and from the blood stream, to each and every cell of the body.

#### #425006

**Topic:** Physiology of digestion

Discuss the main steps in the digestion of proteins as the food passes through different parts of the alimentary canal.

**Solution**

The digestion of proteins begins in the stomach and is completed in the small intestine. The enzymes that act on proteins are known as proteases.

Digestion in the stomach:

The digestive juice secreted in the gastric glands present on the stomach walls is called gastric juice. The main components of gastric juice are HCl, pepsinogen, and rennin.

The food that enters the stomach becomes acidic on mixing with this gastric juice.

The acidic medium converts inactive pepsinogen into active pepsin. The active pepsin then converts proteins into proteases and peptides.

Proteins



Proteases + Peptides

The enzyme rennin plays an important role in the coagulation of milk.

Digestion in the small intestine:

The food from the stomach is acted upon by three enzymes present in the small intestine – pancreatic juice, intestinal juice (known as succus entericus), and bile juice.

*Action of pancreatic juice*

Pancreatic juice contains a variety of inactive enzymes such as trypsinogen, chymotrypsinogen, and carboxypeptidases. The enzymes are present in an inactivated state. The enzyme enterokinase secreted by the intestinal mucosa activates trypsinogen into trypsin.

Trypsinogen



Trypsin + Inactive peptide

The activated trypsin then activates the other enzymes of pancreatic juice.

Chymotrypsinogen is a proteolytic enzyme that breaks down proteins into peptides.

Chymotrypsinogen



Chymotrypsin

Proteins



Peptides

Carboxypeptidases act on the carboxyl end of the peptide chain and help in releasing the last amino acids.

Peptides



Smaller peptide chain + Amino acids

*Action of bile juice*

Bile juice has bile salts such as bilirubin and biliverdin which break down large, fat globules into smaller globules so that pancreatic enzymes can easily act on them. This process is known as emulsification of fats. Bile juice also makes the medium alkaline and activates lipase. Lipase then breaks down fats into diglycerides and monoglycerides.

*Action of intestinal juice*

Intestinal juice contains a variety of enzymes. Pancreatic amylase digests polysaccharides into disaccharides. Disaccharidases such as maltase, lactase, sucrase, etc., further digest the disaccharides.

The proteases hydrolyse peptides into dipeptides and finally into amino acids.



Amino acids

Pancreatic lipase breaks down fats into diglycerides and monoglycerides.

The nucleases break down nucleic acids into nucleotides and nucleosides.

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**#425007**

**Topic:** Structure and function of heart

Why do we call our heart myogenic?

**Solution**

In the human heart, contraction is initiated by a specially modified heart muscle known as the sinoatrial node. It is located in the right atrium. The SA node has the inherent power of generating a wave of contraction and controlling the heart beat. Hence, it is known as the pacemaker. Since the heartbeat is initiated by the SA node and the impulse of contraction originates in the heart itself, the human heart is termed as myogenic. The hearts of vertebrates and molluscs are also myogenic.

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**#425064**

**Topic:** Disorders of excretory system

Dialysis fluid contain all the constituents as in plasma except

**Solution**

Dialysis fluid contains all the constituents as in plasma, except the nitrogenous wastes. The dialysis fluid contains water, glucose, salts and various substances at the correct concentration for the body. The dialysing membrane allows small particles such as water and mineral ions to pass through it. Due to the absence of nitrogenous waste in the dialysing fluid, they easily pass through the membrane from the blood to the dialysis fluid due to the concentration gradient.

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**#464798**

**Topic:** Excretory system

The kidneys in human beings are a part of the system for

- A Nutrition
- B Respiration
- C Excretion
- D Transportation

**Solution**

Kidneys are the bean shaped reddish brown paired organs that serve in maintaining the fluid electrolyte balance and acid base balance of body through the process of urine formation. Excretion refers to removal of metabolic waste from body. This makes kidneys part of excretory system. Nutrition refers to obtaining the food to meet the energy requirement for growth and development. Respiration refers to the process that allows entry of oxygen from air to blood and exit of carbon dioxide from blood to air. Transportation refers to movement of materials, mainly nutrients and gases, from one organ to other.

