

Pioneer Federation
Medium term plan
UKS2- Cycle 1 Term 3
Science



Subject: Science	
Key Concept/ Theme:	
<ul style="list-style-type: none"> ● 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. To know the effects of diet and exercise, drugs and lifestyle on human bodies. 	
Prior Learning links:	
1	<ul style="list-style-type: none"> ● Identify and name a variety of common animals that are birds, fish, amphibians, reptiles and mammals ● Identify and name a variety of common animals that are carnivores, herbivores and omnivores. ● Describe and compare the structure of a variety of common animals (birds, fish, amphibians, reptiles and mammals, and including pets). ● Identify, name draw and label the basic parts of the human body and say which parts of the body is associated with each sense.
2	<ul style="list-style-type: none"> ● Notice that animals, including humans, have offspring which grow into adults ● Find out about and describe the basic needs of animals, including humans, for survival (water, food and air) ● Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.
3	<ul style="list-style-type: none"> ● Identify that animals, 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 ● Identify that humans and some animals have skeletons and muscles for support, protection and movement.
4	<ul style="list-style-type: none"> ● Describe the simple functions of the basic parts of the digestive system in humans ● Identify the different types of teeth in humans and their simple functions ● Construct and interpret a variety of food chains, identifying producers, predators and prey.

Pioneer Federation
Medium term plan
UKS2- Cycle 1 Term 3
Science

5

- Describe the changes as humans develop from birth to old age.

Vocabulary:

heart – a muscle that pumps blood around the body

lungs – spongy air filled organs that provide oxygen to the blood

blood – a liquid that carries oxygen, water and nutrients around the body

veins – carry deoxygenated blood to the heart

arteries – carry oxygenated blood away from the heart

heart rate – the number of times our heart beats per minute

1. **Prior learning reconnection (year group, cycle & term):** LKS2 – Children will have learnt about keeping healthy in Y3 and Y4. In Y4, they will also have learnt about the digestive system which briefly introduces how nutrients are absorbed into the body

Cycle 2, LKS1, Term 6

LO: To be able to identify and name the main parts of the human circulatory system, and explain the functions of the heart, blood vessels and blood.

Hook – The Fitness Club!

This entire unit of work could be set within the context of a fitness centre. Through all their enquiries the children will be developing their knowledge of the human body. At the end of the term you could set up mini information stations. Other children could be invited to the ‘fitness club’ to find out more about how to look after themselves. This will include information on diet, drugs, exercise, lifestyle, the importance of water, and the affects that exercise has on our hearts.

Explore - What is the function of the heart?

Allow the children to place their hand over their chests. Ask them what they can feel. The children can do this again after jogging on the spot for 30 seconds. Ask them to discuss what is happening.

Video – The circulatory system

There are plenty of good video animations describing the circulatory system.

<http://www.youtube.com/watch?v=NF68qhyfcoM>

Modelling the heart and circulatory system

An analogy

Get the children to place a closed fist on the table. Ask them to count how many times they can open and close this fist in just one minute. Ask the children to explain why this action is like that of the heart.

Modelling - Make a heart – a model of one of the chambers

1. Fill a jar half full of water.
2. Cut the neck of the balloon off at the part where it starts to widen into a balloon.
3. Stretch the balloon over the opening of the jar, pulling it down as tightly as you can.

Pioneer Federation
Medium term plan
UKS2- Cycle 1 Term 3
Science

4. Carefully use the tip of a skewer to poke two holes in the surface of the balloon. Make them about 2 centimetres apart from each other and near opposite edges of the jar.
5. Stick the long part of a straw into each hole. The straws should fit securely in the holes so no air can get through around the straws.
6. Slide the uncut end of the balloon neck onto one of the straws and tape it around the straw.
7. Set your pump in a washing up bowl to catch the pumped water. Bend the straws downward. Gently press in the centre of the stretched balloon and watch what happens to the water in the jar.



