Subject: **Science - Biology**			
Year group: 6		Unit of Learning: **Living things and their habitat – Classification**	
Prior Learning: Children should be able name animals that are carnivores, herbivores and omnivores (Y1) and describe how animals obtain their food from plants and other animals, using the idea of a simple food chain. In Year 4 they use classification keys to identify and sort animals. They learned how to identify vertebrates and invertebrates – mammals, birds, fish, amphibians and reptiles		**Future Learning** Differences between species. (KS3) the role of leaf stomata in gas exchange in plants. (KS3) reproduction in plants, including flower structure, wind and insect pollination, fertilisation, seed and fruit formation and dispersal, including quantitative investigation of some dispersal mechanisms. (KS3) Photosynthesis(KS3)	
Theme	Learning Objective	Substantive Knowledge	Suggested Activity
Session 1 (1 – 1.5 hr)	**What are common observable characteristics?** **What is classification?** To describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals.	To know **classification** is putting things into groups. To know that **living things** can be divided into these groups or **'classified'** by looking at **similarities** and **differences** in the way they **look (observable characteristic)** and **behave**.	Provide children with a selection of 'Allsorts' or 'Dolly Mixture' List the observable characteristics (shape / pattern /size) Challenge pupils to sort them according to their characteristics. Explain that Scientist Carl Linnaeus created a classification system https://www.bbc.co.uk/teach/class-clips-video/science-ks2-the-work-of-carl-linnaeus/zhnjf4j

Session 2 (1 – 1.5 hr)	**What are the three main groups living things can be classified into?** **What are the two main groups animals can be classified into?** **What are the groups within the broader classification of vertebrates and invertebrates?** To describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals.	To know **classification** is putting things into groups. To know that **living things** can be divided into these groups or **'classified'** by looking at **similarities** and **differences** in the way they **look** and **behave**. To know that the three main groups of **living things** are **microorganisms, plants** and **animals**. To know that the two main groups of **animals** are **vertebrates** and **invertebrates**. To know that the groups of **vertebrates** and **invertebrates** can be broken down further in to smaller sub-groups.	Explain that all living things can be split into 3 board groups Microorganisms, Plants and animals https://www.youtube.com/watch?v=YSitT0oOoyc –intro to microorganisms Explain that the broad groups can be broken down into smaller sub- groups bacteria, viruses, fungi and algae are all examples of microorganisms Plants can be grouped according to where they are 'flowering' or 'non flowering' 'deciduous' or 'evergreen' Animals can be grouped in many different ways **Discovery** Use small world animal figures from science resources. Children work as a group to classify them in different ways. **How could you group these living things?** Children work together to group the animals however they see fit. Wings / No wings, by colour, fur no fur, number of legs, carnivore, herbivore, omnivore. Discuss the different ways children have chosen to group the animals and allow them to look at other groups work. https://www.bbc.co.uk/bitesize/topics/z6wwxnb/articles/zyq9r2p Now ask pupils to sort their animals into vertebrates and invertebrates Recap the main animal groups and the common characteristics Birds Mammals Invertebrates (including insects) Fish Amphibians Reptiles

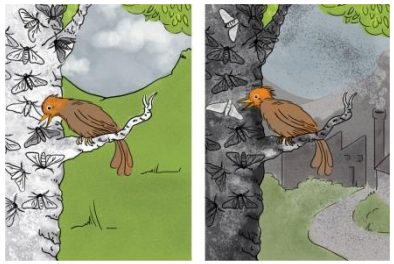
<table>
<tr>
<td></td>
<td></td>
<td></td>
<td>Pupils use posters to reclassify the animals into the above groups

