



पु.ना International School
Shree Swaminarayan Gurukul, Zundal

SCIENCE -X

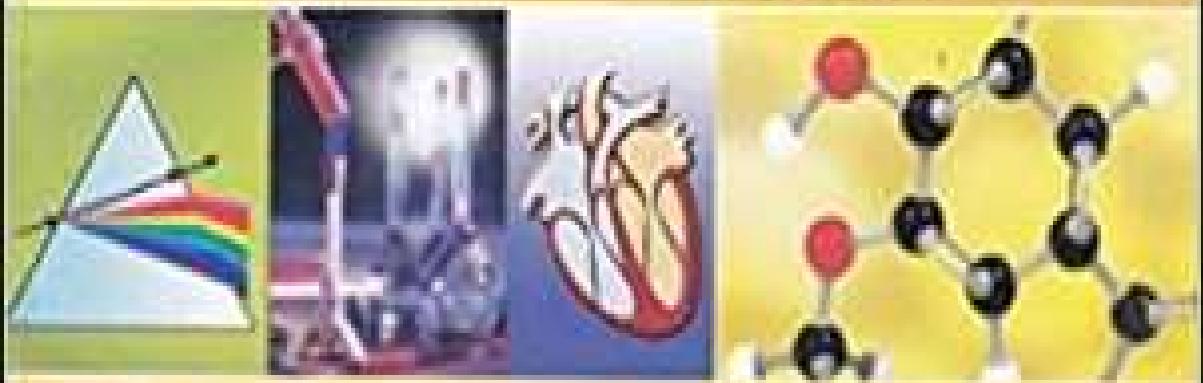
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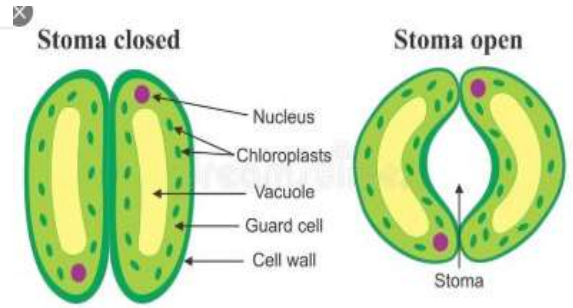
SCIENCE

SCIENCE



Textbook for Class X

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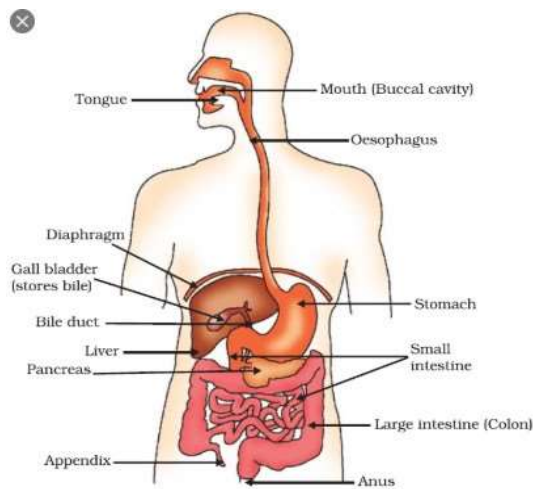
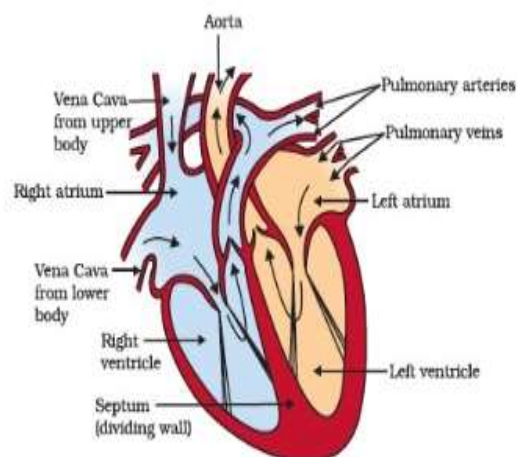


Figure 6.6 Human alimentary canal



Chapter - 6

Life Processes

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1. Why is diffusion insufficient to meet the oxygen requirements of multicellular organisms like humans?

Ans. As in multicellular organisms, all the cells are not in direct contact with environment. Simple diffusion does not meet the requirement of all the body cells to get sufficient oxygen.

2. What criteria do we use to decide whether something is alive?

Ans. All the living organism must have movement at molecular levels along with respiration and other life process like nutrition, respiration, transportation and excretion to be called alive.

