Y6 Autumn 1 Animals including Humans - Science Plan

Unit Rationale

Building on their knowledge from year 2 , 3, 4 and 5 the students will learn in greater depth 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 bodies 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. The new statutory requirements for relationships and health education can be found below:

• statutory guidance on Physical health and mental wellbeing (primary and secondary).

Common misconceptions:

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.

National Curriculum Objectives/ substantive:

• 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.

Cross Curricular Links:

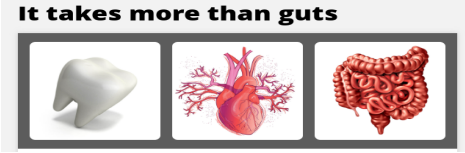
PSHE

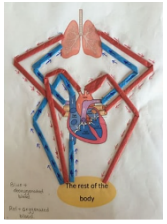
Trips/Visits:

Modern Day Links:

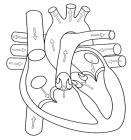
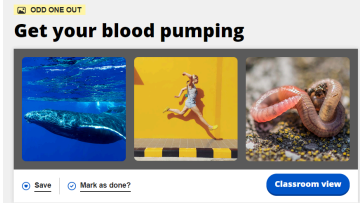
Nutritionist Human body - Science Museum	Health in Awra Amba - Lyfta
Prior Learning:	**Vocabulary:**
• Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. (Y2 - Animals, including humans) • Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat. (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)	Heart, pulse, rate, pumps, blood, blood vessels, transported, lungs, oxygen, carbon dioxide, nutrients, water, muscles, cycle, circulatory system, diet, exercise, drugs, lifestyle
Big ideas/Disciplinary Knowledge	**What next?**
Enquiry Skills including: Sc6/1.1 planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary Sc6/1.2 taking measurements, using a range of scientific equipment, with increasing accuracy and precision Sc6/1.3 recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, and bar and line graphs	• 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)

Sc6/1.4 using test results to make predictions to set up further comparative and fair tests Sc6/1.5 using simple models to describe scientific ideas Sc6/1.6 reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of results, in oral and written forms such as displays and other presentations Sc6/1.7 identifying scientific evidence that has been used to support or refute ideas or arguments.	

Lesson	WALT	What should the children remember?	Lesson plan and outcome	Key Vocabulary	Key Questions
Lesson 1	WALT: identify the purpose of the 3 systems of the human body. **Scientific Enquiry** Research using secondary sources.	Describe the importance for humans of exercise. (Y2) Identify that animals, including humans get nutrition from what they eat. (Y3) Describe the simple functions of the basic parts of the digestive system in humans. (Y4) Identify the different types of teeth in humans and their simple functions humans (Y4)	Recap lesson – children will be learning about the circulatory system this unit -so recapping previous systems taught in Y3/4 **Organisation -** (SLIDE 2) Children will need to stick in their KO **Introduction/ Oracy - linguistic focus** (SLIDE 6) Odd one out  https://explorify.uk/en/activities/odd-one-out/it-takes-more-than-guts (Children will return to this odd one out at the end of lesson 4) **Main part** (SLIDE 7 -) Match the definition of the skeletal, digestive and circulatory systems - How do we survive? – what systems in our body do we need to survive? **Oracy – Use Oracy trios Purpose: generate ideas and opinions.** Use the following link to look at the skeletal, digestive and circulatory system Siemens Healthcare Interactive (thehumanbodygame.co.uk) What is the purpose of these systems – how do they help us survive? This could be done as a whole class or using chromebooks . **Outcome** (SLIDE 10) Children to record the systems, their function, organs of this system –	Systems Digestion Skeleton circulatory	1 - What are the 5 food groups? 2 – Name one type of teeth we have? 3 - True or False? When we exercise, our heart beats faster to work the muscles more