Using some premade criteria challenge pupils to sort their animals using Venn and Carroll diagrams</td>
</tr>
<tr>
<td>Session 3
1 hour</td>
<td>What are the reasons for classifying animals?
To give reasons for classifying plants and animals based on specific characteristics.</td>
<td><u>To know that animals must be classified based on specific characteristics.</u></td>
<td>Pupils could use or develop their own classification key in order to sort animals into mammals /not mammals or use established ones.
After using pupils explain why an animal is classified that way. E.g. that a cow is a mammal because it has four legs breathes oxygen, gives birth to live young.
<table>
<tr>
<td>birds have
• wings
• a beak
• two legs
• lungs to breath
birds are warm blooded and their babies hatch out of the eggs they lay.</td>
<td>reptiles have
• 4 legs or no legs
• scales
• lungs to breath
reptiles are cold blooded and their babies hatch out of the eggs they lay.</td>
<td>fish have
• scales
• a beak
• no legs
• gills to breath
fish are cold blooded and their babies hatch out of the eggs they lay.</td>
</tr>
<tr>
<td>amphibians have
• skin
• for some of their life they have gills but they develop lungs as the get older.
amphibians are cold-blooded and their babies hatch out of the eggs they lay.</td>
<td>mammals have
• skin with some hair or fur
• a beak
• 4 legs (limbs)
• warm blooded
• give birth to live young</td>
<td>Invertebrate (insects, spiders, worms, slugs, water creatures such as jellyfish)</td>
</tr>
</table>
Pupils answer questions like?
Which 2 of these animals would be classified in the same group?
Would a penguin and an owl be classified in the same group?</td>
</tr>
</table>

Session 4 1 hour	**What are the main groups plants can be classified into? Are flowering or non-flowering plants more common in our school environment?** To describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals.	To know that **plants** can be classified into **flowering plants** and **non-flowering plants.** To know that **plants** can also be **classified** into the groups '**with seeds**' and '**without seeds**'	Introduce and explain the differences between flowering and non-flowering plants. Plants with seeds plants without seeds  https://www.youtube.com/watch?v=cgVlrtGnG6s I predict there will be more examples of flowering plant in the school environment than non-flowering plants? Do pupils agree or disagree? What do they predict? How could they find out / record the data? How would they be able to tell the difference between a flowering and a non-flowering plant. What if it is just not flowering at that time? Pupils investigate the school environment, possibly using classification keys, recording data using tally charts and bar chart.
			Scientific enquiry: That a key can be used to sort animals using their characteristics. How keys are constructed. Create questions to sort animals

			Scientific enquiry: Fair-testing. How to use the concept of physical education to embed the principals of fair-testing.
	ASSESSMENT WEEK		<u>Key assessment Criteria</u> To know that the two main groups of **animals** are **vertebrates** and **invertebrates and** that the groups of **vertebrates** and **invertebrates** can be broken down further in to smaller sub-group according to observable characteristics. To know that **plants** can be classified into **flowering plants** and **non-flowering plants and** that **plants** can also be **classified** into the groups '**with seeds**' and '**without seeds**' (NC -To describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals.)

Subject: **Science**			
Year group: 6		Unit of Learning: Evolution and inheritance (Biology)	
Prior Knowledge: Pupils should be able to describe how plants and animals are suited to their environment (Y2). They have experience fossils and understand of how they are formed. (Y3) They have used classification keys and should understand that environmental changes can affect the living things within it (Y4). Children should know about the life cycles of different species of plants and animals (Y5)		Heredity as the process by which genetic information is transmitted from one generation to the next. (KS3) • A simple model of chromosomes, genes and DNA in heredity, including the part played by Watson, Crick, Wilkins and Franklin in the development of the DNA model. (KS3) • The variation between species and between individuals of the same species means some organisms compete more successfully, which can drive natural selection. (KS3) • Changes in the environment may leave individuals within a species, and some entire species, less well adapted to compete successfully and reproduce, which in turn may lead to extinction. (KS3)	
Theme	Learning Objective	Substantive Knowledge	Suggested Activity
Session 1 (1 – 1.5 hr)	To recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago	To know that fossils are formed through a process called **fossilisation**, and this takes place over 1000s years. To know that **fossilisation** only happens in certain conditions and that is why not every living creature that dies becomes a fossil. To know that **fossils** provide information about living things that	Carousel of activities Reading articles Identifying and classifying fossils QR code links to clips Reading comprehensions? Pupils understand that fossils provide information about species that lived millions of years ago and can be used to support the theory of evolution.

