Medium Term Plan: Electricity Y5/6						
Enquiry Type:	Working Scientifically Concept	s:	Previous Scientific Vocabulary	New Scientific vocabulary		
<ul> <li>Comparative and fair testing</li> <li>Pattern seeking</li> <li>Research using secondary sources</li> <li>Identifying, classifying and grouping</li> </ul>	<ul> <li>Asking questions</li> <li>Making observations and measuring them</li> <li>Engaging in practical enquiry</li> <li>Recording and presenting evidence</li> <li>Answering questions and concluding</li> <li>Evaluating and predicting</li> <li>Communicating findings.</li> </ul>		<ul> <li>conductor</li> <li>insulator</li> <li>switch</li> <li>circuit</li> <li>buzzer</li> <li>cells</li> <li>wire</li> </ul>	<ul> <li>battery</li> <li>component</li> <li>motor</li> <li>voltage</li> <li>function</li> <li>symbols</li> <li>series</li> </ul>		
Previous Learning End Point Assessment in this concept:		Previous Learning End Point Assessment in working scientifically concepts:	End Point Assessment Statements:	• parallel		
<ul> <li>Electricity: <ol> <li>I can identify common appliances that run on electricity (e.g. TV, oven, fridge, computers, mobile phones).</li> <li>I can name and identify the basic components of a circuit: wires, cells, bulbs, switches and buzzers.</li> <li>I can construct a simple electrical circuit, including: cells, wires, bulbs, switches and buzzers, naming and identifying the different parts.</li> <li>I can explain the role of different electrical components and what would happen if they were altered or not used.</li> <li>I can identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop - with a battery</li> <li>I can recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit</li> <li>I can recognise some common conductors (copper, aluminium, gold) and insulators (glass, air, plastic, rubber), and associate metals with being good conductors.</li> </ol> </li> </ul>		I can draw on prior knowledge to help answer a question. I can make systematic and careful observations. I can use a range of equipment for measuring length, time, temperature and capacity. I can record my measurements e.g. using tables, tally charts and bar charts (given templates when needed). I can interpret the data to generate simple comparative statements based on my evidence. I can begin to identify naturally occurring patterns and causal relationships.	<ul> <li>Electricity:</li> <li>1. I can make observations about the brightness of a lamp voltage varies.</li> <li>2. I can associate the brightness of a lamp or the volume of circuit</li> <li>3. I can predict the outcome of tests involving the brightness of cells or voltage varies.</li> <li>4. I can explain and evaluate the impact that cell numbers a buzzer.</li> <li>5. I can compare and give reasons for variations in how co loudness of buzzers and the on/off position of switches.</li> <li>6. I can explain how components function, including the b position of switches.</li> <li>7. I can use recognised symbols when representing a simple</li> </ul>	or the volume of a buzzer where the number of cells or f a buzzer with the number and voltage of cells used in the ess of bulbs or the loudness of a buzzer where the number or voltage has on the brightness of the bulb or loudness of mponents function, including the brightness of bulbs, the rightness of bulbs, the loudness of buzzers and the on/off le circuit in a diagram (cell, wire, bulb, buzzer, switch).		

	Revisit of knowledge short Afl lesson	Lesson 1 and 2	Lesson 3	Lesson 4	Lesson 5 + 6	Lesson 7
Learning Question		Can you make circuits from diagrams and diagrams from circuits	Does the number of cells / voltage affect the brightness of a bulb?	Does the number of cells / voltage affect the loudness of a buzzer?	Can you design and carry out your own investigation to compare and give reasons for variations in component functions?	How does a series circuit differ to a parallel circuit.
Enquiry Type		Pattern seeking Identifying, classifying and grouping	Fair and comparative test	Fair and comparative test	Fair and comparative test	Identifying, classifying and grouping
Conceptual Knowledge	Prior end of blocks assessment	I can use recognised symbols when representing a simple circuit in a diagram (cell, wire, bulb, buzzer, switch).	I can make observations about the brightness of a lamp or the volume of a buzzer where the number of cells or voltage varies. I can associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit I can predict the outcome of tests involving the brightness of bulbs or the loudness of a buzzer where the number of cells or voltage varies. I can explain and evaluate the impact that cell numbers or voltage has on the brightness of the bulb or loudness of a buzzer		I can compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches. I can explain how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches.	I can use recognised symbols when representing a simple circuit in a diagram (cell, wire, bulb, buzzer, switch).
Working Scientifically		I can select from a range of practical resources to gather evidence to answer their questions.	I can use the scientific knowledge gained from er investigate using comparative and fair tests. I can decide how to record and present evidence I can record measurements e.g. using tables, tally graphs. In my conclusions, I can: identify causal relations evidence; identify results that do not fit the over subject knowledge.	nquiry work to make predictions I can y charts, bar charts, line graphs and scatter hips and patterns in the natural world from my all pattern; and explain my findings using my	I can use the scientific knowledge gained from enquiry work to make predictions I can investigate using comparative and fair tests.	I can record classifications e.g. using tables, Venn diagrams, Carroll diagrams and classification keys. I can present the same data in different ways in order to help with answering the question.

