



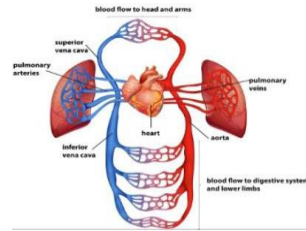
Knowledge

Which organs of the body make up the circulatory system and where are they found?

Identifying and Classifying

The heart is composed of four chambers: the right atrium, the right ventricle, the left atrium and the left ventricle. How often your heart pumps is called your pulse.

The direction in which blood travels through the circulatory system is as follows:

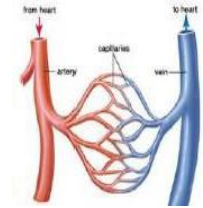


- The right atrium collects the deoxygenated blood from the body, via the vena cava. It sends blood to the right ventricle.
- The right ventricle pumps the deoxygenated blood to the lungs. Here the blood picks up oxygen and disposes of carbon dioxide.
- The lungs send oxygenated blood back to the left atrium, which pumps it to the left ventricle.
- The left ventricle pumps the blood to the rest of the body, via the aorta.

What is the function of each blood vessel and how is it designed to do its job?

Identifying and Classifying

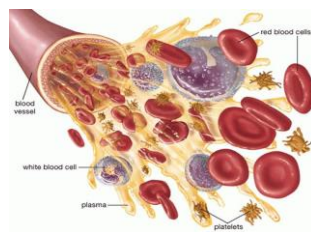
There are three types of blood vessel within the human body. Arteries carry oxygenated blood from the heart to the rest of the body. Veins carry deoxygenated blood from the body to the heart. Nutrients, oxygen and carbon dioxide are exchanged via the capillaries. The closest blood vessels to the heart are the aorta, the main artery, and the vena cava, the main vein.



What are the components of the blood? What job does each of the components do?

Pattern Seeking

There are four main components of the blood, which all have specific roles within the body:

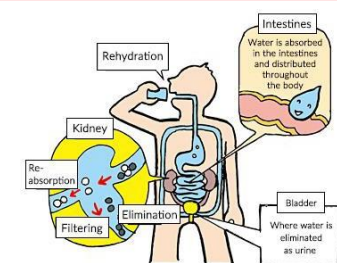


- Red blood cells – these are disc shaped and transport oxygen around the human body;
- White blood cells – these are a key part of the immune system and help protect the body against disease;
- Platelets – these are tiny, oval shaped cells that help the blood to clot and repair cuts to the skin;
- Plasma – this is a yellowish fluid that carries nutrients and waste products, as well as the three other components of the blood.

Where in our body do we absorb water? How are those organs designed to do this?

Research

As food passes through the digestive system, it is gradually broken down more and more. By the time it reaches the intestines, it is largely liquid, and in the small intestine water is absorbed and the remains of the food dries out to become waste. Any excess water and waste in the bloodstream is removed in the kidneys and sent to the bladder as urine. How are these organs shaped? What is the specific job of the components of these organs, such as the nephrons in the kidney?