		inhabited earth millions of years ago but are now **extinct**.	
Session 2 ()	To recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents	To know that many **living things** produce **offspring** (babies) that are the **same species** but **not identical** to their **parents**. To know that in order to **reproduce**, animals need a **male** and a **female** of the same **species**. Together they can create **offspring** when they **mate**. This is called **sexual reproduction**. To know that because 2 people / animals are involved in **reproduction** the **baby / offspring** will **inherit characteristics** from both **parents**.	Talk about labradoodles and that they were originally created in an attempt to create a hypoallergenic guide dogs. Labradors – famously good guide dogs Poodles – fur is more like human hair so less people are allergic https://www.theguardian.com/lifeandstyle/2019/sep/26/labradoodle-inventor-lifes-regret-frankenstein-monster Look at other cross breeds and try to guess parents Pupils consider which characteristic they got from their parents. Discuss nature vs nurture (misconceptions) E.g. If you have brown eyes like your mum you have inherited that from her – the genes for brown eyes were passed from your mum to you. If you're good at football like your dad –its probably not inherited but more to do with the time you spent practising together
Session 3 (2hr)	To identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.	To know that **living things** become well **suited** to the **environment** that they live in. This is called **adaptation**. To know that **adaptation** happens very slowly over **generations** through the **passing** on of **characteristics** from **parents** to **offspring**.	https://www.youtube.com/watch?v=bh8vyeU-J_o - Link to author reading Moth an Evolution Story Using data from Darwin's Galapagos wrens or Manchester industrial revolution and the evolution of peppered moths pupils explain how this evidence supports the theory **WS -**To identify scientific evidence that has been used to support or refute ideas or arguments. 

		ASSESSMENT WEEK	1) To know that because 2 people / animals are involved in **reproduction** the **baby / offspring** will **inherit characteristics** from both **parents**. (NC-To recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents) 2) To know that **living things** become well **suited** to the **environment** that they live in. This is called **adaptation**. To know that **adaptation** happens very slowly over **generations** through the **passing** on of **characteristics** from **parents** to **offspring**. (NC- To identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.)

Subject: **Science**			
Year group: 6			Unit of Learning: Light (Physics)
Prior Learning Prior Learning: Children should recognise that they need light in order to see, know that light is reflected from surfaces, recognise that shadows are formed when the light from a light source is blocked by an opaque object and that the size of shadows changes depending on the direction and distance of the light source from the object.			The similarities and differences between light waves and waves in matter. (KS3) •Light waves travelling through a vacuum; speed of light. (KS3) • The transmission of light through materials: absorption, diffuse scattering and specular reflection at a surface. (KS3) • Use of ray model to explain imaging in mirrors, the pinhole camera, the refraction of light and action of convex lens in focusing (qualitative); the human eye. (KS3) • Light transferring energy from source to absorber leading to chemical and electrical effects; photo-sensitive material in the retina and in cameras. (KS3) • Colours and the different frequencies of light, white light and prisms (qualitative only); differential colour effects in absorption and diffuse reflection. (KS3)
Theme	Learning Objective	Substantive Knowledge	Suggested Activity
Session 1 1 hour	To explore ideas about light using scientific vocabulary. To recognise that light appears to travel in straight lines	To know that we need light to see. To know that light can come from many different **sources**, such as the **sun**, stars, torches, lamps and candles. To know that the **sun** is so powerful that it can damage our **eyes** if we directly look at it. To know that light **travels faster** than anything in the universe and it always **travels in straight lines.**	**Discovery session:** Light travelling from a torch – What provides the light, how does it travel and how is it stopped? Mirrors – How we see through them Periscopes – What could they be used for? How do they work? Diagrams of how we see – What direction does light travel in? Shadows – How are they created? Materials – Which materials are translucent, opaque and transparent CCL – History – WWII search lights British Pathe Blitz CLip BBC Teach Blitz Silent Searchlight Clip
	How do we see things?	To know that **light travels in straight lines.**	Establish that we cannot see without light and how light enters the eye so that we can see.

Session 2 1 hour	To explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes To use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye	To know that when **light** hits an object, it is **reflected** by that object and travels in straight lines to our **eyes**. Our eyes take in some of this **light** and **information** is sent to the **brain**. This is how we **see** the object. To know that some objects such as shiny metal objects **reflect light** better than dark materials which **absorb some of the light**.	- Visit purple room in small groups cover the window in the door and turn out the light. Ask children to explain why they couldn't see? https://www.bbc.co.uk/bitesize/topics/z3nnb9q/articles/zrs62v4 CCL – History – WWII submarines British Navy sink U boat Refer back to discovery session – the use of mirrors and how we see using them. Explore how periscopes could have been used to detect the enemy in German U-Boats or British submarines. - Periscopes were also used in tank warfare and in the field Identify the direction light travels for a soldier to be able to see the enemy. Record using annotated diagrams.
Session 3 1 hour	To use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.	To know a **shadow** is a **dark shape** made when **light** is **stopped** or **blocked** by an **opaque** object or a person. To know some objects are **opaque** which means light **doesn't travel through them**. To know **shadows** are **formed** on the other side of the **opaque object**.	Refer back to discovery session – types of materials and how light travels through them or not. Create shadows and describe how they are made. Form conclusions about different types of materials. Explore whether the size of the shadow can be changed. Use torches and overhead projector to investigate theories.

