KS2: MEDIUM TERM PLANNER
Human Circulatory System Y6

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 body's function
- Describe the ways in which nutrients and water are transported within animals, including humans.

The principal focus of science teaching in upper key stage 2 is to enable pupils to develop a deeper understanding of a wide range of scientific ideas. They should do this through exploring and talking about their ideas; asking their own questions about scientific phenomena; and analysing functions, relationships, and interactions more systematically. At upper key stage 2, they should encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. They should also begin to recognise that scientific ideas change and develop over time. They should select the most appropriate ways to answer science questions using different types of scientific enquiry, including observing changes over different periods of time, noticing patterns, grouping, and classifying things, carrying out comparative and fair tests and finding things out using a wide range of secondary sources of information. Pupils should draw conclusions based on their data and observations, use evidence to justify their ideas, and use their scientific knowledge and understanding to explain their findings.

'Working and thinking scientifically' is described separately at the beginning of the programme of study but must always be taught through and clearly related to substantive science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content.

Pupils should read, spell, and pronounce scientific vocabulary correctly. During years 5 and 6, pupils should be taught to use the following practical scientific methods, processes, and skills through the teaching of the programme of study content:
planning different types of scientific enquiries to answer questions, including recognising, and controlling variables where necessary
taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar, and line graphs
using test results to make predictions to set up further comparative and fair tests reporting and presenting findings from enquiries, including conclusions, causal relationships, and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations identifying scientific evidence that has been used to support or refute ideas or arguments.

Prior Learning:	**Future Learning:**
• Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. (Y2 - Animals, including humans) • Identify that animal, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat. (Y3 - Animals, including humans) • Describe the simple functions of the basic parts of the digestive system in humans. (Y4 - Animals, including humans) • Identify the different types of teeth in humans and their simple functions. (Y4 - Animals, including humans)	• The consequences of imbalances in the diet, including obesity, starvation and deficiency diseases. (KS3) • The effects of recreational drugs (including substance misuse) on behaviour, health, and life processes. (KS3) • The structure and functions of the gas exchange system in humans, including adaptations to function. (KS3) • The mechanism of breathing to move air in and out of the lungs. (KS3) • The impact of exercise, asthma, and smoking on the human gas exchange system. (KS3)

Key Questions (*show how content and concepts link*) **Differentiated** Learning Objectives	**Teaching and learning activities** *(linked directly to objectives)*	**Resources** (*to help pupils reach the learning objectives)*	**Written and non -written outcomes** (*assessment including homework's)*
1) Why is blood important in the circulatory system? SCIENCE CAPITAL: *How does this lesson connect with children in my class? What happens when you get sick? How do you feel when you get a small cut?* Science Working scientifically Skills:  Science Enquiry Type **Research/ Asking question** *The heart pumps blood in the blood vessels around to the lungs. Oxygen goes into the blood and carbon dioxide is removed. The blood goes back*	**Science reasoning task: explorify: Have you ever had?** Had a blood test? - Explorify **Activity 1:** Introduction to what the circulatory system is made of- blood is one of the parts. Discuss the different parts of the blood, blood vessels and capillaries included. **Activity 2:** Look at different red and white blood cells and platelets microscope images. Pupils to describe the texture, size, colours seen. **Activity 3:** Create a blood model. Platelets, plasma, white blood cells and red blood cells represented with marshmallows, cheerio's, red/yellow food colouring. **Misconception:** Some children may think: • your heart is on the left side of your chest • the heart makes blood • the blood travels in one loop from the heart to the lungs and around the body • when we exercise, our heart beats faster to work the muscles more	**Activity 1:** PowerPoint **Activity 2:** Microscope pictures **Activity 3-** Instructions- marshmallows, food colouring, cherries, plastic bottle.	**Assessment:** Pupils able to ask questions. **Homework:** Create blood art.