		Light Y3/4:	Sound Y3/4	Animals including humans (teeth) Y3/4	Animals including humans (digestion) Y3/4	State of matter Y3/4:
		1. <u>https://wordwall.net/</u>	1. <u>https://wordwall.net/resource/7804340/y4-</u>	1. <u>https://wordwall.net/resourc</u>	1. <u>https://wordwall.net/resource</u>	1. <u>https://wordwall.net/resourc</u>
Concept		resource/2898124/science/light-	changing-volume	e/2916595/science/types-of-teeth-	/11288156/science/digestive-	e/2372616/science/year-4-states-
flashback		sources-year-3	2. What is pitch?	<u>year-4</u>	<u>system-quiz</u>	of-matter-key-knowledge-water-
(previous		2. Define natural source		2. Define enamel and decay	https://wordwall.net/resource	<u>cycle</u>
phase or					/2862736/science/labeling-the-	2. Define solid, liquid and gas (can
earlier in					digestive-system-year-4	draw to show these – particle
tile year)					2. Define molar (show image for	diagram)
					stimuli)	
	Range of short	1. Knowledge from previous end point	1. Knowledge from previous end point	1. Knowledge from previous end point	1. Knowledge from previous end point	1. Knowledge from previous end
Review/	activities:	assessment in the concept	assessment in the concept	assessment in the concept	assessment in the concept	point assessment in the concept
Revisit	<ul> <li>recognising</li> </ul>		2. Label the components	2. Label the components	2. Label the components	2. Label the components
	symbols					
Read	- will the lamp	Page 73 – pre-read recap	Page 74 – pre-read on need for components	Page 75 – circuit diagrams.	Page 78 – additional resource also for idea	Page 78 – summary of what we have
	light up if?	https://oxplorify.uk/op/ac	What a hypothesis and prediction are	Introduce a data collector (decibels) and	stimulation	Investigated.
	- grouning	tivities/zoom-in-zoom-out/inside-out	what a hypothesis and prediction are.	explain what this does Children to predict	Show children resistance wire and what this	from across the unit
	materials on their	Starter – what am I.	What do they think will happen and why?	which component this apparatus would be	is. Recap why we can use this material	Introduce a parallel circuit.
	conductivity and	Watch the video and children are to try		needed for.	compared to insulators (link to prior learning	· ·
	insulator	and write down as many appliances as	Recap different variables and what makes a		in the concept).	Look at household's appliances and
	capabilities.	they can which they think use electricity.	comparative and fair test.	Recap the variables and any misconceptions		electrical use – series or parallel
				in the previous week with working	Possible independent variables:	
Teach		Use the electricity wand to show children	How can you measure brightness? – discussion	scientifically skills.	- number of bulbs on the brightness of a bulb	Look at some parallel circuits and what will
		now you need a constant flow of	Idea to generate possible methods for	Teach validity – what this means and links to	- thickness of the wire on the brightness of a	and wont work in these and WHY.
		to disconnected wires and switches	measurement.	previous reflection tasks	- length of resistance wire on the brightness	After practice: what did we find? Address
		to also interest with switches.	What the term correlation means and different		of a bulb	misconceptions and teach the science
		Based off practice – teach which each	types of correlation		- number of buzzers on the brightness of a	behind each circuit working or not working
		component is.			bulb	(mini teacher opportunity)
		Discussion during the teach.	Discussion on how to measure brightness.	Deciding which variables they will need to	Change what an exactive and fair test to	In groups, looking at the different circuits
		Match the symbols to their component	Deciding which variables they will need to	change, measure and keep constant.	conduct and the variables	(series and parallel), children are to identify
		name (bulb cell etc)	change measure and keep constant	Carry out the investigation and collate	conduct and the variables.	which ones will and will not work and willy.
				results.	Carry out the investigation and collate	
		After, ask the children if this circuit will	Carry out the investigation and collate results.	<ul> <li>learning from previous lesson</li> </ul>	results.	
Practico		— work:		- draw diagram for basic initial circuit.		
Practice					learning from previous lesson	
		······				
		Give the children three drawn circuits for	Decide what type of graph they will need to do.	Decide what type of graph they will need to	Conclusion and commentary on validity.	Match the circuit diagram to the written
		them to replicate and state if they do or		do.		description and explain why they have
		do not work.	Draw a conclusion based on their findings.			made this decision to group these two
Apply		Children are to then create a circuit and		Draw a conclusion based on their findings.		diagrams and explanations.
		then draw this circuit – stating if it works				
		or doesn't work and why this is.		Comment on the validity of their results.		
		wires switch				
		Share findings and why children	Why did people's results differ?	Concept cartoon – wire consideration.	Share your findings with another group who	Share ideas and reasons for grouping.
		deciphered that outcome.	Dies the difference across groups affect the		investigated something different.	Succession and reasons to Broading.
			validity? Why or why not?	Tami for skater. I have site get ender to store that Store spreng strength on the store store		
Reflect						
				E C 🗃 5.2 🖬 Com D		
End of Unit As	sessment:					

