'Bringing Learning to Life: No Limits.No Barriers.'

Ocean Academy Poole
an Aspirations Academy
Self-Worth | Engagement | Purpose

Learning Journey Map

Year: **6** Term: **SUMMER 1**
Subject: **SCIENCE** Topic: **ANIMALS INCL. HUMANS**

Driving Question: See Enterprise: Make £5 Grow
Power Skill: **S**ee Enterprise: Make £5 Grow

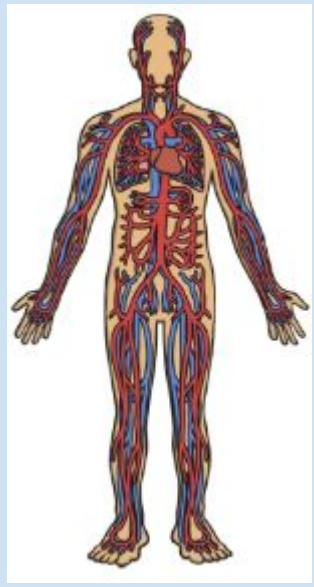
National Curriculum Learning Objectives

- 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

Key Vocabulary

oxygen	carbon dioxide	heart	blood vessels	artery
vein	capillary	atrium	ventricle	red blood cells
white blood cells	platelets	plasma	lungs	

Key Learning

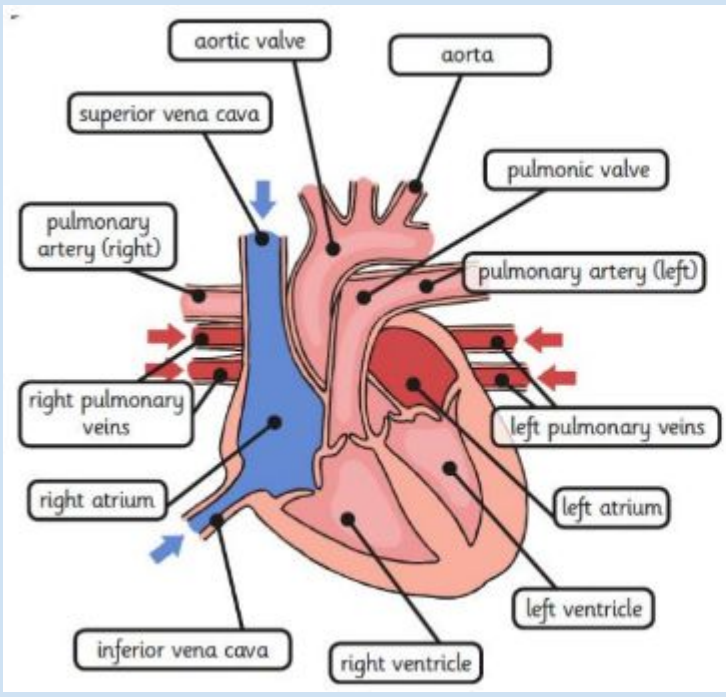


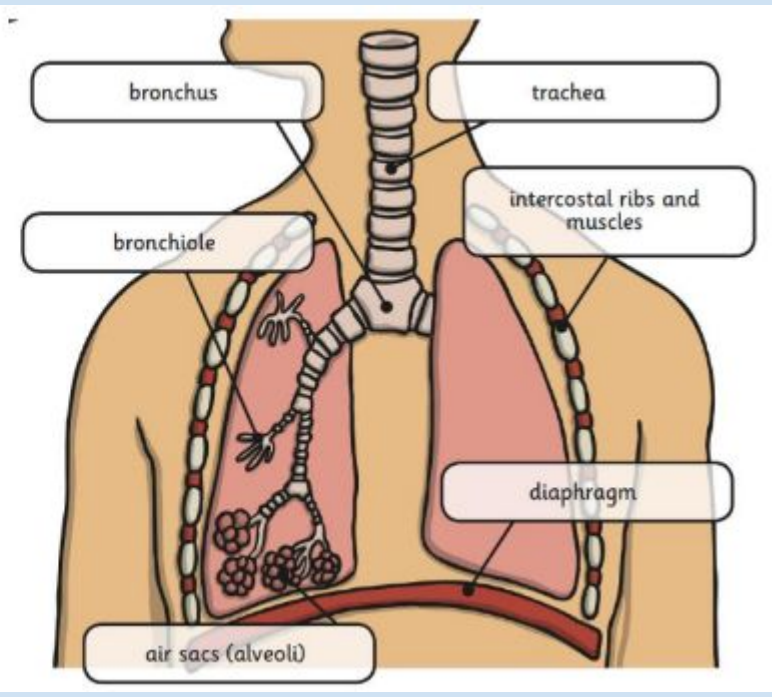
The Human Circulatory System:
The circulatory system is an essential part of our body. 'Circulatory' means something that is going on a continuous circuit. This is exactly what is happening in our bodies all the time.