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**#464799**

**Topic:** Absorption of water and ascent of sap

The xylem in plants are responsible for

- A Transport of water
- B Transport of food
- C Transport of amino acids
- D Transport of oxygen

**Solution**

Xylem tissues include tracheids, vessels, fibres and parenchyma and serve in the ascent of sap/water and minerals. Phloem tissues is a composed of four elements namely, sieve elements, companion cell, phloem fibres and phloem parenchyma and serve in translocation of organic nutrients. Transfer RNA (tRNA) serve as carrier RNA and transports amino acids from cell pool to the mRNA bound to the ribosome where the protein is being synthesized. Haemoglobin molecule contains four polypeptide chains and four heme prosthetic groups. It serves as a carrier of oxygen gas.

So, the correct answer is option A.

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**#464800**

**Topic:** Introduction to photosynthesis

The autotrophic mode of nutrition requires

- A Carbon dioxide and Water
- B Chlorophyll
- C Sunlight
- D All of the above

**Solution**

The autotrophic organisms are self-feeders that can synthesize their own food (organic compounds) using carbon dioxide as a source of carbon and water as an electron donor. They use sunlight as a source of energy, trapped by chlorophyll and produces oxygen as a by-product. Thus, the correct answer is option D.

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**#464801**

**Topic:** Introduction and types of respiration

The breakdown of pyruvate to give carbon dioxide, water and energy takes place in

- A Cytoplasm
- B Mitochondria
- C Chloroplast
- D Nucleus

**Solution**

Pyruvate is the end product of glycolysis which is a series of reactions which break down glucose into two molecules of pyruvic acid in the cytoplasm. It is followed by oxidation of pyruvate into carbon dioxide, water, energy and reducing power NADH, the process is termed as Krebs cycle. NADH is reoxidized to NAD by passing its electrons to oxygen through the process of mitochondrial cellular respiration to generate ATP (the energy currency). The enzymes for Krebs cycle are present in mitochondria.

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**#464802**

**Topic:** Alimentary canal

How are fats digested in our bodies? Where does this process take place?

**Solution**

Fat digestion takes place in the small intestine. The alkaline secretion of liver, bile, is carried to the small intestine by bile duct. The process starts with emulsification (break down) of large fat globule by the salt of bile into smaller micelles to facilitate further enzymatic reaction and digestion process. The fat-digesting lipase enzyme in pancreatic juice and intestinal juices digest the fat in micelles into triacylglycerols and then fatty acids and glycerols. These fat digestion products are then absorbed by intestinal mucosa and are carried to tissues by the lymphatic system and blood where they either serve as energy fuel or are stored after re-esterification.

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**#464803**

**Topic:** Physiology of digestion

What is the role of saliva in the digestion of food?

**Solution**

Salivary glands are present in the oral cavity that secrete saliva which is released into the mouth. Saliva contains bicarbonate and salivary amylase and serves to initiate the process of starch digestion into simple sugars by breaking the  $\alpha$ -1, 4- glycosidic linkage of starch to release oligosaccharides.

#464804

**Topic:** Introduction to photosynthesis

What are the necessary conditions for autotrophic nutrition and what are its by-products?

**Solution**

The autotrophic organisms are self-feeders that can synthesize the organic compounds using carbon dioxide as a source of carbon and water as an electron donor. Green plants are photoautotrophs that carry out photosynthesis, a process that requires atmospheric carbon dioxide, water, sunlight and chlorophyll. The energy of sunlight is trapped by chlorophyll and is used to fix carbon dioxide into organic compounds (glucose) in presence of water. These organic compounds are used by plants for their own growth and maintenance and stored in form of starch that serves as a source of energy when required. Since water molecules serve as an electron donor, oxygen is produced during the process of photosynthesis as a by-product and is released into the air.

#464805

**Topic:** Aerobic respiration (Kreb's cycle and ETS)

What are the differences between aerobic and anaerobic respiration? Name some organisms that use the anaerobic mode of respiration.

**Solution**

The difference between aerobic and anaerobic respiration.