		To know that **shadows** are the **same shape** as the object making it.	
Session 4 1 hour	**WS** -To plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary	To know that a fair test involves changing one variable – the **independent variable** To know that a fair test involves measuring one variable – the **dependent variable** To know that a fair test involves controlling all the other variables – the **control variable**	**Scientific enquiry:** To plan a fair test to see how the size of a shadow changes. CCL – History – WWII – how shadows may have alerted soldiers of dangers of the enemy. Refer back to previous lesson that shadows do change their size – but how? Plan a fair test – variables, prediction and potential method.
Session 5 1 hour	**WS** - To take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate **WS** -To record data and results of increasing complexity using tables, bar or line graphs		**Scientific enquiry:** To carry out a fair test, record results and form a conclusion. Review the plan and confirm the variables and method. Observe findings and record results. Form a conclusion
	WS -To report and present findings		**Investigation presentation** – To present learning about the changing size of shadows.

Session 6 1 hours	from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations		
		ASSESSMENT WEEK	<u>Key Assessment Criteria</u> To know that we see things because light travels in straight lines from light sources to our eyes or from light sources to objects and then to our eyes (NC- To explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes) To use the idea that light travels in straight lines to explain why shadows have the same shape as the opaque objects that cast them (NC- To use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.)

The Digital Collections of the National WWII Museum
Soldier with Fifth Army patch using periscope in Italy | The Digital Collections of the National WWII Museum

A Scheme of Work designed to make our school a vibrant learning community where all pupils are successful learners. Leaners who are valued and able to thrive. It is designed to engage pupils and motivate them to learn. It is challenging and inspirational, with meaningful outcomes and clearly defined end points, but allows flexibility, to ensure all pupils receive a broad, balanced curriculum and prepares pupils for the next stage of their education and for life in modern Britain and beyond.

An officer aboard the submarine USS Bullhead looking through the aft periscope, about May 1945, location unknown.

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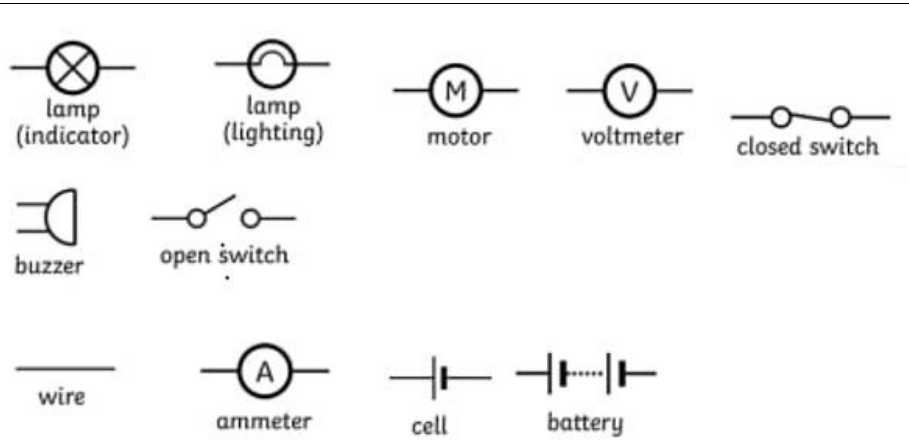
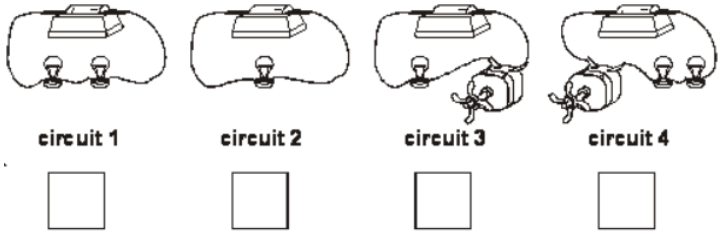
Subject: **Science** - Physics			
Year group: 6			Unit of Learning: Electricity -
Prior Knowledge: Children should be able identify common appliances that run on electricity and construct a simple series electrical circuit and identify whether or not a lamp will light in a simple series circuit. They will understand how switches work and recognise some common conductors and insulators.			**Future Learning:** Electric current, measured in amperes, in circuits, series and parallel circuits, currents add where branches meet and current as flow of charge. (KS3) • Potential difference, measured in volts, battery and bulb ratings; resistance, measured in ohms, as the ratio of potential difference (p.d.) to current. (KS3) • Differences in resistance between conducting and insulating components (quantitative). (KS3) • Static electricity. (KS3)
Theme	Learning Objective	Substantive Knowledge	Suggested Activity
Session 1 (1.5 -2 hr)	**What is electricity? Where does electricity come from?** **How is electricity dangerous?** **What is a circuit and how is it constructed and recorded?** To research electricity and investigate how electricity travels around a circuit.	To know that **electricity** is an **energy** caused by the **flow of electrons**. To know that **electricity** is used to **power** lots of things including **lights, appliances at home, mobile devices and even some cars**. To know that **electricity** can be **dangerous**. To know that an **electrical circuit** is a **complete pathway** that an **electrical current** can **flow around**.	AFL - Vocabulary Definition and word matching to pictures and symbols and labelling circuits. Carousel of activities including; • The history of electricity (CCL history and chronology) • Where electricity comes from and the dangers of electricity (railway) • Practical making circuits • Scientific inventors – Thomas Edison Nikola Tesla • Drawing circuits (teacher led)