Range of different circuits: will the circuit work – prediction. Carry it out and state if it did or did not work. Explain reasons for working and not working.

Medium Term Plan: Light Y5/6								
Enquiry Type:	Working Scientifically Concepts:	Previous Scientific Vocabulary	New Scientific vocabulary					
<ul> <li>Comparative and fair testing</li> <li>Pattern seeking</li> <li>Research using secondary sources</li> <li>Identifying, classifying and grouping</li> </ul>	<ul> <li>Asking questions</li> <li>Making observations and measuring them</li> <li>Engaging in practical enquiry</li> <li>Recording and presenting evidence</li> <li>Answering questions and concluding</li> <li>Evaluating and predicting</li> <li>Communicating findings.</li> </ul>	<ul> <li>Light</li> <li>Shadow</li> <li>Darkness</li> <li>Man-made</li> <li>Natural</li> <li>Protection</li> </ul>	<ul> <li>Reflect</li> <li>Light</li> <li>Straight line</li> <li>refraction</li> <li>Thomas Edison</li> <li>retina</li> <li>optic nerve</li> <li>brain</li> </ul>					

Previous Learning End Point Assessment in this concept:	Previous Learning End Point Assessment in working scientifically	End Point Assessment Statements:
	concepts:	
Light:	I can draw on prior knowledge to help answer a question.	Light
1. I can recognise that we need light in order to see things and that dark is the absence of	I can make systematic and careful observations.	1. I can use the idea that light travels in
light.	I can use a range of equipment for measuring length, time, temperature	give out or reflect light into the eye.
2. I can notice that light is reflected from surfaces.	and capacity.	2. I can explain that light comes from s
3. I can describe the process of reflection using scientific vocabulary.	I can record my measurements e.g. using tables, tally charts and bar charts	darkness is the absence of light.
4. I can recognise that light from the sun can be dangerous and that there are ways to	(given templates when needed).	3. I can explain that we see things beca
protect your eyes (e.g. sun-glasses, avoid looking at the sun, sun-cream)	I can interpret the data to generate simple comparative statements based	sources to objects and then to our eye
5.I can recognise that shadows are formed when the light (from a light source) is blocked	on my evidence.	4. I can identify different parts of the e
by a solid (opaque) object.	I can begin to identify naturally occurring patterns and causal relationships.	5.I can use the idea that light travels in
6. I can explore and find patterns in the way that the size of shadows can change.		as the objects that cast them.
7. I can predict and explain why these changes occur, using what I already know.		

