

Science Knowledge Organiser

Year 6 Spring (ii)

What are the main parts of the circulatory system?

Substantive Knowledge- what will we learn?

The body's **circulatory system** is responsible for transporting nutrients, water and oxygen to the billions of cells all around your body. It also carries away **waste**, such as **carbon dioxide**, that the cells produce. It is an amazing system that travels through your entire body connecting all your body cells.

Disciplinary Knowledge – How will we learn?

Structure & function - The different parts of the circulatory system

Cause & effect - The effect of drugs on the body

Process - How water and nutrients are transported around living things

Observing - The circulatory system at work.

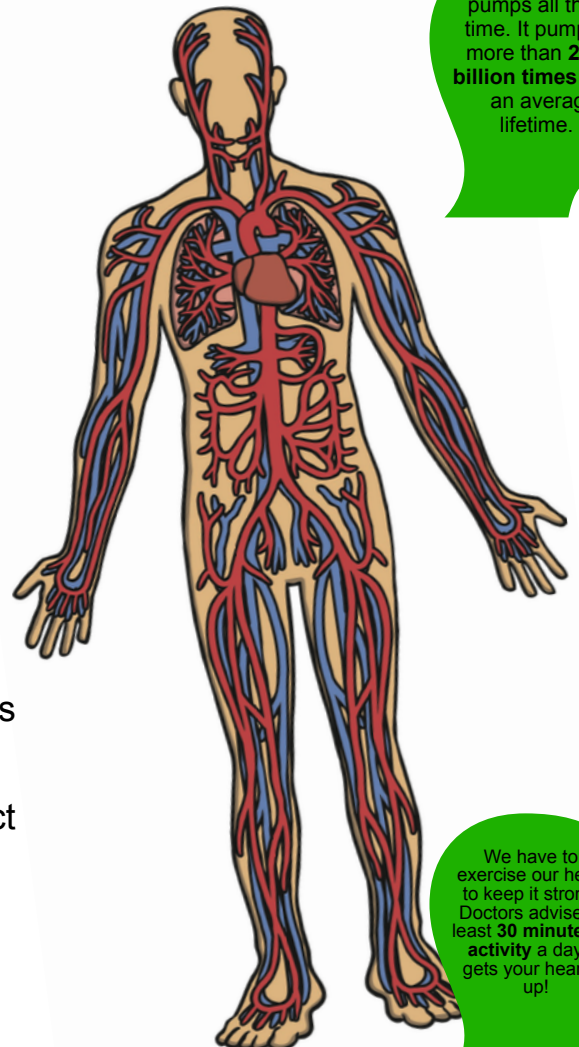
Predicting - Consider what would happen if the arteries were blocked on the circulatory system or to the heart rate after exercise.

Quantifying - Measuring level of activity and the impact of this on the pulse

Controlling Variables - What to change to answer a question asked and what to keep the same- explaining the reason for this

Interpreting and Inferring - Interpreting results

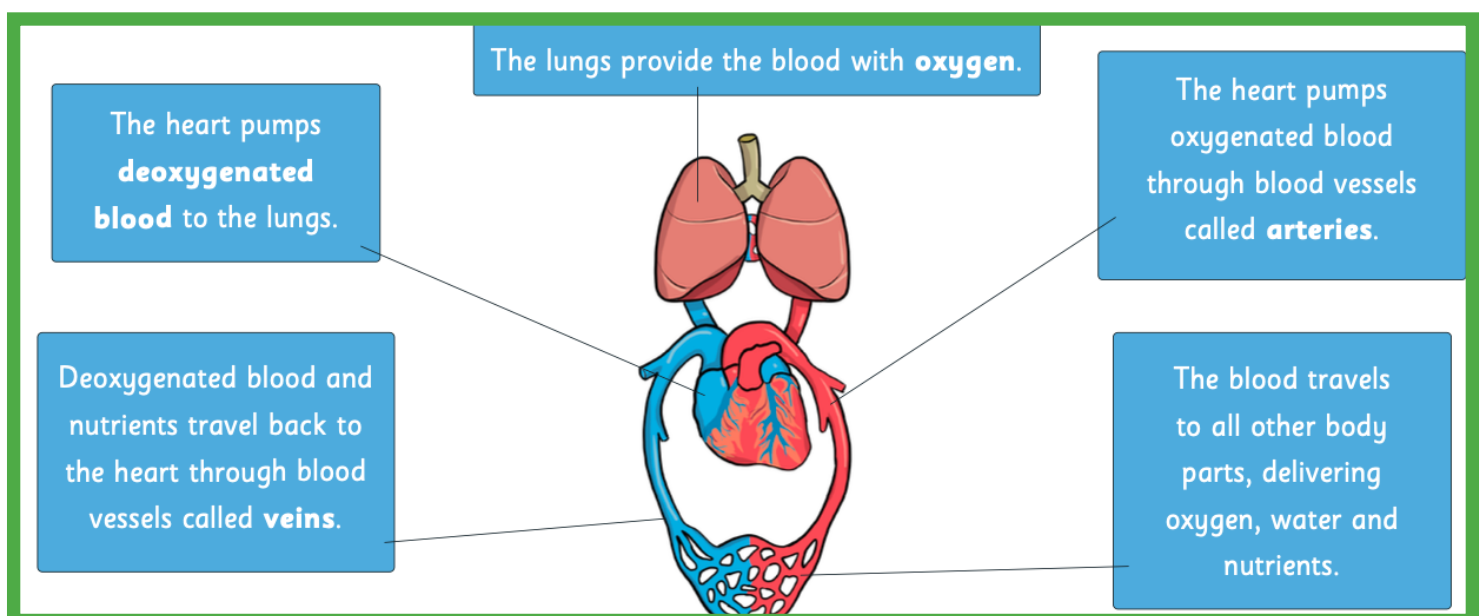
Forming Conclusions - Drawing conclusions from the investigations we have done combined with our scientific knowledge



The heart pumps all the time. It pumps more than **2.5 billion times** over an average lifetime.