			Return to Odd one out (Slide 11)to record that the heart is the odd one out as the other 2 are part of eating/digesting **Quiz** (SLIDE 12) **Adaptation** -All children should be able to label the systems, their functions and organs which form part of it. -Some should be able to identify the system and their function -Some children could research other systems within the body		
Lesson 2	**WALT: explain how the circulatory system works** **Scientific Enquiry** Research using secondary sources. **Skills focus**	Describe the importance for humans of exercise. (Y2) Identify that animals, including humans get nutrition from what they eat. (Y3) Describe the simple functions of the basic parts of the digestive system in humans. (Y4) Identify the different types of teeth in humans and their simple functions humans (Y4)	**Organisation -** children will need paper to draw their heart diagram (cold task) **Retrieval** (SLIDE 2) quick quiz **Introduction** (SLIDE) (cold task) Children draw a diagram of how they believe the heart works as their 'cold' task. Leave space around the drawing as they will use this space to come back and edit and add information as they move through the unit **Main part** (SLIDE 6) Compare their drawings to the following websites Siemens Healthcare Interactive (thehumanbodygame.co.uk) https://www.youtube.com/watch?v=f9ONXd_-anM **Outcome** (SLIDE 7) Children to recreate the circulatory system using red and blue straws/pipe cleaners (or just pens) to show the journey of oxygenated and deoxygenated blood around the system. **Ensure they include arrows to show the direction of blood travel**  **Possible drama idea to demonstrate** A good way to teach the circulatory system that appeals to all those kinaesthetic learners! Set the room out with six tables labelled lungs, heart, brain, legs, arms, stomach. Sit two volunteers at each table, with four at the heart, two on each side. The rest of the class are given pieces of card -	Heart, blood, Vessels, oxygenated, deoxygentated	

			red on one side, blue on the other, representing oxygen-rich and deoxygenated blood. Send one child off first, circulating the body. Start from one side of the heart, choose a part of the body (e.g. legs) to go to, taking red blood. At the legs table, give to one person at the table, who turns the card over, passes it to the other person, who then returns the deoxygenated blood to the carrier. That person then returns to the other side of the heart where the blood card is passed through the two volunteers and back to the carrier, who is directed to the lungs. At the lungs table, the lung volunteers turn the card over, so it becomes once again oxygen-rich. They then send the carrier back to the heart where the cycle begins again and they are directed to another part of the body. Once the path is clear, gradually add in more carriers until you have the complete blood cycle going round the classroom. At intervals, ask for everyone to freeze and question individuals about what type of blood they are carrying, where it is coming from and where they are going to. This activity can be followed by colouring in and labelling a diagram to demonstrate understanding.) **Quiz** (SLIDE 8) **Adaptation** -All children should be able to create a model of the circulatory system -Some could need support in ensuring the colours and arrows are correct -Some children can draw the heart, lungs and label the names of some vessels		
Lesson 3	**WALT: describe the bloods journey through the heart**	Describe the importance for humans of exercise. (Y2) Identify that	**Organisation:** Children will need paper to draw their heart diagram (cold task) **Retrieval (slide 2 - 5)** **Introduction (slide 7)** (cold task) Children draw a diagram of what they think the heart looks like – they can add labels	Ventricle atrium aorta veins arteries blood vessels valves	What are the four chambers of the heart called? How is blood prevented from

	<u>Working scientifically</u> Research and secondary sources. Skill: Using and understanding scientific diagrams.	animals, including humans get nutrition from what they eat. (Y3) Describe the simple functions of the basic parts of the digestive system in humans. (Y4) Identify the different types of teeth in humans and their simple functions humans (Y4)	and write sentences about what they think happens. **Main part (slide 8 - 9)** Listen to a heart beat from an adults and that of a baby – what is the difference. https://explorify.uk/en/activities/listen-what-can-you-hear/skip-a-beat Look at a video which shows the parts of a heart. https://www.youtube.com/watch?v=rnIUFrx0DjI If possible children could look at a real heart – many butchers will supply these if asked. **Outcome** (slide Children to draw a diagram of the heart labelling the four chambers, the aorta and the direction of the blood travel, ensuring that deoxygenated and oxygenated blood are indicated tool.  **Quiz (Slide** What do you think is the odd one out? Why? Discuss the difference in the circulatory system between mammals and invertebrates Get your blood pumping - Explorify  Complete quiz questions **Adaptation** -All children should be to label the heart and show oxygenated blood and deoxygenated blood -Some could need support in ensuring the colours and arrows are correct -Some children can draw the heart and label – they could also investigate different circulatory systems in the animal kingdom		falling into the next chamber? What is the difference between the circulatory system of a worm? **Big Question. What are the digestive systems of other animals like?**