	Revisit of knowledge short Afl lesson	Lesson 1	Lesson 2	Lesson 3 and 4	Lesson 5	Lesson 6	Lesson 7
Learning Question		How are shadows formed?	How does the position of a light source affect the size of a shadow?	Why do we see the moon?	How can a submarine see where it is going?	Are all soap bubbles the same colour? Why do we see a rainbow?	What significance did Thomas Edison have in the study of light?
Enquiry Type		Identifying, classifying and grouping	Fair and comparative test	Research using secondary sources	Research using secondary sources Pattern seeking	Pattern seeking	Research using secondary sources.
Conceptual Knowledge	Prior end of blocks assessment	I can explain that light comes from sources and that we need light to see things and that darkness is the absence of light. I can use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.	. I can explain that light comes from sources and that we need light to see things and that darkness is the absence of light.	I can identify different parts of the eye and understand the role they play in helping us see. I can 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.	I can 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	I can 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	I can explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda. I can demonstrate that dissolving, mixing and changes of state are reversible changes
Working Scientifically		I can present the same data in different ways in order to help with answering the question. I can answer my own and others' questions based on observations I have made, measurements I have taken or information I have gained from secondary sources.	I can decide how to record and present evidence. I can record observations e.g. using annotated photographs, videos, labelled diagrams, observational drawings, labelled scientific diagrams or writing. I can record measurements e.g. using tables, tally charts, bar charts, line graphs and scatter graphs.	I can answer my own and others' questions based on observations I have made, measurements I have taken or information I have gained from secondary sources. When doing this, I can discuss whether other evidence e.g. from other groups, secondary sources and my scientific understanding, supports or refutes their answer.	I can answer my own and others' questions based on observations I have made, measurements I have taken or information I have gained from secondary sources. When doing this, I can discuss whether other evidence e.g. from other groups, secondary sources and my scientific understanding, supports or refutes their answer.	I can: identify causal relationships and patterns in the natural world from my evidence; identify results that do not fit the overall pattern; and explain my findings using my subject knowledge. I can look for patterns and relationships using a suitable sample.	I can answer my own and others' questions based on observations I have made, measurements I have taken or information I have gained from secondary sources. When doing this, I can discuss whether other evidence e.g. from other groups, secondary sources and my scientific understanding, supports or refutes their answer.
Concept Flashback (previous phase or earlier that vear)		Light Y3/4: 1. <u>https://wordwall.net/resourc</u> <u>e/3068802/science/mirror-</u> <u>reflection-year-3</u> 2. Define reflection	Electricity Y5/6: 1. <u>https://wordwall.net/resource</u> /2898861/science/electricity- <u>vocabulary-year-6</u> 2. Define voltage	Electricity Y5/6 1. <u>https://wordwall.net/reso</u> <u>urce/2898835/science/electricity-</u> <u>vocabulary-year-6</u> 2. define conductor and insulator	Forces and magnets Y3/4 1. <u>https://wordwall.net/res</u> <u>ource/2404881/science/year-3-</u> <u>forces-magnets-key-vocabulary</u>	<ul> <li>Rocks and Soil Y3/4:</li> <li><u>https://wordwall.ne</u> <u>t/resource/2917101/science/rock-</u> <u>descriptions-year-3</u></li> <li>Define fossilisation</li> </ul>	Plants Y3/4: 1. <u>https://wordwall.net/resou</u> <u>rce/4001291/science/sunflower-</u> <u>life-cycle</u> 2. Define pollination

in straight lines to explain that objects are seen because they

sources and that we need light to see things and that

ause light travels from light sources to our eyes or from light

eye and understand the role they play in helping us see. In straight lines to explain why shadows have the same shape