3. What are outside raw materials used for by an organism?

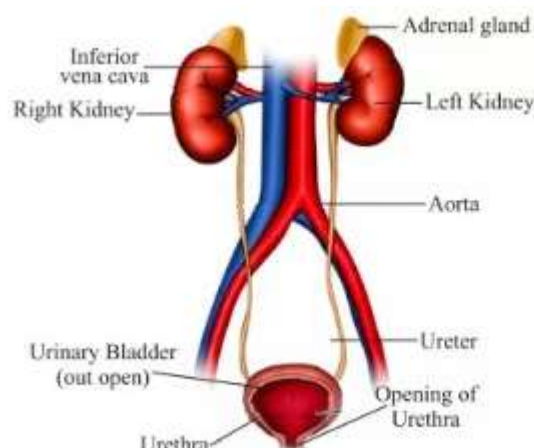
Ans. Outside raw materials used for by an organism includes:

- a. Food
- b. Water
- c. Oxygen

4. What processes would you consider essential for maintaining life?

Ans. The processes essential for maintaining life are

- a. Nutrition
- b. Respiration
- c. Transportation
- d. Excretion



2. What are difference between autotrophic and heterotrophic nutrition?

Ans. Differece between autotrophic and heterotrophic nutrition:

Autotrophic Nutrition	Heterotrophic Nutrition
The mode of nutrition in which an organism makes its own food from the simple inorganic materials like carbon dioxide and water present in the surroundings with the help of sunlight energy. All green plants.	The mode of nutrition in which an organism cannot makes its own food from the simple inorganic materials like carbon dioxide and water present in the surroundings and depends on other organisms for food. All non- green plants.

3. Where do plants get each of the raw materials required for photosynthesis?

- Ans. (a) Carbon dioxide from atmosphere.
(b) Light from Sun
(c) Water from Soil
(d) Chlorophyll from chloroplast of green plants.

3. What is the role of the acids in our stomach?

- Ans. HCl plays following role in our stomach:
(a) Make the medium acidic for action of enzyme pepsin.
(b) Kills the harmful bacteria present in food
(c) Prevents fermentation of food

4. What is the function of digestive enzymes?

Ans. Enzymes break-down the various complex components of food into simple and soluble components so that they can be absorbed easily.

5. How is small intestine deigned to absorb digested food?

Ans. The inner lining of small intestine has numerous finger-like projections called villi which increase the surface area for absorption. The villi are richly supplied with blood vessels which transport the absorbed food to each and every cells of the body. Where, it is utilized to obtaining energy and repair of old tissues.

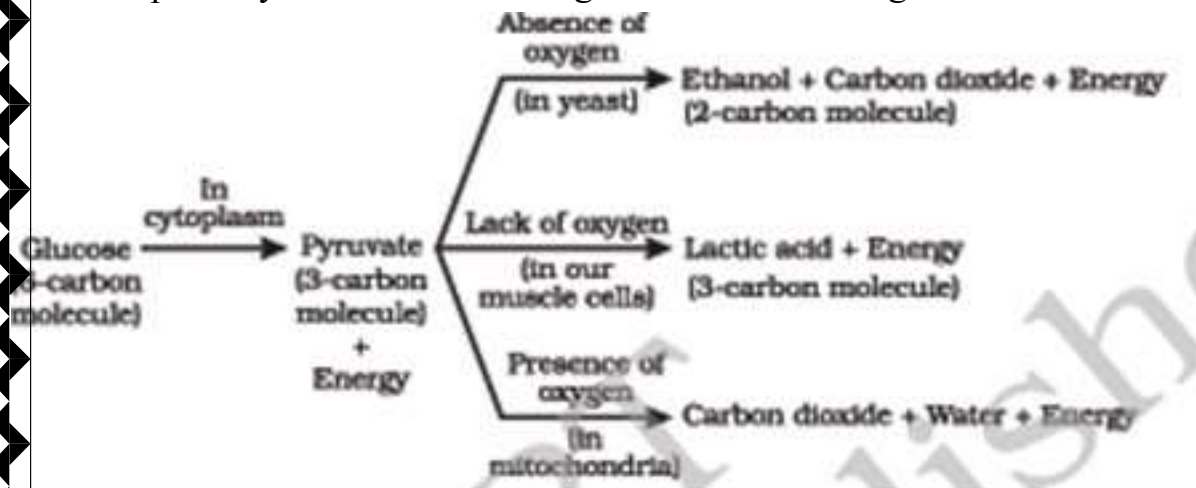
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1. **What advantage over an aquatic organism does a terrestrial organism have with regard to obtaining oxygen for respiration?**

Ans. The rate of breathing is slower in terrestrial organisms as compared to aquatic organisms. This is due to the fact that in water, the amount of oxygen is less as compared to air so, in aquatic organisms the rate of breathing is faster.

