4. To Release Energy

Let us assess

1. Question

Reason for the diffusion of oxygen from alveoli to blood.

A. Low concentration of oxygen in blood

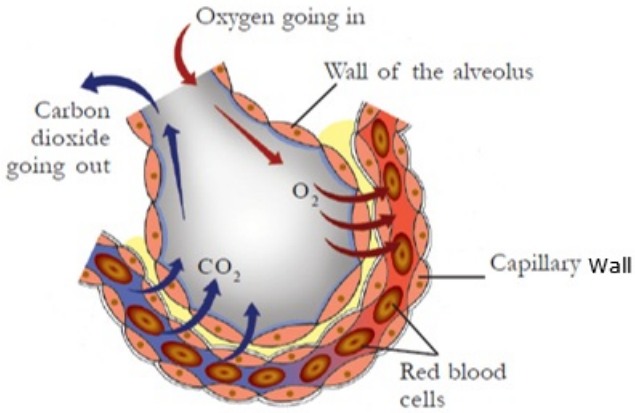
B. As the walls of the alveoli and blood vessels are thin

C. High concentration of oxygen in alveoli

D. All the above.

Answer

During inspiration, the concentration of oxygen inside the alveoli or air sacs (sac like structures present at the end of bronchioles) is higher than the blood capillaries surrounding the alveoli. The wall of the alveoli is thin, as result oxygen from alveoli diffuses into blood capillaries.



Exchange of gases at alveoli

2. Question

Observe the two reactions given below.

Reaction 1 $C_6H_{12}O_6 + 6O_2 \longrightarrow 6CO_2 + 6H_2O + \text{Energy}$

Reaction 2 $6CO_2 + 6H_2O \xrightarrow{\text{Light}} C_6H_{12}O_6 + 6O_2$

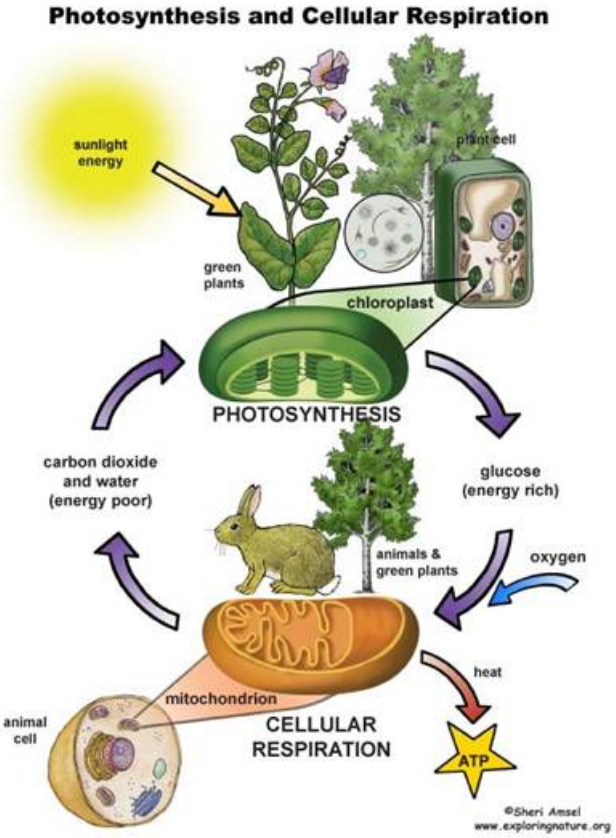
a) Identify the process occurring in plants and in animals.

b) Which is the process that takes place only in plants?

Answer

a) Reaction 1 represents the process of aerobic respiration (a type of cellular respiration which takes place in presence of oxygen). In the respiration, sugar (glucose) is oxidised to carbon dioxide, water and releases energy in the form of ATP (adenosine tri- phosphate). it takes place in the mitochondria of the cell.

b) Reaction 2 represents the process of photosynthesis in green plants. In this process green plants makes food (glucose) in presence sunlight, carbon dioxide and water. Oxygen is formed as by-product in the process.



3. Question

Explain the role played by haemoglobin in the transportation of oxygen and carbon dioxide.

Answer

I. Haemoglobin is an iron containing protein is present in the red blood cells (RBC).

II. It is a respiratory pigment that carries oxygen through red blood cells.

III. It transports about 97% of oxygen from lungs to the tissues and in returns it transports carbon dioxide from tissues to the lungs.

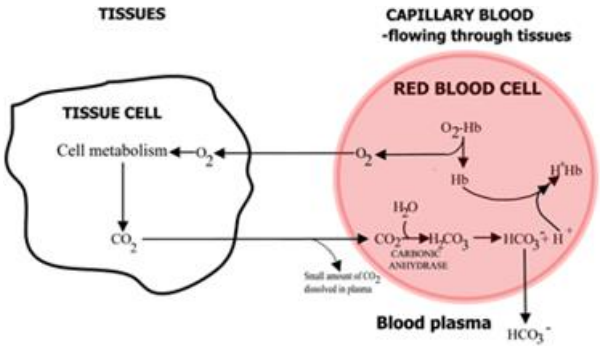
IV. Oxygen enters the body in the lungs, where it attaches to haemoglobin and carries blood to the body tissues.

V. In the tissues oxygen is removed from the blood, the blood cells are considered deoxygenated, and they flow back through the heart by veins.

VI. While passing through the body, blood picks up carbon dioxide as waste, which attaches to haemoglobin to form carboxyhaemoglobin.

VII. Carbon dioxide is also transported through blood plasma as bicarbonate(HCO_3) ions.

VIII. At the end of the cycle, carbon dioxide passes through the lungs and out of the nose.



Extended activities

1. Question

Smoking is suicide and murder at the same time. Prepare a poster for the Health Club of your school based on the above statement.

Answer

2. Question

Interview a medical practitioner preparing a questionnaire on the topic 'Increasing Lung Diseases'.

Answer

List of questions from a questionnaire on 'Increasing Lung Diseases'.

1. Why most of the patient visit you, have problem in lungs or in respiratory tract?

2. Do you suspect my symptoms are related to any of the lung diseases such as asthma pulmonary fibrosis or lung cancer?

3. What is the name of the lung disease you suspect is responsible for causing my respiratory symptoms?

4. What types of diagnostic tests will be performed to confirm or rule out this diagnosis?

5. If I diagnosed with lung disease, is my condition acute or chronic?

6. Is it congenital (hereditary) or related to smoking or my environment?

7. Is there a cure for this lung disease?