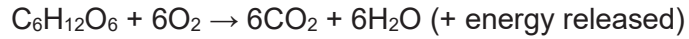


Knowledge Organiser Y8: Respiration

The Respiratory System

Aerobic Respiration

glucose + oxygen → carbon dioxide + water (+ energy released)



Anaerobic Respiration (in muscle cells)

glucose → lactic acid (+ energy released)

Anaerobic Respiration (in plants and yeast)

glucose → ethanol + carbon dioxide

Glucose

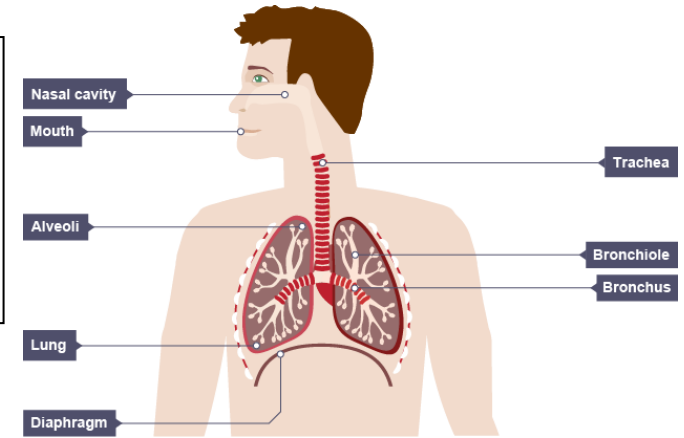
Glucose (from our diet) is absorbed into the blood once it reaches the small intestine.

It then travels in the blood to the body's cells.

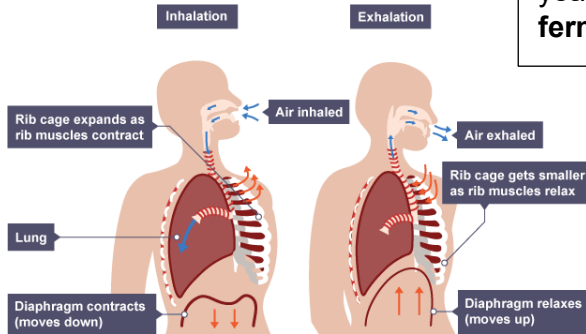
The impact of exercise

Muscles need energy to contract. While exercising, the muscles need additional energy therefore:

- The **breathing rate and volume of each breath increases** to bring more oxygen into the body and remove the carbon dioxide produced.
- The **heart rate increases**, to supply the muscles with extra oxygen and remove the carbon dioxide produced.

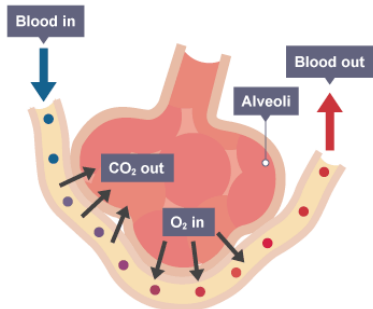


Breathing



Anaerobic respiration in yeast cells is known as **fermentation**.

Gas Exchange



Gas exchange occurs at the **alveoli** in the lungs and takes place by **diffusion**. **Diffusion** is the movement of gas from an area of high concentration to an area of low concentration.

The alveoli are surrounded by **capillaries**. Both the capillaries and alveoli walls are **very thin** - just one cell thick. They are made of **semi-permeable membranes** which allow oxygen and carbon dioxide to pass through them.

Smoking

Tobacco smoke contains many harmful substances. These include:

Tar	Causes cancer of the lungs, mouth and throat.
Smoke	Damages the cilia (cells in the trachea and bronchi with hairs that move mucus containing microbes out of the lungs). As a result of this, smokers cough to move the mucus and are more likely to get bronchitis.
Nicotine	Nicotine is addictive. It also increases the heart rate and blood pressure, and makes blood vessels narrower than normal. This can lead to heart disease.
Carbon Monoxide	Carbon monoxide is a gas that takes the place of oxygen in red blood cells. This reduces the amount of oxygen that the blood can carry.