to the heart and is then pumped around the body. Nutrients, water and oxygen are transported in the blood to the muscles and other parts of the body where they are needed. As they are used, they produce carbon dioxide and other waste products. Carbon dioxide is carried by the blood back to the heart and then the cycle starts again as it is transported back to the lungs to be removed from the body. This is the human circulatory system. Diet, exercise, drugs and lifestyle have an impact on the way our body's function. They can affect how well out heart and lungs work, how likely we are to suffer from conditions such as diabetes, how clearly, we think, and generally how fit and well we feel. Some conditions are caused by deficiencies in our diet e.g., lack of vitamins. This content is also included in PSHE. Physical health and mental wellbeing (Primary and secondary) - GOV.UK (www.gov.uk)	• some blood in our bodies is blue and some blood is red • we just eat food for energy • all fat is bad for you • all dairy is good for you • protein is good for you, so you can eat as much as you want • foods only contain fat if you can see it • all drugs are bad for you.		
2)What are the parts of the heart and how do they work?	**Science reasoning task: explorify: Zoom in and Zoom out** Pink and spongey - Explorify **Activity 1:** PowerPoint- share facts about the heart.	**Activity 1:** PowerPoint **Activity 2:** How does your heart work? - BBC Bitesize	**Assessment:** Pupils able to identify the different parts of the heart using scientific language and describing their functions.

SCIENCE CAPITAL: *How does this lesson connect with children in my class? What activity do you do that you can really feel the heart pumping?* Science Working scientifically Skills:  Science Enquiry Type **Research/ observation/ asking questions** *The heart pumps blood in the blood vessels around to the lungs. Oxygen goes into the blood and carbon dioxide is removed. The blood goes back to the heart and is then pumped around the body. Nutrients, water and oxygen are transported in the blood to the muscles and other parts of the body where they are needed. As they are used, they produce carbon dioxide and other waste products. Carbon dioxide is carried by the blood back to the heart and then the cycle starts again as it is transported back to the lungs to be removed from the body. This is the human circulatory system. Diet, exercise, drugs and lifestyle have an impact on the way our body's function. They can affect how well out	**Activity 2:** Write about the different parts of the heart and their function using fact sheet/ research. **Activity 3:** Heart dissection demonstration to identify the different parts. **Misconception:** Some children may think: • your heart is on the left side of your chest • the heart makes blood • the blood travels in one loop from the heart to the lungs and around the body • when we exercise, our heart beats faster to work the muscles more • some blood in our bodies is blue and some blood is red • we just eat food for energy • all fat is bad for you • all dairy is good for you • protein is good for you, so you can eat as much as you want • foods only contain fat if you can see it • all drugs are bad for you.	The heart and how it works - 2nd level Science - BBC Bitesize What does the heart do? - BBC Bitesize Transport of nutrients and water - BBC Bitesize **Activity 3:** Animal hearts and dissection tools for pupils.	**Homework:** create heart art-sketches- interesting facts.

heart and lungs work, how likely we are to suffer from conditions such as diabetes, how clearly, we think, and generally how fit and well we feel. Some conditions are caused by deficiencies in our diet e.g., lack of vitamins. This content is also included in PSHE. Physical health and mental wellbeing (Primary and secondary) - GOV.UK (www.gov.uk)			
3)How can we say fit and healthy? SCIENCE CAPITAL: *How does this lesson connect with children in my class? What do you do to keep fit and healthy?* Science Working scientifically Skills:  Science Enquiry Type **Comparative** *The heart pumps blood in the blood vessels around to the lungs. Oxygen goes into the blood and carbon dioxide is removed. The blood goes back to the heart and is then pumped around the body. Nutrients, water and*	**Science reasoning task: explorify: Odd one out** Get your blood pumping - Explorify **Activity 1:** PowerPoint- how can we stay healthy? Classify the different foods in to own chosen category. **Activity 2:** Plan an investigation regarding heart rate and exercise. **Activity 3:** Carry out and conclude and evaluate experiment. **Misconception:** Some children may think: • your heart is on the left side of your chest • the heart makes blood • the blood travels in one loop from the heart to the lungs and around the body • when we exercise, our heart beats faster to work the muscles more • some blood in our bodies is blue and some blood is red • we just eat food for energy • all fat is bad for you • all dairy is good for you • protein is good for you, so you can eat as much as you want • foods only contain fat if you can see it • all drugs are bad for you.	**Activity 1:** PowerPoint **Activity 2:** Post it note planning template. **Activity 3:** Concept cartoons to discuss and posit note planning template.	**Assessment:** Are pupils can use working scientifically skills. **Homework:** Diary of weeks exercise.

oxygen are transported in the blood to the muscles and other parts of the body where they are needed. As they are used, they produce carbon dioxide and other waste products. Carbon dioxide is carried by the blood back to the heart and then the cycle starts again as it is transported back to the lungs to be removed from the body. This is the human circulatory system. Diet, exercise, drugs and lifestyle have an impact on the way our body's function. They can affect how well out heart and lungs work, how likely we are to suffer from conditions such as diabetes, how clearly, we think, and generally how fit and well we feel. Some conditions are caused by deficiencies in our diet e.g., lack of vitamins. This content is also included in PSHE. Physical health and mental wellbeing (Primary and secondary) - GOV.UK (www.gov.uk)			
4)How do nutrients travel through the body?	**Science reasoning task: explorify: Have you ever?** Been told to eat more fruit and vegetables? - Explorify	**Activity 1:**	**Assessment:** Able to explain how nutrients travel through the body.

