

Science

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(Chapter 6)(Life Processes)

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Question 1:

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

Answer 1:

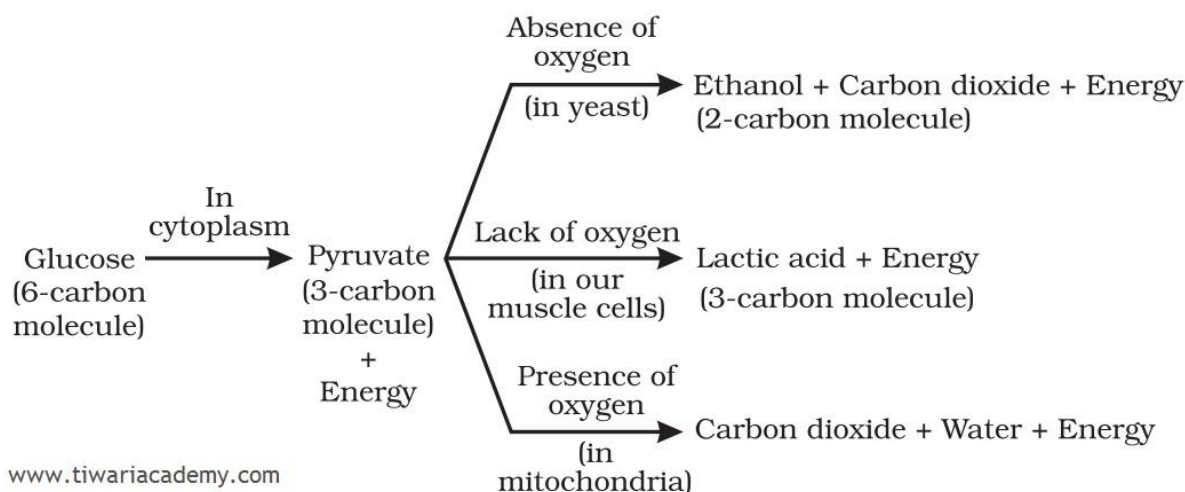
Since the amount of dissolved oxygen is fairly low compared to the amount of oxygen in the air, the rate of breathing in aquatic organisms is much faster than that seen in terrestrial organisms. Therefore, unlike aquatic animals, terrestrial animals do not have to show various adaptations for better gaseous exchange.

Question 2:

What are the different ways in which glucose is oxidised to provide energy in various organisms?

Answer 2:

Glucose is first broken down in the cell cytoplasm into a three carbon molecule called pyruvate. Pyruvate is further broken down in the following ways to provide energy:



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Question 3:

How is oxygen and carbon dioxide transported in human beings?

Answer 3:

Haemoglobin transports oxygen molecule to all the body cells for cellular respiration. The haemoglobin pigment present in the blood gets attached to O_2 molecules that are obtained from breathing. It thus forms oxyhaemoglobin and the blood becomes oxygenated. This oxygenated blood is then distributed to all the body cells by the heart. After giving away O_2 to the body cells, blood takes CO_2 which is the end product of cellular respiration. Now the blood becomes de-oxygenated.

Since haemoglobin pigment has less affinity for CO_2 , CO_2 is mainly transported in the dissolved form. This de-oxygenated blood gives CO_2 to lung alveoli and takes O_2 in return.

Question 4:

How are the lungs designed in human beings to maximise the area for exchange of gases?

Answer 4:

The exchange of gases takes place between the blood capillaries that surround the alveoli and the gases present in the alveoli. Thus, alveoli are the site for exchange of gases. The lungs get filled up with air during the process of inhalation as ribs are lifted up and diaphragm is flattened. The air that is rushed inside the lungs fills the numerous alveoli present in the lungs. Each lung contains 300-350 million alveoli. These numerous alveoli increase the surface area for gaseous exchange making the process of respiration more efficient.

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