		To know that a **circuit** needs a **power supply** as well as other **components** that could include; **wires, bulbs, buzzers, switches and a motor**.	
	What causes a circuit to stop working? **How can you make sure a circuit works?** To compare and give reasons for variations in how components function, including the on/off position of switches use recognised symbols when representing a simple circuit in a diagram.	To know that an **electrical circuit** is a **complete pathway** that an **electrical current** can **flow around**. To know that a **circuit** needs a **power supply** as well as other **components** that could include; **wires, bulbs, buzzers, switches and a motor**. To know that **circuits** can be recorded using **circuit diagrams**	To make predictions about whether a circuit will work based on a diagram. Provide reasons. Build and test the circuit and record findings. Pupils go on to hypothesise based on what they have discovered during this session Which bulb would be the brightest? 

	What effect does voltage have on the components of a circuit? **How can we make a bulb brighter/ buzzer louder?** To associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit To compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers	To know that **voltage** is the **force** that **pushes** the **electrons** around a **circuit**. To know that the **greater** the **voltage** within a **circuit** the **more power** the **components** will get meaning; **bulbs will be brighter, buzzers louder, motors faster** etc	To plan and carry out a fair test. Make predictions and justify reasons. Observe outcomes and form results and report a conclusion. Provide scenarios to choose from to investigate Using the format 'Does the _____ effect the _____?' E.g. 'Does the number of cell effect the brightness of the bulb?'
	Assessment <u>Key Assessment Criteria</u> To know that an electrical circuit is a complete pathway that an electrical current can flow around and that a circuit needs a power supply as well as other components that could include; wires, bulbs, buzzers, switches and a motor.		Science Escape Room Challenge?

	(NC- To compare and give reasons for variations in how components function, including the on/off position of switches use recognised symbols when representing a simple circuit in a diagram.) To know that voltage is the force that pushes the electrons around a circuit so the greater the voltage within a circuit the more power the components will get meaning; bulbs will be brighter, buzzers louder, motors faster (NC - To compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers)	
	Cross Curricular Learning	History – electricity chronology Geography – where electricity comes from and sustainability Cultural capital and Global learning – Nikola Tesla and the electric car information for 21st Century citizens

Subject: **Science**			
Year group: 6			Unit of Learning: Animals including humans circulatory system
Prior Learning: In Year1 pupils learn the scientific names for human body parts. They have gone on to learn about the function of the skeletal (Y3) and digestive system (Y4).			**Future Learning:** 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)
Theme	Learning Objective	Substantive Knowledge	Suggested Activity
Session 1 (1 hr)	What do we already know about the heart and what would you like to find out?		Discovery session: AFL Children access a range of activities to activate prior knowledge and introduce new learning Base 1 – Heart and lung dissection Base 2 – Reading activity Base 3 – Video activity Base 4 – Pulse activity Retrieval quiz
Session 1 (1 hr)	**What are the different parts of the circulatory system called?** **How does the circulatory system work?** To identify and name the main parts of the human circulatory system, and describe	To know your circulatory system has three main parts: 1. **The Heart** which pumps blood around your body. 2. **The Blood vessels** which carry the blood. 3. **The Blood**. To know that **blood** transports **oxygen**, **water** and **nutrients** around the body to where it is needed.	Body maps children to draw, explain or act out how the circulatory system works.