SCIENCE CAPITAL: *How does this lesson connect with children in my class? What do you eat to ensure you have a healthy diet?* Science Working scientifically Skills:  Science Enquiry Type *The heart pumps blood in the blood vessels around to the lungs. Oxygen goes into the blood and carbon dioxide is removed. The blood goes back to the heart and is then pumped around the body. Nutrients, water and oxygen are transported in the blood to the muscles and other parts of the body where they are needed. As they are used, they produce carbon dioxide and other waste products. Carbon dioxide is carried by the blood back to the heart and then the cycle starts again as it is transported back to the lungs to be removed from the body. This is the human circulatory system. Diet, exercise, drugs and lifestyle have an impact on*	**Activity 1:** PowerPoint to explain how nutrients travel through the body. **Activity 2:** Osmosis through demonstration in skittle experiment and jellybean. **Misconception:** Some children may think: • your heart is on the left side of your chest • the heart makes blood • the blood travels in one loop from the heart to the lungs and around the body • when we exercise, our heart beats faster to work the muscles more • some blood in our bodies is blue and some blood is red • we just eat food for energy • all fat is bad for you • all dairy is good for you • protein is good for you, so you can eat as much as you want • foods only contain fat if you can see it • all drugs are bad for you.	How are Nutrients Transported Around the Body - Bing video **Activity 2**: Jellybean / skittles and hot water. **Activity 3:** Completing activity to explain how nutrients travel through the body.	**Homework:** Osmosis experiment

the way our body's function. They can affect how well out heart and lungs work, how likely we are to suffer from conditions such as diabetes, how clearly, we think, and generally how fit and well we feel. Some conditions are caused by deficiencies in our diet e.g., lack of vitamins. This content is also included in PSHE. Physical health and mental wellbeing (Primary and secondary) - GOV.UK (www.gov.uk)			
5) **What is the impact of drugs and alcohol on human body?** SCIENCE CAPITAL: *How does this lesson connect with children in my class? Are all drugs bad?* Science Working scientifically Skills:  Science Enquiry Type **Research/ observation /Asking questions** *The heart pumps blood in the blood vessels around to the lungs. Oxygen goes into the blood and carbon dioxide is removed. The*	**Activity 1:** PowerPoint go through and discuss what are drugs? Are all drugs bad? What is the difference between legal and illegal drugs? Classify these. **Activity 2:** Discuss the effects of alcohol, drugs and poor diet on the human body. **Activity 3:** Identify the effects of alcohol, drugs and poor diet on the body and label a diagram. **Misconception:** Some children may think: • your heart is on the left side of your chest • the heart makes blood • the blood travels in one loop from the heart to the lungs and around the body • when we exercise, our heart beats faster to work the muscles more • some blood in our bodies is blue and some blood is red • we just eat food for energy	**Activity 1:** PowerPoint **Activity 2:** human body templates and statements for and against. **Activity 3:** human body diagram.	**Assessment:** Are pupils able to identify the effects of alcohol, drugs, and poor diet.

blood goes back to the heart and is then pumped around the body. Nutrients, water and oxygen are transported in the blood to the muscles and other parts of the body where they are needed. As they are used, they produce carbon dioxide and other waste products. Carbon dioxide is carried by the blood back to the heart and then the cycle starts again as it is transported back to the lungs to be removed from the body. This is the human circulatory system. Diet, exercise, drugs and lifestyle have an impact on the way our body's function. They can affect how well out heart and lungs work, how likely we are to suffer from conditions such as diabetes, how clearly, we think, and generally how fit and well we feel. Some conditions are caused by deficiencies in our diet e.g., lack of vitamins. This content is also included in PSHE. Physical health and mental wellbeing	• all fat is bad for you • all dairy is good for you • protein is good for you, so you can eat as much as you want • foods only contain fat if you can see it • all drugs are bad for you.		

