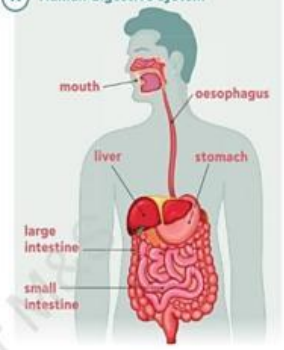
Garcilaso School

RESPIRATION IN CELLS

Glucose from food

All living things require energy to carry out the seven life processes. Humans get the energy they need through food. Food is broken down by digestion so that it can be used by the body. Food starts being broken down in the mouth, then it passes through the oesophagus to the stomach and finally to the small intestine where nutrients are broken down into smaller substances. Some kinds of food, like rice and bread, contain nutrients called carbohydrates. The digestive system breaks down these carbohydrates into glucose. Glucose is a kind of sugar. It diffuses from the small intestine into the blood and is carried to all the cells around the body. There glucose diffuses from the blood into the cells because cells have a lower concentration of glucose. Every cell in the body uses glucose to release the energy needed.

A Human digestive system



The process of respiration

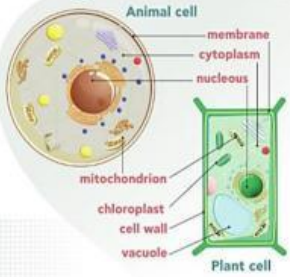
Energy is stored in glucose in the form of chemical energy. During the process of respiration, the stored energy is released and transferred into energy that the cells can use. The process takes place in structures of the cells, called mitochondria. Mitochondria are parts of plant and animal cells. This means that both plants and animals respire.

Respiration is a chemical reaction. When oxygen is required, it is called aerobic respiration. During aerobic respiration, glucose and oxygen react to form carbon dioxide and water. The word equation that describes this reaction is:

Word equation for aerobic respiration:
glucose + oxygen → carbon dioxide + water

Aerobic respiration releases a lot of energy, but slowly. Most of this energy is used by cells to carry out life processes, and some of it is transferred to heat energy.

B



? How do the reactants of aerobic respiration get into our body?



Dive into Science

Anaerobic respiration and our body

Respiration can happen without oxygen too. This happens when there is not enough oxygen reaching the cells. This is called anaerobic respiration, which releases much less energy than aerobic respiration but more quickly. During anaerobic respiration, lactic acid is formed. Lactic acid builds up in muscles after hard exercise causing pain which may lead to cramps and make us feel tired. After exercise we continue to breathe quickly so that oxygen breaks down the lactic acid to form carbon dioxide and water.

Respiration and breathing

We often confuse respiration and breathing, probably due to the name of the body system, the respiratory system, which involves both processes. Breathing, as we have already learnt, is the process of taking air in and out of the lungs, while respiration is the process that takes place in cells and releases energy from glucose.

HOMEWORK

DRAW

- RESPIRATORY SYSTEM
- CIRCULATORY SYSTEM
- DIGESTIVE SYSTEM

LIVEWORKSHEETS