	the functions of the heart, blood vessels and blood	To know that there are three types of **blood vessel**: **Arteries** carry blood away from the heart. **Veins** carry blood back to the heart. **Capillaries** are tiny vessels which carry blood into your organs and tissues. To know that **blood is transported to the lungs**. To know that **oxygen** passes through the **lung** walls into the **red blood cells**.	
Session 1 (1 hr)	**How can I use a graph to record my pulse rate?**		Reading line graphs. Recording data before, during and after exercise. CCL – Maths statistics
Session 1 (1 hr)	**How can I keep my circulatory system healthy?** • To recognise the impact of diet, exercise, drugs and lifestyle on the	To know that **exercise** is important because it **strengthens** you **muscles** including your **heart** and helps to prevent **fat** clogging your **blood vessels** which can lead to serious **illness**. To know that **drugs** effect how the body works and some can be very **harmful**.	https://www.bbc.co.uk/bitesize/topics/zcyycdm/articles/zk784xs Recall prior learning about exercise, eating, sleep and drugs. Focus on eating – types of foods and the food labelling system.

	way their bodies function	To know that eating a **balanced diet** means your body gets all the **nutrients** that it needs but doesn't get too much **fat or sugar**.	
Session 1 (1 hr)	**How are nutrients transported in animals including humans?** **How are nutrients and water from our food processed so our bodies can use them?** • To describe the ways in which nutrients and water are transported within animals, including humans.	To know that **blood** transports **oxygen**, **water** and **nutrients** around the body to where it is needed. To know that in the **small intestines food** is broken down and **nutrients** are **absorbed** into the **blood** and transported to where it is needed in the body. To know that in the **large intestines** water is **absorbed** into the **blood** and transported to where it is needed in the body.	Video footage from STEM about the digestive system Practical digestive system. https://www.youtube.com/watch?v=aemI64NAK08 https://www.bbc.co.uk/bitesize/topics/zcyycdm/articles/z9w9r2p * Cross-curricular Writing. Describe the journey food takes through the digestive system.
	CCL – Personal Educations • To recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function		Drugs education: cannabis Maths: statistics – reading and recording line graphs Reading: non-fiction retrieval Writing: The Heart (formal for a non-fiction text, informal in the first person for a YouTube channel)
Session 1 (1 hr)	Assessment.		NC- To identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood NC -To recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function

Q1.

Pulse rate

(a) Class 6 are learning about the human body.

Complete the sentences below using the words in the box.

skull	vessels	lungs	heart	ribs	brain

The ..... pumps blood around the body.

The ..... carry blood around the body.

The ..... protect the heart.

1 mark

(b) Your pulse rate tells you how fast your heart is beating.

Tick **ONE** box to show what equipment you could use to workout your pulse rate.

ruler	☐	forcemeter	☐
stopwatch	☐	thermometer	☐

1 mark

(c) Class 6 have some ideas about pulse rate.

Write **true** or **false** next to each statement about pulse rate.

	True or **false?**
Different types of exercise can affect pulse rate by different amounts.	.....
Different people can have different resting pulse rates.	.....
A high pulse rate means the heart is beating fast.	.....

1 mark

(d) Class 6 investigate the effect of exercise on pulse rate.
They measure Emily's pulse rate three times:

1. at rest.
2. straight after running for 10 minutes.
3. after resting for 20 minutes.

Look at the table of results below.
Some of Emily's pulse rates are missing.

Complete the table of results by predicting Emily's pulse rates straight after running and after resting for 20 minutes.

	At rest before running	After running for 10 minutes	After resting for 20 minutes
Pulse rate (heart beats per minute)	90	.....	.....

1 mark

(e) Class 6 think of some questions about the heart and exercise.

Tick **THREE** boxes to show which questions the class could investigate by doing a fair test.

- Where is the heart found in the body? ☐
- How does age affect a person's heart rate? ☐
- How does the heart work? ☐
- What does the heart look like? ☐
- Do tall people have faster pulse rates than short people? ☐

Do people who exercise regularly eat more food than people who do not exercise?