We have to exercise our heart to keep it strong. Doctors advise at least **30 minutes of activity** a day that gets your heart rate up!

The Human Circulatory System



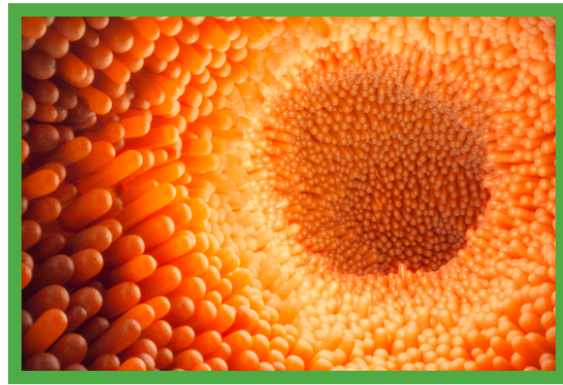
Absorbing Water and Nutrients

We absorb water and nutrients through the food we eat. The **small intestine** is lined with villi. **Villi** have veins and arteries running through them.

The blood in the arteries delivers **oxygen** to the intestine.

Nutrients are absorbed into the blood, which are then taken away to other parts of the body.

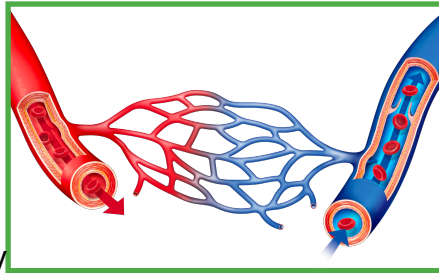
Water is also absorbed in this way. The blood carries the water and nutrients to the parts of the body that need it.



An average-sized adult carries about **5 litres of blood**.

Capillaries and Arteries

Capillaries are the smallest blood vessels in the body and it is here that the exchange of water, nutrients, oxygen and carbon dioxide takes place. Arteries carry **oxygenated** blood away from the heart. Veins carry **deoxygenated** blood toward the heart.



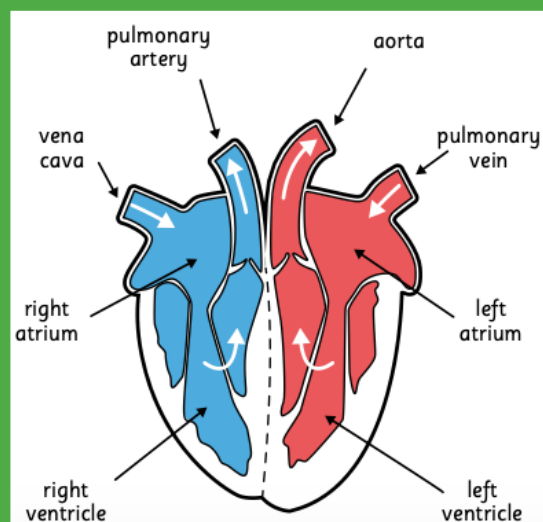
If you linked up all of the body's blood vessels, including arteries, capillaries, and veins, they would measure over 60,000 miles.

Diet and Lifestyle

Fatty rich foods can clog **arteries** and veins, preventing blood from delivering what is needed. Exercise can improve the health of a person by removing fatty deposits from the body. Some exercises are called **cardiovascular**, and are designed to improve the fitness of the overall **circulatory system** by strengthening the organs and pulse rate.

The Function of the Heart:

- 1 **Deoxygenated** blood flows into the heart from the body through the veins
- 2 This blood is pumped out to the lungs through the **pulmonary artery**
- 3 Blood is then **oxygenated** in the lungs
- 4 Blood returns to the heart through the **pulmonary vein**
- 5 The oxygenated blood is then pumped out of the heart through the **aorta**
- 6 The blood travels around the body delivering oxygen and nutrients to the organs.



Mammals have hearts with four chambers. Notice how the blood that has come from the body is **deoxygenated**, and the blood that has come from the lungs is **oxygenated** again.

Components of blood

Plasma

Transports nutrients, hormones, and proteins. It is a yellow liquid that makes up about 55% of the body's blood volume.

Red blood cells

Carry fresh oxygen through the body and remove carbon dioxide. Red blood cells make up about 40 to 45% of blood.

White blood cells

Part of the body's immune system, detect and fight viruses and bacteria. There are five major types of white blood cells, and they make up less than 1% of blood.

Platelets

Form clots to stop bleeding. Platelets make up less than 1% of blood.



Source: American Society of Hematology

Core Vocabulary

circulatory system - A system which includes the heart, veins, arteries and blood transporting substances around the body.

Heart - An organ which constantly pumps blood around the circulatory system.

Blood Vessels - The tube-like structures that carry blood through the tissues and organs. Veins, arteries and capillaries are the three types of blood vessels.

Drug - A substance containing natural or man-made chemicals that has an effect on your body when it enters your system.