Aerobic respiration	Anaerobic respiration
1. Aerobic respiration refers to complete breakdown of metabolic fuels in presence of oxygen.	1. Anaerobic respiration is the process of partial breakdown of fuel (glucose) in absence of oxygen.
2. It includes glycolysis, citric acid cycle and oxidative phosphorylation. The first two processes take place in the cytoplasm while last one occurs in mitochondria.	2. Glycolysis is followed by ethanol fermentation (occurs in yeast) or lactic acid fermentation (in muscles and microbes like lactic acid bacteria).
3. The end products are carbon dioxide and water.	3. End products of ethanol fermentation are ethanol and carbon dioxide; that of lactic acid fermentation are lactic acid
4. Owing to complete oxidation of glucose, a large amount of energy is produced (36-38 ATP molecules)	4. Incomplete oxidation of glucose does not release all stored energy and only 2 ATP molecules are produced.

Anaerobic respiration is carried out by yeast and other anaerobic organisms like lactic acid bacteria, *E. coli*, *Staphylococcus*, *Clostridium* etc.

#464806

**Topic:** Respiratory organs

How are the alveoli designed to maximise the exchange of gases?

**Solution**

Alveoli are pouch like air sac that is made up of simple squamous epithelium. It has thin cell wall to facilitate gaseous exchange. Presence of millions of alveoli in lungs provides ample surface area to facilitate gaseous exchange between air in alveoli and blood in surrounding capillaries. Oxygen diffuses across the alveolar and capillary wall into the bloodstream while carbon dioxide diffuses from blood across the mentioned walls into the alveoli.

#464807

**Topic:** Circulatory pathways

What would be the consequences of a deficiency of haemoglobin in our bodies?

**Solution**

Haemoglobin molecule contains four polypeptide chains and four heme prosthetic groups. It serves as carrier of oxygen gas. Haemoglobin deficiency would decrease the oxygen carrying capacity of blood which in turn would cause breathing problems and lack of energy and weight loss.

#464808

**Topic:** Circulatory pathways

Describe double circulation in human beings. Why is it necessary?

**Solution**

Mammals have a double circulatory system. This means that during a single cycle, the blood goes twice in the heart. There are two loops in which blood is circulated. One loop is oxygenated and the other is de-oxygenated. This double circulatory system is important because it ensures provision of oxygenated blood to the muscle and not a mixture of oxygenated and de-oxygenated blood. Hence, this system ensures efficient supply of oxygenated blood to the muscles.

#464809

**Topic:** Translocation of organic solutes

What are the differences between the transport of materials in xylem and phloem?

**Solution**

Difference between xylem and phloem transport:

Xylem transport	Phloem transport
1. Xylem tissues include tracheids, vessels, fibres and parenchyma and serve in ascent of sap/water and minerals.	1. Phloem tissues is a composed of four elements namely, sieve tube elements, companion cell, phloem fibres and phloem parenchyma and serve in translocation of organic nutrients.
2. Due to defined source and sink relationship, the movement is unidirectional.	2. The movement is multidirectional as source sink relationship keeps changing.
3. Xylem transport is not influenced by metabolic inhibitors.	3. Phloem transport is inhibited by metabolic inhibitors.
4. Xylem vessels and tracheids are main component of transport.	4. Sieve tube are main component of transport which are assisted by companion cells.
5. Major driving forces are transpiration pull and diffusion.	5. Being active transport, it uses ATP.

#464810

**Topic:** Excretory system

Compare the functioning of alveoli in the lungs and nephrons in the kidneys with respect to their structure and functioning.

**Solution**

Alveoli and nephrons.

No.	Alveoli	Nephrons
1.	Alveoli are pouch-like air sacs that are made up of simple squamous epithelium.	1. Nephrons are the elongated tubules that form an anatomical and functional unit of the kidney.
2.	It has a thin cell wall to facilitate gaseous exchange.	2. Each nephron has Bowman's capsule, proximal convoluted tubule, a loop of the nephron, distal convoluted tubule and the collecting ducts.
3.	It is surrounded by blood capillaries.	3. Blood capillaries are present as glomerulus and peritubular capillaries.
4.	Presence of millions of alveoli in lungs provide ample surface area to facilitate gaseous exchange between air in alveoli and blood in capillaries. Oxygen diffuses across the alveolar and capillary wall into the bloodstream while carbon dioxide diffuses from blood across the mentioned walls into the alveoli.	4. It serves in fluid and electrolyte balance of the body through the process of urine formation. Each part performs different role in urine formation.

#634575

**Topic:** Introduction to respiration

What is the function of gill?

**Solution**

Gills are the organs for respiration in fishes. Gills are capable of absorbing oxygen from the water flowing over their surface.