2. **What are different ways in which glucose is oxidized to provide energy in various organisms?**

Ans. The pathways of break-down of glucose in various organisms are as below:



3. **How is oxygen and carbon dioxide transported in human beings?**

Ans. In human beings, a pigment hemoglobin is present in RBC which has high affinity for oxygen. RBC takes up the oxygen from the air in the lungs and carry it to tissues which are deficient in oxygen. Some oxygen is carried in dissolved state in blood plasma. Carbon dioxide is more soluble in water than oxygen is mostly transported in the dissolved form in our blood.

4. How are the lungs designed in human beings to maximize the area for exchange of gases?

Ans. In lungs, the bronchioles terminate in balloon-like structures called alveoli. The alveoli contains network of blood capillaries that increase the surface area for exchange of gases.

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1. What are the components of the transport system in human beings? What are the functions of these components?

Ans. The components of human transport system include:

- a) Heart- receives and pumps the blood.
- b) Arteries- carry oxygenated blood away from the heart to various organs.
- c) Veins- Bring back blood to heart.
- d) Capillaries- exchange of various materials and gases between blood and tissues.

2. Why is it necessary to separate oxygenated and deoxygenated blood in mammals and birds?

Ans. The separation of the right and left side of heart is useful to prevent oxygenated blood and deoxygenated blood from mixing. Such separation allows a highly efficient supply of oxygen to the body. This is useful in animals that have high energy needs, such as birds and mammals that constantly use the energy to maintain their body temperature.

3. What are the components of transport system in highly organized plants?

Ans. The transport system of higher plants consists of xylem and phloem. Xylems have vessels and tracheids to transport water and minerals from root to other part of the plants.

Phloem, which consists of sieve tubes and companion cells, transport food from leaves to storage organs and other parts of plant.

How are water and minerals transported in plants?

Ans. Water and minerals are transported in plants through xylem which consists of tracheids and vessels. Water and minerals absorbed by root hairs present in root by osmosis is passed to xylem tissues of root. From root xylem it passes to stem xylem and thus water reaches to leaves.

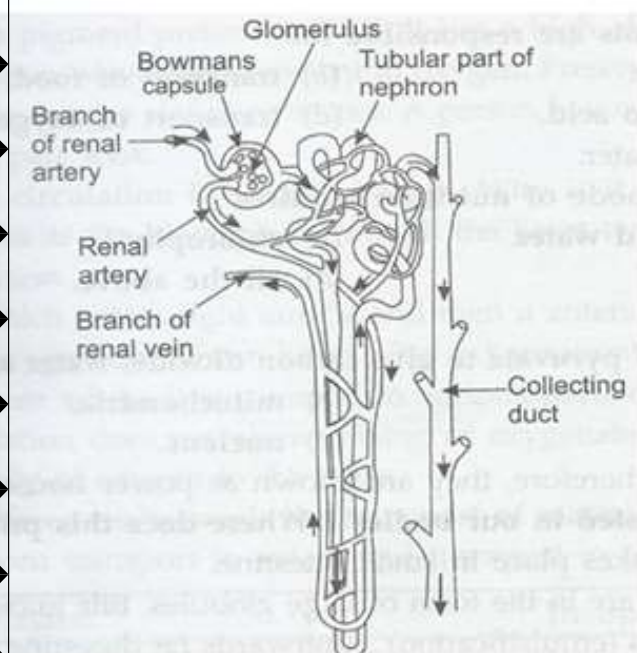
5. How is food transported in plants?

Ans. Food is transported in plants through phloem which consists of sieve tubes, sieve cells and companion cells. The food prepared in leaves in soluble form transported to leaves phloem. Active transport of food passes to all other parts of plants.

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1. Describe the structure and functioning of nephron.

Ans. Each nephron is a cluster of very thin-walled blood capillaries. Each capillary cluster in the kidney called glomerulus is associated with the cup shaped Bowman's capsule that collects the filtered urine. Nephron filters the blood in order to remove nitrogenous waste. They also absorb some useful substance such as glucose, amino acids, minerals and major amount of water from filtrate.



