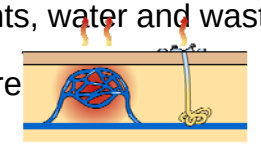
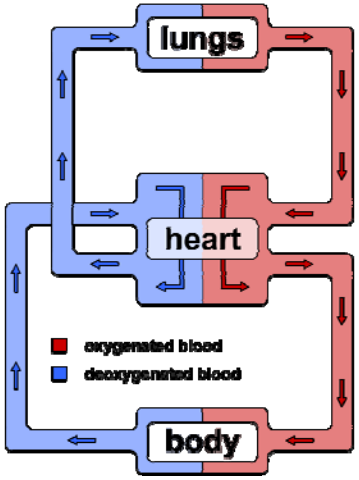
The cardiovascular system has three functions:

1. **Transporting** substances around the body. These include oxygen, glucose, carbon dioxide, nutrients, water and waste products.

2. **Controlling** body temperature



3. **Protecting** the body. Blood contains cells and antibodies that fight infection and clotting agents to stop bleeding.



When blood passes through the lungs it becomes **oxygenated** – red blood cells absorb oxygen.

As the blood moves around the body it becomes **deoxygenated** – oxygen is released into body cells

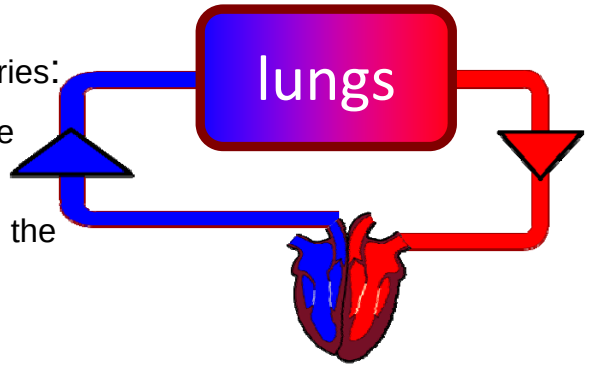
Blood cells absorb the waste product **carbon dioxide** from body cells. It is carried back to the lungs where it is removed

The double pump system

The **pulmonary circulation** carries:

1) **Deoxygenated** blood from the heart to the lungs

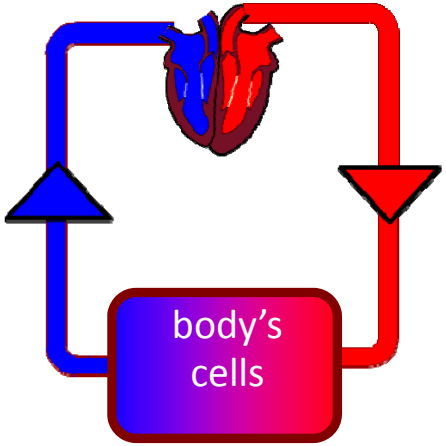
2) **Oxygenated** blood back from the lungs to the heart, ready to be pumped out to the body.

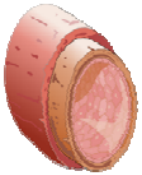


The **systemic circulation** carries:

1) **Oxygenated** blood to the rest of the body through the arteries

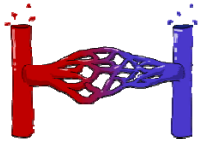
2) **Deoxygenated** blood back to the heart through the veins.





A **vein** takes deoxygenated blood back to the heart. They are low pressured. They have valves to prevent the backflow of blood.

An **Artery** take oxygenated blood away from the heart to the working muscles. They have high pressure in them to cope with the heart pushing blood round the body. They are think and stretchy.



Capillaries carry blood to and from the body's cells. For example the alveoli are covered in capillaries to aid gaseous exchange.

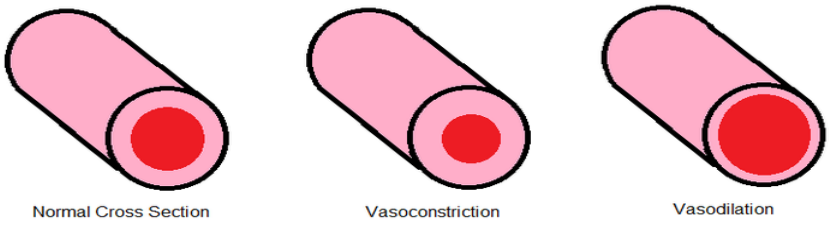
Maximum Heart Rate (MHR) = 220 – age (the fastest that the heart is able to beat)

Stroke volume is the amount of blood pumped out of the left ventricle per beat.

Cardiac output is the amount of blood pumped out of the left ventricle of the heart per minute.

cardiac output = stroke volume × heart rate

The body uses two mechanisms to control this redistribution. **Vasoconstriction (narrowing)** and **Vasodilation (expanding)** is used to redistribute blood to essential areas of the body while decreasing blood flow to others.

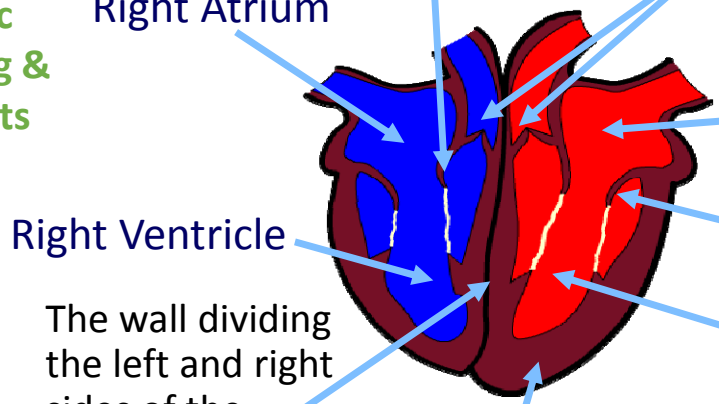


The immediate effects of exercise on the cardiovascular system?

Increase in HR, Increased Stroke Volume, Increased cardiac output, increased blood pressure (systolic), Blood shunting & Vasodialation, increase in skin temperature, waste products leave via sweat.

The long term effects of exercise on the cardiovascular system?

Decrease in RHR,, NUMBER OF REDBLOOD CELLS Increase, Heart size increase (CARDIAC HYPERTROPHY), Blood pressure decrease, number of capillaries increase, Heart becomes more efficient, beats with stronger contractions



The **semi-lunar valves** prevent expelled blood flowing back into the heart.

Bicuspid (mitral) valve

The wall dividing the left and right sides of the heart is called the **septum**.

The walls are made of **cardiac muscle.**

The Bi & Tri Cuspid valves prevent blood flowing back into the atria from the ventricles.