☐

2 marks

Q2.

The heart

(a) Denise uses a stethoscope.
She listens to Joe's heartbeat before Joe exercises.

As soon as Joe stops exercising, Denise listens again. Joe's heartbeat is louder.

Describe one other change in Joe's heartbeat straight after exercise compared with before exercise.

.....

1 mark

(b) Denise and Joe collect information from four adults. The table shows what they find out.

Adult	Exercises regularly	Eats a balanced diet	Smokes regularly	Cleans teeth regularly
A	✗	✗	✓	✗
B	✓	✓	✗	✗
C	✓	✓	✗	✓
D	✓	✗	✓	✓

Which **TWO** adults are most likely to have healthy hearts?

Write **A**, **B**, **C**, or **D**.

..... and .....

1 mark

Q3.

The circulatory system

(a) 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**?

Tick **TWO** boxes.

swimming	☐	resting	☐
stretching	☐	running	☐

1 mark

(b) What do we measure to find out how fast the heart is pumping?

.....

1 mark

(c) What is the heart made from?

Tick **ONE** box.

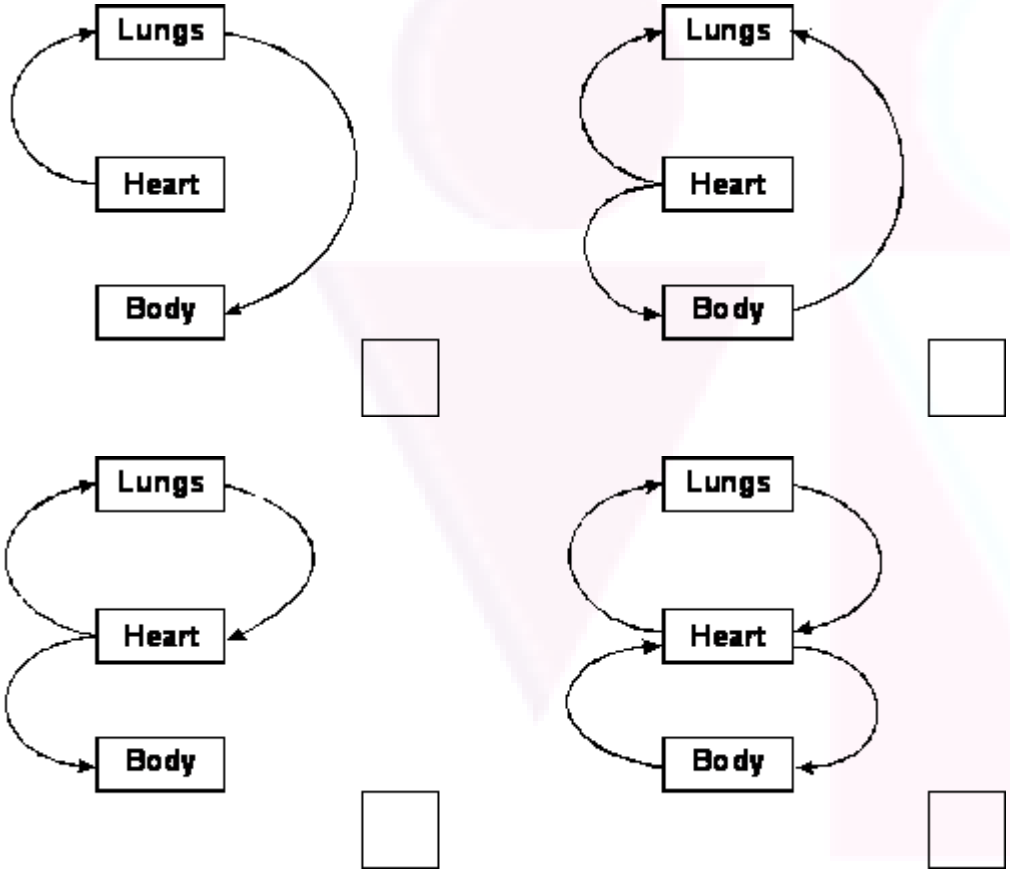
muscle	☐	blood	☐
bone	☐	skin	☐

1 mark

(d) The heart pumps the blood.

Which diagram best shows the path of the blood as it circulates?

Tick **ONE** box.



1 mark

(e) When the heart pumps the blood faster, we also breathe faster.

Complete this sentence.

*We breathe **faster** because the body needs to*

take more ..... into the lungs.