What are the methods used by plants to get rid of excretory products?

- Ans. (i) Plant produces carbon dioxide as wastes during respiration and oxygen as waste during photosynthesis.
- (ii) Excess of water is removed through transpiration.
- (iii) Some waste products like gums and resins are stored in older xylem tissue.

3. How is amount of urine produced regulated?

Ans. The amount of urine depends on how much excess of water is in the body and how much a water soluble waste is to be excreted. If the amount of water and dissolved wastes in body are more than amount of urine will be more and if amount of wastes is less the amount of urine produced will be less.

TEXTBOOK EXERCISE

1. The kidneys in human beings are parts of the system for

- (a) nutrition
- (b) respiration
- (c) excretion
- (d) transpiration

Ans. (c) excretion

2. The xylem in plants are responsible for

- (a) transport of water
- (b) transport of food
- (c) transport of amino acids
- (d) transport of oxygen

Ans. (a) transport of water

3. The autotrophic mode of nutrition requires

- (a) carbon dioxide and water
- (b) chlorophyll
- (c) sunlight
- (d) all of the above

Ans. (d) all of the above

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

- (a) cytoplasm
- (b) mitochondria
- (c) chloroplast
- (d) nucleus

Ans. (b) mitochondria

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

Ans. Digestion of fats takes place in small intestine. Fats entering in intestine are in the form of large globules. Bile juice breaks down these large globules into smaller globules. After that digesting enzyme lipase present in pancreatic juice and intestinal juice converts it into fatty acids and glycerol.

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

Ans. The saliva contains an enzyme called salivary amylase that breaks down starch which is complex molecule into glucose.

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

Ans. Conditions necessary for autotrophic nutrition are:

- (i) Light
- (ii) Chlorophyll
- (iii) Water and
- (iv) Carbon dioxide

By-products are:

- (i) Oxygen and
- (ii) Water

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

Ans. Difference between aerobic and anaerobic respiration:

Aerobic respiration	Anaerobic respiration
(i) Takes place in presence of oxygen.	(i) Takes place in absence of oxygen
(ii) Complete oxidation of glucose occurs.	(ii) Incomplete oxidation of glucose occurs.
(iii) More energy is produced.	(iii) Less energy is produced

Anaerobic respiration takes place in yeast, some bacteria and some internal parasites like tapeworm.

9. How are the alveoli designed to maximize the exchange of gases?

Ans. The walls of the alveoli is folded and has large surface areas. It contain an extensive

network of blood vessels which provide a surface where the exchange of gases can take place.

10. What would be the consequence of a deficiency of hemoglobin in our bodies?

Ans. Haemoglobin is a pigment present in RBC. It has a high affinity for oxygen. It carries oxygen from lungs to various tissues which are deficient in oxygen. Presence of less hemoglobin will result in less supply of oxygen to tissues. A person having less hemoglobin will get tired soon and will have a pale look.

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

Ans. In mammals and birds the blood goes through the heart twice during each cycle. This is known as double circulation. Deoxygenated blood which enters right auricle and then it enters the right ventricle from where it is pumped to lungs for oxygenation. From lungs after oxygenation it comes to left auricle and then enters left ventricle from where it is pumped to various parts of body.

Such system of circulation does not allow mixing of oxygenated and deoxygenated blood which allows efficient supply of oxygen to the body.

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

Ans. Difference between transport in xylem and phloem:

Xylem	Phloem
a. Xylem transport minerals and water from root to leaves.	a. Phloem transport food from leaves to root and storage organs.
b. Transport is unidirectional.	b. Transport is bidirectional.
c. Xylem consists of trachieds and vessels.	c. Phloem consists of sieve tubes and companion cells.

13. Compare the functioning of alveoli in the lungs and nephron in the kidneys with

respect to their structure and functioning.

Ans. Comparison between alveoli and nephron:

Alveoli	Nephron
They have thin-walled balloon-like structure. The alveoli provide a surface extensively supplied with blood capillaries for exchange of gases in lungs. Carbon dioxide released in the cavity of alveoli and oxygen is taken by hemoglobin present in RBC of blood.	Nephron is a cluster of very thin walled blood capillaries found in kidney. Each capillaries cluster remains associated with the cup-shaped end of a tube called Bowman's capsule that collects the filtered urine, at the same time the useful substance are reabsorbed.

Small Intestinal →