This is a simple pump that moves water from the jar through the straws and into the washing up bowl. The cut end of the balloon worked as a valve to stop the water from going back down the straw. Your heart pumps blood out into your body through your arteries in a similar way.

Human hearts have four separate chambers inside. This pump shows how one chamber and its valve works. A valve is used to keep blood that has been pumped from one chamber to another from flowing back into the chamber it came from. Try taking the balloon valve off of the straw and pump water again. You likely saw that water still came out of the straw, but without the valve, there was nothing to keep some water from going back down the straw. In order to keep blood moving through your heart and into your body, your heart needs valves to separate its chambers

Recording

The children could draw a human heart and use labels to explain its function.

2.

Reconnection: What does the word chamber mean?

LO: To be able to identify and name the main parts of the human circulatory system, and explain the functions of the heart, blood vessels and blood.

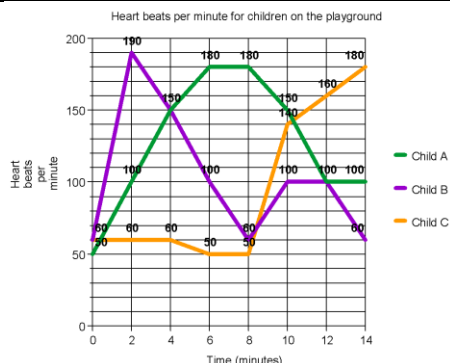
Skills: Record results

Comparative test – What happens to the rate at which our hearts beat when we perform different exercises?

Hook – Begin with evidence

Show the children the line graph below. Ask them to try and explain what they think each of the children might have been doing during the playtime.

Pioneer Federation
Medium term plan
UKS2- Cycle 1 Term 3
Science



Observation – How many times does your heart beat every minute?

Using a home-made stethoscope (a cardboard tube), the children can listen to each other's hearts. Count how many heart beats there are in 30 seconds. Double this to find out how many beats per minute.

Pattern-seeking – Is there a relationship between the type of exercise that you do and the number of heart beats per minute?

The children must plan their own investigation. They can decide upon the types of exercise that they will do, how they will measure the number of beats, and they will record their results. However, this is a great opportunity for the children to record using a line graph

They could use heart monitors/pulse meters to measure their pulses.

Recording – An explanation

Help the children to develop a good explanation. First, allow them to actively communicate what they think the heart was doing during the different exercises, and why it was doing this. They could do through drama, discussion on talking about a sketch that they have made. Then, ask the children to identify some key science words that will help them to explain what happened. Finally, ask the children to explain what happened, referring back to their results.

3

Reconnection: What is a comparative test?

LO: To be able to identify and name the main parts of the human circulatory system, and explain the functions of the heart, blood vessels and blood.

Researching using secondary sources – What are the functions of blood?

http://www.e-learningforkids.org/Courses/Liquid_Animation/Body_Parts/Blood/

This website animation will introduce the children to the functions of blood: carry oxygen, food and chemical messages around the body, and defend against infection.

Other animated videos can be found on the internet:

<http://www.youtube.com/watch?v=R-sKZWqsUpw>

Modelling the components of blood - Make your own 'blood'

Provide the children with the following information about the components of blood. They can then create their own models of the blood, carefully trying to get the correct proportions.

Pioneer Federation
Medium term plan
UKS2- Cycle 1 Term 3
Science

1. Red blood cells (red-coloured sweets): 44% of blood volume. Carry oxygen and carbon dioxide around body. Only live for about 3 months, but are continuously produced in the bone marrow.
2. Plasma (syrup): 55% of blood volume. Syrups, thick, clear, yellowish liquid that carries dissolved food and wastes.
3. White blood cells (white jelly beans or marshmallows): 0.5% of blood volume. Bigger than red blood cells, oddly shaped cells that "eat" bits of old blood cells and attack germs.
4. Platelets (smarties): 0.5% -bits of cells and cytoplasm that help clot your blood.