The Main Parts of the Circulatory System:

Heart:
The heart plays an important role because it keeps all the blood flowing in the circulatory system. The process of exercising results in the body requiring more oxygen, this means that the heart has to circulate more oxygenated blood through the circulatory system. That is why your heart beats faster when you exercise.

Lungs:
When we breathe, we inhale air containing oxygen into our lungs. It is in the lungs that blood vessels pick up oxygen and leave carbon dioxide to be released.





Thinking Point
What other systems in the human body can you remember?

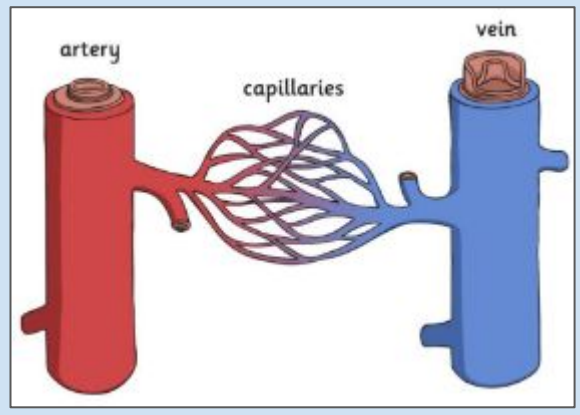
Explore and Investigate
Heart rate monitoring: Use stopwatches to record beats per minute - resting heart rate and after exercise.

Resources:
Heart model, stopwatches

Key Learning

Blood Vessels:
Blood vessels are tubes that carry the blood around the body. There are three main types of blood vessels:

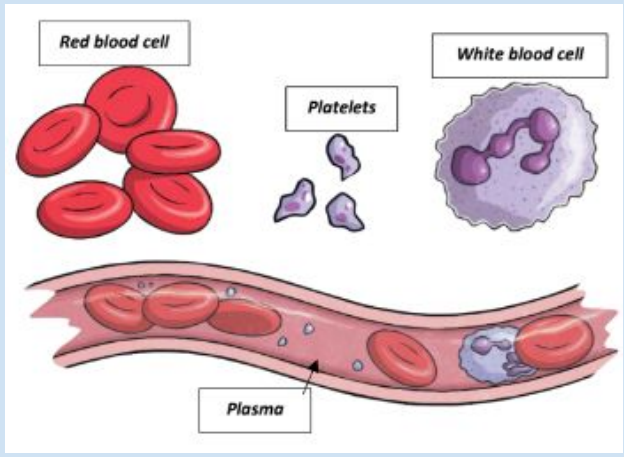
- Arteries – these carry oxygenated blood away from the heart to the rest of the body.
- Veins – these carry deoxygenated blood back to the heart to be pumped to the lungs to become oxygenated.
- Capillaries – these are blood vessels that connect to both arteries and veins. They are also connected directly to cells. Blood with nutrients and oxygen passes from the artery, through the capillary to a cell. Any waste is passed through capillary to the vein.



Blood:
Blood is a red substance made up of 4 parts:

- Plasma: the thick liquid which carries the blood cells through the vessels.
- Red blood cells: absorb the oxygen from the lungs and transport this to the different parts of your body.
- White blood cells: fight infections and illnesses which enter your body.
- Platelets: mend broken areas of flesh or skin by 'scabbing'.

The job of blood is to transport oxygen to all parts of the body, fight infection and mend broken flesh.

