

## Fit and healthy

Being fit means that your body can cope with the activities that you need to do. To stay fit you should eat a balanced diet, exercise regularly, avoid smoking and avoid alcohol and drug abuse. If you follow these rules your heart will stay healthy and you will be less likely to suffer from high blood pressure and other circulatory problems like **heart disease** (when heart muscle cells start to die).

During exercise muscle cells need more energy. This is obtained from a sugar called glucose by the process of **aerobic respiration**. This is the **word equation**:

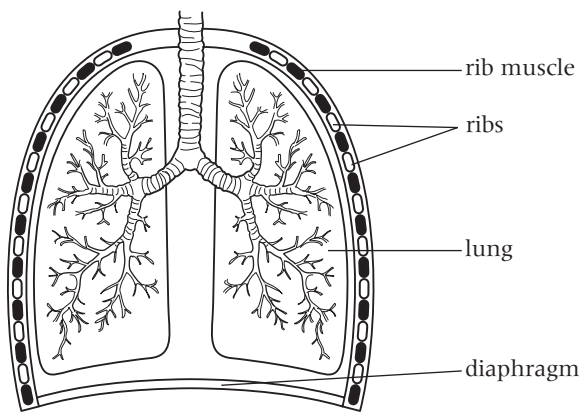


There are several organ systems involved to allow respiration to occur in muscle cells.

- The **respiratory** (or breathing) **system** supplies the oxygen and removes the carbon dioxide.
- The **digestive system** provides the glucose.
- The **circulatory system** carries the glucose and oxygen to the muscle cells, and carries the carbon dioxide away to the lungs.

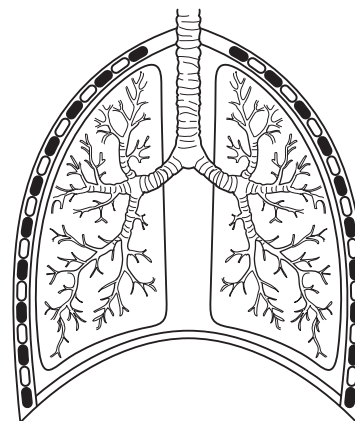
When you exercise your **breathing rate** (number of breaths in one minute) and your **pulse rate** (number of times your heart beats in one minute) increase. This is because your cells need more oxygen and glucose for respiration.

Breathing is carried out by two sets of muscles, the **diaphragm** and the **rib muscles** (found between the ribs). These change the volume of the chest. Breathing **ventilates** (moves air into and out of) the lungs.



Breathing in (*inhalation*).

- Diaphragm contracts and moves downwards.
- Rib muscles contract and lift ribs up and outwards.
- The volume of the chest increases.
- Air flows into the lungs.



Breathing out (*exhalation*).

- Diaphragm relaxes and moves upwards.
- Rib muscles relax and move ribs down and inwards.
- The volume of the chest decreases.
- Air flows out of the lungs.

**Drugs** are chemicals that affect how the body works. Cigarettes contain a drug called **nicotine** which is addictive (you feel that you cannot do without it). The chemicals in cigarette smoke can cause diseases.

Poison in cigarette smoke	Harm it causes
nicotine	Makes arteries narrower, causes heart disease.
tar	Clogs up the lungs and stops the <b>cilia</b> working, causes <b>cancer</b> and <b>bronchitis</b> .
carbon monoxide	Stops red blood cells carrying so much oxygen.

**Medicines** are drugs that can help people who are suffering from diseases, e.g. **antibiotics**. **Recreational drugs** are legal drugs that people take because they like the effect that they have on their body, e.g. **caffeine** in coffee and **alcohol**. **Illegal drugs** include **heroin** and **Ecstasy**.

Drugs that slow down the **nervous system** are called **depressants**. Alcohol is a depressant. It alters behaviour and slows reaction time. Drugs that speed up the nervous system are called **stimulants**, e.g. caffeine. Misuse of any drug can be harmful especially to the liver.

A **balanced diet** is essential to health. It is made up of the correct amounts of the following seven food substances: carbohydrates, fats, proteins, vitamins, minerals, water and fibre.

A shortage of a particular substance can cause a specific **deficiency disease**.

Eating too much of a particular substance can also cause problems. Too much fat can cause **obesity** and **heart disease**.

**Muscles** move bones at joints. Muscles cannot push and so joints need pairs of muscles (**antagonistic pairs**) to pull in opposite directions. One muscle **contracts** and gets shorter and fatter, to pull a bone. At the same time the other muscle in the pair **relaxes** and gets longer and thinner.

Exercise strengthens bones and muscles. Too much exercise can damage muscles and joints.