Lesson 4	WALT: describe how nutrients and water are transported in the blood? **Working scientifically** Research and secondary sources. **Resources:** Plasma – yellowy liquid such as weak orange squash (one cup per soup); red blood cells- lots of small red jelly sweets or chopped up pieces of a raspberry jelly cube; white blood cells – a few small white marshmallows; platelets - small amounts of white rice; one sealable plastic bag per person or group making blood soup,		**Organisation – see resources for items needed. – they will need chromebooks** **Retrieval – (Slide 2-3)** **Introduction (Slide 5)**  Red doughnuts - Explorify What is this a picture of? Hook question: Is blood always red? Why do people give blood? Show a photo of Mrs Tyler's bag of blood **Main Part (Slide 6-7)** Ask children to look at the diagrams of the circulatory system that they made in Lesson 1. What does blood do in this body system? Establish that blood transports oxygen, nutrients and water around the body, and that it is pumped by the heart and carried in veins and arteries. Remind children that they learned about how oxygen and waste gases are transported in the blood in Lesson 3. Now they are going to learn about how blood also carries nutrients and water, and clots to stop bleeding. Watch videos. https://www.bbc.co.uk/bitesize/topics/z7x78xs/articles/zqv4cwx https://www.youtube.com/watch?v=qrE6Y0Se8bw Look at four ingredients of blood and their function Blood transports materials around the body and protects against disease. It contains:	blood, platelets, nutrients, digestive tract, white blood cells, red blood cells, plasma	What are the four components of blood? What is the function of white blood cells? What part of the blood transports nutrients?

			• **Red blood cells** which transport oxygen. • **White blood cells** which protect against disease. • **Blood platelets** which help the blood to clot and repair a cut. • **Plasma** which is a liquid that carries these cells. It also transports important nutrients **Outcome – (Slide 8)** Explain to children that they are going to make some 'blood soup' (model blood) using different ingredients to represent the four main parts of blood. Show the first section of the video again and ask children to list the four main parts. Have they listed red blood cells, white blood cells, plasma and platelets? Explain to children that they have to 'earn' each of the four ingredients to make their blood soup by completing a section of a blood fact file and then visiting their own 'blood bank'. Children compile a fact file about the four parts of blood and make blood soup Children use secondary sources of information (www.blood.co.uk) to find out the function of each of the four parts of blood and complete Blood facts: As they complete each section, children visit the 'blood bank' to claim the appropriate 'ingredient' to make their blood soup. Help the children to work out how much they need of each ingredient based on their fact file research. **Quiz (Slide 9)** **Adaptation** All children should be able to access this learning – work in mixed ability groups;		
Lesson 5	WALT: Recognise the impact of exercise on the way their bodies function.	Describe the importance for humans of exercise. (Y2) Identify that animals, including humans get nutrition from what they eat. (Y3)	**Retrieval (Slide 2-3)** **Introduction (Slide 5-6)** What happens to our bodies when we exercise?  Children discuss in pairs. Get some feedback and brainstorm on a flip chart. - children write down their ideas under the picture. See concept cartoon too and discuss	Line Graph, Axis, BBM BPM pulse Heart rate Interpret Increase decrease	What is in blood?

		Describe the simple functions of the basic parts of the digestive system in humans. (Y4) Identify the different types of teeth in humans and their simple functions humans (Y4)	**Main part (Slide 7 - 12)** | Activity	Prediction	BBM
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Before		
star jumps		
jogging		
5 mins After			 As a class we are going to observe what happens. Children and teacher now do exercise. The teacher keeps a record of their pulse rate. Children can have a go at trying to count theirs. 1 min seconds of star jumps. 1 min seconds jogging Count heart rate. Set a timer for 5 minutes and count again. Write it up for the children to see. Discuss how your heart rate goes up. Discuss why? (As soon as we begin to exercise our bodies respond. Our muscles are working more so they need more blood flowing to them and so our heart must pump more quickly. Consequently, our heart rate increases. As we continue to exercise, or our activity levels increase, we need more oxygen for respiration (this is the process by which our cells obtain energy from sugars) so that our muscles can continue to work. https://www.youtube.com/watch?v=gSfjSn17__I Observe and discuss the other effects of exercise: ● We breath quicker ● We get hotter ● We become more alert ● We sweat (We breathe more air into our lungs by breathing more deeply and rapidly. Sustaining exercise raises our body temperature too and we sweat to prevent overheating. The more vigorous our exercise,		

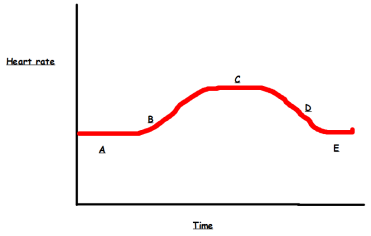
the more energy we need but also the more quickly we will experience fatigue. Increased blood flow to the brain means we become alert)

What are the long term benefits? Are there any negatives?