Interesting Fact: There are 5 million red blood cells, 10 thousand white blood cells, and 250 thousand platelets in a pinhead-size drop of blood.

Recording

The children can draw blood with all its different components. They can label the components and explain the function of each one.

Optional: Teacher modeling the function of platelets

Health and safety - This will need to be demonstrated by the teacher as it involves boiling water.

1. Heat about 120ml of water until it is boiling.
2. Add 1/2 teaspoon of gelatin
3. Keep stirring until it dissolves – it does tend to stick to the pan.
4. Take off the heat and leave to cool for 15 minutes
5. Add a few drop of red food dye until you get the colouring you would like. These 5 steps will be carried out by the teacher
6. Over the next course of hour it will thicken showing how blood coagulates and sticks together. If your pour it into a clear glass you will see that happen easily.
7. If you take some of the sticky blood out and smear it on grease proof paper, it will set hard like a scab does!

Pioneer Federation
Medium term plan
UKS2- Cycle 1 Term 3
Science

4	<p>Reconnection: What is blood made up of? LO: To be able to describe the ways in which nutrients and water are transported within animals, including humans.</p> <p>Activity:</p> <p>Research – Why do we need to drink water?</p> <p>Provide children with the resources so that they can find out about the roles that water play in keeping us alive; especially in transporting blood and nutrients around the body.</p> <p>http://www.cyh.com/HealthTopics/HealthTopicDetailsKids.aspx?p=335&np=284&id=1494</p> <p>http://www.nhs.uk/Livewell/Goodfood/Pages/water-drinks.aspx</p> <p>Recording</p> <p>The children could design a poster to explain why we need water.</p>
5	<p>Reconnection: LO: To be able to recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. Skills: representing results</p> <p>Challenge the children to create their own wellbeing clinic for Upper Key Stage 2 children. In this clinic they will need to be able to provide advice as to how to live a healthy life. This should include information on exercise, lifestyle and drugs.</p> <p>Researching drugs.</p> <p>Provide the children with pictures of different drugs and information as to the effects that these have on the human body. They must use this information to create a form of presentation that children of a similar age would understand.</p> <p>Researching exercise.</p> <p>The following short video will introduce to children the idea that there are a range of activities that add to our well being. http://www.nhs.uk/video/pages/sebcoe.aspx</p> <p>The following site provide children with information on what different forms of exercise can do for the human body and how people can get started with them http://www.nhs.uk/LiveWell/getting-started-guides/Pages/getting-started-guides.aspx</p> <p>Researching diets</p> <p>Children could use secondary sources to gather information about what makes a healthy diet. 'Showdown at the food pyramid' by Rex Barron is one of many books that children could use in their research</p>
	<p>Quiz/assessment</p>

Pioneer Federation
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UKS2- Cycle 1 Term 3
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Science End of Term Quiz UKS2 - Term 3

1. Can you draw ways you can follow a healthy lifestyle?

2. Some children are learning about blood and how it flows around the human body. Blood flows faster when the heart pumps faster. Which TWO of the following make the heart pump fastest?

- running skipping
 sleeping sitting

3. Children's hearts beat faster as they run around the playground. Explain why this happens when they run.

4. What is the heart made from?

5. What is the difference between a vein and an artery?

End points:

- To know the three parts of the circulatory system.
- To know the names of parts of the heart and describe how it works.
- To describe the differences between arteries, capillaries and veins.
- To know the different parts of blood and their job in the body.
- To explain why blood is oxygenated and deoxygenated.
- To know the benefits of a healthy lifestyle on the body.
- To know explain how drugs and alcohol have an effect on the body.
- To explain how nutrients and water are carried around the body and why this is important for the body.

Future learning links:

Pioneer Federation
Medium term plan
UKS2- Cycle 1 Term 3
Science

- KS3 – Children will learn more about the importance of a healthy diet and how foods are absorbed and used in the human body. They will learn more about gas exchange systems in the lungs of the human body. They will also look at the effects of recreational drugs including substance misuse.