<p>What is the relationship between diet, exercise, drugs, lifestyle and our health?</p>	<p>Research Our health can be both improved and harmed by the choices we make in our day to day lifestyles. Diet, exercise and drugs can have benefits if we think about them appropriately and make decisions that will keep us healthy. However, making poor decisions or choosing not to think about them appropriately can lead to short-term and long-term health problems. Which types of food would help to create a balanced diet and how does the Eatwell Plate help us to understand this? Why are some drugs important for people to take if they want to enjoy good health? What would you expect to happen if you did little, or no, exercise? Do you think you could make unhealthy choices in some areas and still enjoy good health? Why?</p>
<p>How can drugs and exercise affect my organs? What impact can they have? How can they benefit my body?</p>	<p>Identifying and Classifying Some choices, such as smoking and drinking alcohol, can be harmful to our health. Tobacco can cause short-term effects such as shortness of breath, difficulty sleeping and loss of taste, and long-term effects such as lung disease, cancer and death. Alcohol can cause short-term effects such as addiction and loss of control, and long-term effects such as organ damage, cancer and death. Exercise can have many benefits for the whole body, including: toning our muscles, reducing fat, increasing fitness, strengthening the heart, improving lung function, improving skin and making a person feel physically and mentally healthier.</p>
<p><i>How have lifestyles changed over the last 100 years? Why might our current lifestyles have a negative effect on our health?</i></p>	<p>Ideas Over Time There have been many changes in lifestyle since the beginning of the 20th century, when reports by people such as Rowntree and Booth showed that a large number of people in Britain's cities were living in poverty and suffered from ill health. Since then, and with the help of the NHS since it was founded in 1948, we have learnt more about the effects of alcohol, smoking and diet on our bodies and healthy lifestyles are promoted through campaigns like 'Smokefree' and '5-a-day'. What other changes can you think of? Unfortunately, as Britain has become wealthier, people's diets have become less healthy which has led to diseases such as cancer, diabetes and heart disease becoming more common. There are also still issues surrounding alcohol and a lack of exercise as our lives get busier and busier.</p>
<p><i>Why was the work of Professor Sir Richard Doll so ground-breaking?</i></p>	<p>Research Professor Sir Richard Doll (1912-2005) https://www.youtube.com/watch?v=VBWGM630zG0 [Doll's work and reputation] https://www.youtube.com/watch?v=3CmLHeoN6u0 [Interview with Doll] British physician and researcher into the links between smoking and health.</p>
<p>Which type of exercise has the greatest effect on our heart rate?</p>	<p>Comparative Testing There are four different types of exercise: endurance/aerobic, strength to help build muscles, balance and flexibility/stretching. What investigation could be done to test all four of these fairly? What are the variables? How will you record the results? Based on your understanding of these exercise types and what you know about the human body, which type of exercise do you predict will have the greatest effect? Why?</p>
<p><i>If I exercise every day for a month, does it influence my resting heart rate?</i></p>	<p>Observing Over Time If exercise is beneficial for improving physical and mental health, this would suggest that there will be a positive effect on a person's resting heart rate. How can this be investigated and proved or disproved? What variables need to be considered? Do you think the influence would be the same for all four types of exercise? Why/why not?</p>
<p>What effect do certain foods/ drinks have on my heart rate?</p>	<p>Comparative Testing The three main groups of nutrients that we need to survive are carbohydrates, protein and fats, but we do also need other food types to enjoy a balanced diet. What investigation could be done to test each food type for its singular effect on heart rate? Are there any other variables to consider? How will you record the results? Based on your understanding of these food types and what you know about the changes in lifestyle and diet over the last 100 years, which food type do you predict will have the greatest effect? Do you predict an increase or decrease in heart rate for each food type? Why?</p>
<p><i>Why are ready meals and convenience foods causing obesity levels to rise?</i></p>	<p>Ideas Over Time Most convenience foods and ready meals have high salt and fat content – this is partly to preserve the food and help it to last longer, but also means that other nutrients and food types are less important and the number of calories (units of energy) in the meal is higher. When we eat and drink more calories than we use up, our bodies store the excess as body fat, which means we may put on extra weight over time. A healthy man needs approximately 2,500 calories a day, whilst a woman needs approximately 2,000 calories.</p>



Vocabulary

Aorta	The main artery through which blood leaves the heart before it flows through the rest of the body.
Arteries	Tubes in the body that carry oxygenated blood from the heart to the rest of the body.
Atrium	One of the chambers of the heart .
Blood vessels	The three types of narrow tubes through which blood flows: arteries, veins and capillaries .
Capillaries	Tiny blood vessels in the body.
Carbon dioxide	A gas produced by animals and humans breathing out.
Circulatory system	The system responsible for circulating blood through the body, supplying nutrients and oxygen whilst removing waste products such as carbon dioxide .
Deoxygenated	Blood that does not contain oxygen .
Heart	The organ in a human's chest that pumps blood around the body.
Lungs	Two organs inside the chest which fill with air during respiration . They oxygenate the blood and remove carbon dioxide from it.
Nutrients	Substances that help plants and animals to grow.
Organ	A part of the body that has a particular purpose.
Oxygen	A colourless gas that plants and animals need to survive.
Oxygenated	Blood that contains oxygen .
Pulse	The regular beating of blood through the body. The speed of someone's pulse depends on the activity they are doing.
Respiration	The process of respiring/breathing/inhaling and exhaling air. This process is also known as ventilation .

Hurst Hill Primary School Knowledge Organiser

Science

Animals including humans

Year 6

Summer 1

Biology

Biology is the science that understands living organisms, including animals and plants.

Statutory requirements

Pupils should be taught to:

- identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood
- recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function
- describe the ways in which nutrients and water are transported within animals, including humans.