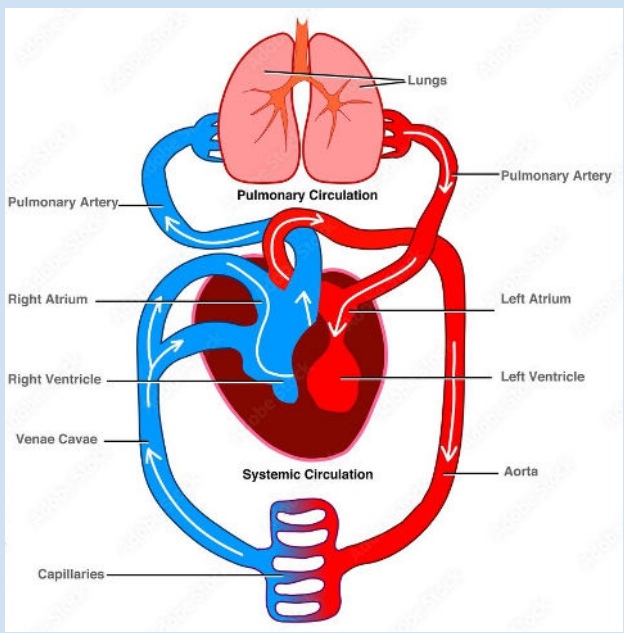


Thinking Point
Which blood cell do you think is the most important? Why?



How the Circulatory System Delivers Oxygen:

1. When we breathe in (inhale), air is sucked into the lungs.
2. The oxygen is absorbed into the blood here. Carbon dioxide in the blood is transferred back into the air, which then travels back out of the lungs.
3. The heart has two jobs: to pump oxygenated blood around the body; and to pump de-oxygenated blood to the lungs to collect oxygen.
4. Once oxygenated, the blood (from the lungs) returns to the heart. From here, it is pumped through the left atrium in to the left ventricle and then through the aorta (main artery), in to the arteries to be pumped around the body.
5. The blood travels through the arteries to smaller, thinner blood vessels called capillaries. When here, the oxygen and nutrients from the blood is able to travel through the thin walls of the capillaries into the cells of the tissue.
6. Once the oxygen has been delivered by the blood to the different areas of the body, the deoxygenated blood must return to the heart. From the heart, it is pumped through the right atrium and in to the right ventricle. The deoxygenated blood then travels to capillaries in the lungs where it absorbs fresh oxygen.
7. The process restarts and is continuous.



Thinking Point
Why do you think there are separate sides in the heart?



How the Circulatory System Delivers Nutrients and Water:
Remember what we learned about digestion in Year 4? Revise and re-read that Learning Journey Map!

1. After the food and liquids have been broken down in the mouth, oesophagus and stomach, they can then pass through to the small intestine. By this point, the food is in the form of chyme – a pulpy, acidic fluid made of stomach acid and small bits of food. It is here, in the small intestine, where the nutrients are absorbed into the bloodstream.
2. The small intestine is a muscular tube with several layers and lined with tiny hair like villi which are attached to arteries and veins. The chyme is moved back and forth in the small intestine. The nutrients pass through the villi and are absorbed into the blood vessels.
3. Water is absorbed in the small intestine in the exact same way as other nutrients are absorbed – through the villi into bloodstream via the blood vessels.
4. The nutrients and water, now in the bloodstream, travel around the body in the blood vessels and are absorbed by the cells which need them.



Thinking Point
Which part of the digestive system do you think is the most important?



Key Learning

The impact of lifestyle on the human body:

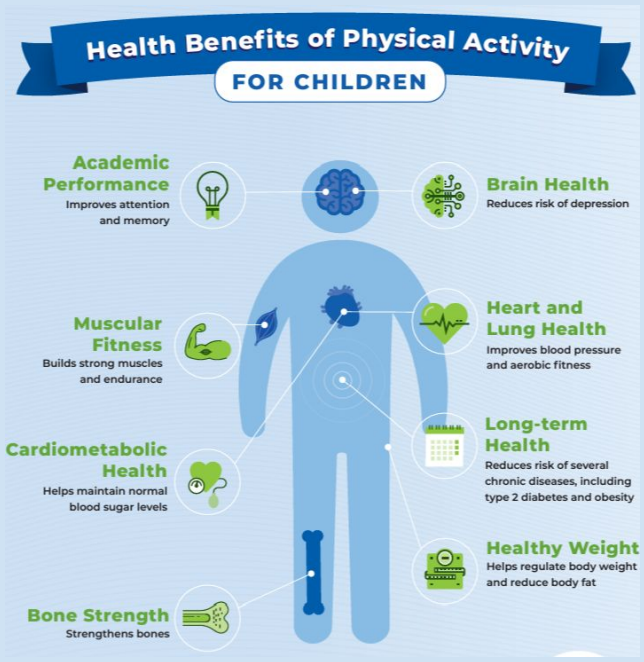
It's obvious, if you don't look after a car and don't put in the right petrol, it's not going to work properly. What many people do not realise is that our body is the same and what it becomes depends on how we choose to treat it. We need to think carefully about the areas of diet, exercise, drugs and lifestyle, as these are the things that can have an impact on your body.
Lifestyle means the way you live your life and this could be anything from your hobbies to what you enjoy doing as a family, understanding of portion sizes or what you tend to eat at mealtimes. People can forget that just a few simple changes to lifestyle can make changes to your body. Remember, a healthy lifestyle is about keeping a good balance!

Diet:
The word 'diet' simply means all the food and drink you choose to put into your body. The standard healthy diet for a person with no medical needs (such as diabetes) contains a balanced mix of different types of food and drink highlighted in the Eat-well Plate.



- Fruit and Vegetables: are good sources of vitamins and minerals and fibre. Aim to eat 5 portions a day! Choose from fresh, frozen, tinned, dried or juiced.
- Carbohydrates: are starchy foods such as potatoes, bread, rice, pasta and cereals should make up just over a third of the food you eat.
- These are important for giving us energy.
- Proteins: such as beans, pulses, fish, eggs, meat are very important for helping us grow and build muscles. Beans and pulses are a good
- alternative to meat as they contain less fat and are higher in fibre and protein.
- Dairy and Alternatives: are a source of calcium which is important for strong teeth and bones.
- Food and drinks high in Fat and/or Sugar: eat less often and in small amounts.

Exercise:
Exercise is physical activity that requires effort, raises your heart rate and works your muscles. Doing one hour of exercise per day has a huge positive effect on your body. Regular exercise results in better blood circulation, better stamina and fitness, stronger bones and a whole host of other benefits:



- Helps you fall asleep faster and deeper so you are better rested.
- Stimulates and releases brain chemicals – for example endorphins leave you feeling happier and serotonin helps keep your mood calm and leaves you feeling relaxed.
- Increases the amount of oxygen delivered to and carbon dioxide removed from the body.
- Bones increase in width and density (the denser the bone; the stronger it is).
- Strengthens all muscles.
- Increases the circulation of blood – this means that nutrients are delivered and waste taken away faster which improves parts of the body like skin.
- Increases the volume of blood and red blood cells.

The impact of drugs on the human body:
A drug is any substance that has an effect on your body when it enters your system. This effect can be good or bad. Drugs contain chemicals which can come from natural sources or are man-made. It is important that you follow the advice of doctors and responsible adults when taking a drug as even medicines have to be taken in a particular way to keep them safe.

Legal drugs include medicines like cough syrup and caffeine in substances like tea or coffee. These can be bought over the counter in shops. If used properly, these are not substances that are considered harmful or have serious side effects. However, they can also be substances, such as alcohol or the chemicals found in cigarettes, that have a very bad effect on your body. On top of this, they can also make someone's body want more of that drug and this is where someone can become addicted

Legal, harmful drugs:
• Alcohol is a legal drug but there are restrictions and recommended limits on its use because, drunk in excess, it can seriously damage health and can increase chances of high blood pressure, stomach cancer, liver damage or addiction.
• Tobacco smoking is a legal drug but there are restrictions and recommended limits on its use because it poses a serious threat to health. Excessive tobacco smoking can increase chances of lung cancer, heart disease, throat cancer, heart attacks and strokes.

Illegal drugs:
Unlike medicines, which are used to treat illness or disease, these drugs are taken by choice. They are illegal to buy, take or sell. These drugs are very harmful to the human body and are illegal because of the dangers associated with taking them. Some examples include:

- Cannabis
- Heroin
- Cocaine
- Ecstasy

Thinking Point
What advice would you give someone who was thinking about taking illegal drugs?



'Bringing Learning to Life: No Limits.No Barriers.'