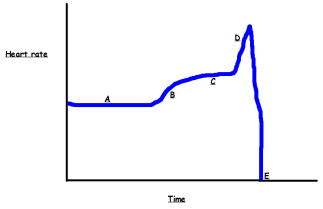
Benefits of exercise	Over exercise Can:
Reduces anxiety weight loss better sleep better digestion Improves your mood Lower risk of heart disease. stronger bones	Cause body strain and injuries fatigue

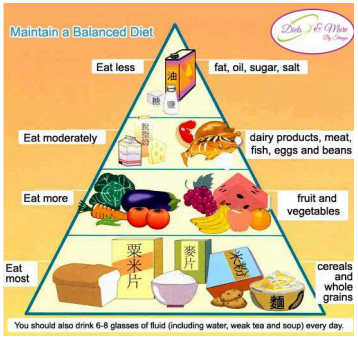
Add observations to the flip chart in a different colour pen

Give the children a copy of this graph. What could this graph show? What is happening at A, B, C, D and E?



In pairs discuss what the graph might show. Get

			feedback as a class. How would this graph look different if it showed the heart rate of an athlete? Can we put their heart rate on it? Why else might cause your heart rate increase/decrease? Excitement, fear. Calm, relaxed, sleep. Different graph scenarios. Children have a go at explaining the story of the graphs. They can then have ago at creating their own story  A. Laying on the beach B. Starting to Swim C. Swimming D. Shark attack E. Eaten. **Outcome (Slide 13)** Children to explain the positive and potential negatives of exercise. Write an explanation as to what is happening in the following the line graphs to change the heart rate. **Quiz (Slide 14)** **Adaptation** GD: Challenge Draw a line graph to show the heart rate of an athlete before, during and after exercise SEND: Work as a group with a teacher drawing a graph for a scenario. Provide widgets with scenarios to match with the points on the line graph.		
Lesson 6	WALT: Recognise the impact of diet and drugs on the way their bodies function.		**Retrieval (Slide 2-3)** **Introduction - (slide 4)** what do you think the difference between a healthy and unhealthy circulatory system would be like? **Big Question -** (Slide 5)Let the children 	Drugs Illegal Legal Caffeine Nicotine Alcohol	**What if we only drank cola?** **What does water do for**

	Question: How can I stay Healthy? Enquiry type Research and secondary sources classifying and grouping. Skill Focus Using scientific language.		discuss their ideas. They then spider diagram their own big question (They will come back later in Purple pen to add new learning.) Teacher records ideas on a flip chart sheet - look at examples on next slide (Slide 5) **Main part:** What do we need to do to keep our body and heart healthy? What should we not do? Write a list of 3 dos and dont's. Elicit that we need to eat a 'balanced diet.' and this includes water. Look at food pyramid - what does this mean? Ask the children what their food intake was like yesterday - did they eat from each group? What does each group give us?  Vegetables and fruit (fibre -good for digestion, Vitamins and minerals - healthy skin and hair + immune system) Carbohydrates (For energy) Proteins (for growth and repair) Fats (energy, help absorb vitamins, used in making new cells) Some can go in more than one group - e.g.meats (fats, protein) a banana (carbohydrate, vitamins and fibre) What about water? - Water - why do we need water? What would happen if we drank too much? If we have too much our kidneys would not be able to get rid of the excess water quick enough and the sodium levels drop. - look at diagram to illustrate the effects of water drinking. What else can affect your body? Look at slides explaining impact of smoking, drugs and alcohol on the body. **Outcome - (slide 15)** children to complete table using given word bank to explain impact of alcohol and drugs on the body (page 3 and 4 of resource sheet) **Quiz - (Slide 16) h**ave a debate - there are different limits of drinking age across the world - what do you think? **Adaptation** SEN support the complete of the table or provide resource from pg 1	Cancers Cirrhosis Exercise Addiction Balanced Diet diet, food, exercise, healthy lifestyle, impact, nutrients, water, oxygen, carbohydrates, fats, proteins, minerals, essential, healthy, vitamins, regular, calories, balanced	**us?**

			GD - draw diagrams to show the effect of the heart, arteries and lungs		