(Primary and secondary) - GOV.UK (www.gov.uk)			
6) How does drug, diet and lifestyle impact the body? **7)What advice would you give a solider?** SCIENCE CAPITAL: *How does this lesson connect with children in my class? What do you do to look after your health?* Science Working scientifically Skills:  Science Enquiry Type **Research** *The heart pumps blood in the blood vessels around to the lungs. Oxygen goes into the blood and carbon dioxide is removed. The blood goes back to the heart and is then pumped around the body. Nutrients, water and oxygen are transported in the blood to the muscles and other parts of the body where they are needed. As they are used, they produce carbon dioxide and other waste products. Carbon dioxide is carried by the blood back to the heart and then the*	****Writing response** **Activity 1:** PowerPoint go through and recap. **Activity 2:** share soldiers' plea and discuss possible response ideas. **Activity 3:** create a letter of response- model and share ideas. **Misconception:** Some children may think: • your heart is on the left side of your chest • the heart makes blood • the blood travels in one loop from the heart to the lungs and around the body • when we exercise, our heart beats faster to work the muscles more • some blood in our bodies is blue and some blood is red • we just eat food for energy • all fat is bad for you • all dairy is good for you • protein is good for you, so you can eat as much as you want • foods only contain fat if you can see it • all drugs are bad for you.	**Activity 1:** PowerPoint go through, and recap effects of drugs etc. **Activity 2:** For and against statements. **Activity 3:** letter template	**Assessment:** Are pupils able to identify the effects of alcohol, drugs, and poor diet.

cycle starts again as it is transported back to the lungs to be removed from the body. This is the human circulatory system. Diet, exercise, drugs and lifestyle have an impact on the way our body's function. They can affect how well out heart and lungs work, how likely we are to suffer from conditions such as diabetes, how clearly, we think, and generally how fit and well we feel. Some conditions are caused by deficiencies in our diet e.g., lack of vitamins. This content is also included in PSHE. Physical health and mental wellbeing (Primary and secondary) - GOV.UK (www.gov.uk)			
8) Who was Marie Daly and why is she significant? SCIENCE CAPITAL: *How does this lesson connect with children in my class? What do you notice about this scientist through the pictures?* Science Working scientifically Skills: Science Enquiry Type	**Science reasoning task: explorify:** 'Super broccoli' food research scientist - Explorify **Activity 1:** PowerPoint – what does the picture tell us? What period was she from? What might she been part of or known for linked to this topic? Go through fact file about Mary Daly and her work. **Activity 2:** Research Marie Daly facts to use to create a biography. **Activity 3:** Use research to create a biography. **Misconception:**	**Activity 1:** PowerPoint go facts **Activity 2:** Marie Maynard Daly - Wikipedia All About Marie Maynard Daly KS2 PowerPoint (teacher made) (twinkl.co.uk) Marie Maynard Daly Facts for Kids (kiddle.co)	**Assessment:** Are pupils able to write a biography using key facts researched.

Research *The heart pumps blood in the blood vessels around to the lungs. Oxygen goes into the blood and carbon dioxide is removed. The blood goes back to the heart and is then pumped around the body. Nutrients, water and oxygen are transported in the blood to the muscles and other parts of the body where they are needed. As they are used, they produce carbon dioxide and other waste products. Carbon dioxide is carried by the blood back to the heart and then the cycle starts again as it is transported back to the lungs to be removed from the body. This is the human circulatory system. Diet, exercise, drugs and lifestyle have an impact on the way our body's function. They can affect how well out heart and lungs work, how likely we are to suffer from conditions such as diabetes, how clearly, we think, and generally how fit and well we feel. Some conditions are caused by deficiencies in our diet e.g., lack of vitamins. This content is also included in PSHE.* Physical health and mental wellbeing (Primary	Some children may think: • your heart is on the left side of your chest • the heart makes blood • the blood travels in one loop from the heart to the lungs and around the body • when we exercise, our heart beats faster to work the muscles more • some blood in our bodies is blue and some blood is red • we just eat food for energy • all fat is bad for you • all dairy is good for you • protein is good for you, so you can eat as much as you want • foods only contain fat if you can see it • all drugs are bad for you.	**Activity 3:** biography templates optional.	

and secondary) - GOV.UK (www.gov.uk)			