Review/ Revisit	Concept map for children to annotate off: - sort man- made and natural light	1. Knowledge from previous end point assessment	<ol> <li>1. Knowledge from previous end point assessment</li> <li>2. What is the animal based of the shadow? How do you know?</li> </ol>	<ol> <li>1. Knowledge from previous end point assessment</li> <li>2. What impacts on the size of a shadow?</li> </ol>	<ol> <li>Knowledge from previous end point assessment</li> <li>Shadows and how we see an apple/toothbrush etc?</li> </ol>	<ol> <li>Knowledge from previous end point assessment</li> <li>Will this submarine be able to see (similar to reflect on previous lesson)</li> </ol>	<ol> <li>Knowledge from previous end point assessment</li> <li>Shadow sizes.</li> <li>Submarines and light travelling in straight line.</li> <li>Label the eye.</li> </ol>
Read	sources - think about safety from the sun	Page 80 – Y3/4 phase recap Knowledge mat	Concept cartoon One anothers findings Knowledge mat	Page 82 – pre-read for background knowledge Knowledge mat	Page 83 – read before application as summary for what we have covered so far. Knowledge mat	Part of teach on flip Concept cartoons Knowledge mat	Shortened biography of Thomas Edison
Teach	- what is darkness - shadows changing over the day what is a shadwow?	Introduce 'light' - what do you know already about light? What is a light source? Sort into natural and man-made (pairs activity). How does it travel? Explain it travels in straight lines. (Talcum powder and a torch demo). Show children the video of attraction https://www.youtube.com /watch?v=Xes3huBpnQc Ask them how it works and allude to the fact that it is shadows that are forming. How do shadows work? Put a picture of the shadow of a giraffe on the board and ask what animal is it and how they know – shadows take the form of the object they are casted from.	<ul> <li>What is a shadow recap – address any misconceptions from prior learning and afl of application in books.</li> <li>Recap variables and what will the children be measuring.</li> <li>Discuss the appropriate measuring tools for the dependent variable.</li> <li>Discussion around controlling variable and teach the term validity – explain what this means and how it can impact results.</li> </ul>	<ul> <li>Human eye and its functions – look at the human eye to understand it biologically.</li> <li>Discuss how blindness can be due to an impairment of different structures of the eye – not always the same.</li> <li>Look at how we see an apple – application of knowledge.</li> <li>Teach about light travelling in straight lines and reflection Link to light sources (Y3 – what does source mean, difference between man-made and natural).</li> <li>Rule of three Which resources do you use when researching</li> </ul>	<ul> <li>Provide the children with different challenge and using the tubes they must 'prove' each statement.</li> <li>→ light can travel in a straight line, showing how light does not bend, how a reflective surface can cause light to 'change' direction.</li> <li>Teach how light travels in a straight line – bring it back to light and the talcum powder in lesson 1 (video link on YouTube if needed).</li> <li>Introduce what a submarine is and how they see – periscope.</li> </ul>	Pose the question and give the children bubbles and allow them to explore what they observe – pattern seeking. Talk about what is occurring scientifically. Introduce (in person) the straw appearing bent and the arrow in the water and how this is due to a process called refraction. Look at what causes a rainbow – process of refraction and colour spectrum.	Who is Thomas Edison – ask if the children have heard of him? Why is he important? How to research and using the recommended website pages effectively.
Practice		Children to guess who is who from the shadows of the class.	Discussion of variables. Carry out the investigation and collate results accordingly.	Labelling the human eye and understanding the process of light entering the eye and the optic nerve sending impulses to the brain.	Using the statements to prove that light can travel in a straight line, showing how light does not bend, how a reflective surface can cause light to 'change' direction	Discussion about objects appearance and what this is showing. Children to explore different challenge with changing medium to observe refraction in different ways.	Answering the first question as a class in the research pack – sharing tips etc.
Apply		Written explanation of how they knew who each person was – shadows take the form of the object which cast them.	Conclusion of data and evaluation of the procedure.	How do we see the moon? Children to produce a poster in pairs answering the enquiry question. They must denote the process and can use diagrams or written explanations for this process.	Pose the question: How can a submarine see where it is going? In groups, children are to design a periscope for a submarine to use (use equipment). Draw a scientific diagram of a working periscope and write a short explanation of what they have found.	<ul> <li>What causes a rainbow?</li> <li>children to write their own response (using a key word resource bank) to explain why we see rainbows</li> </ul>	Complete and design a poster or leaflet or fact sheet card (children to decide how to present findings) on the significance of Thomas Edison. Share ideas – magpie ideas from another pair (pair stray).
Reflect	scoremont.	Why is this shadow not fully formed?	Discuss the concept cartoon: class answer to be written in all books in blue pen	Diagram and written explanation of seeing an apple – do you agree with it? Why or why not?	Will this submarine periscope work? Why or why not?	Concept cartoon – in books (write their responses) and then in blue pen write the class response. Refraction of the straw	Statement about Edison to think and consider

Concept cartoon carousel in pairs – who do you agree with and why. Discuss answers.

Design their own concept cartoon for other children to answer

Medium Term Plan: Forces Y5/6									
Enquiry Type:	Working Scientifically Concepts:		Previous Scientific Vocabulary		New Scientific vocabulary				
Comparative and fair testing	Asking questions     Making observations and measuring	a thom	force     magnet		gravity				
<ul> <li>Pattern seeking</li> <li>Research using secondary sources</li> </ul>	<ul> <li>Engaging in practical enquiry</li> </ul>	g mem	<ul><li>attract</li></ul>		water resistance				
	<ul> <li>Recording and presenting evidence</li> <li>Answering questions and concludin</li> </ul>	ę	<ul> <li>repel</li> <li>noles</li> </ul>		<ul> <li>friction</li> <li>weight</li> </ul>				
	Evaluating and predicting	0	<ul> <li>magnetic field</li> </ul>		• mass				
	Communicating findings.				<ul> <li>drag</li> <li>thrust</li> </ul>				
Previous Learning End Point Assessment in this concept:		Previous Learning End Point Assessme	ent in working scientifically	End Point Assessment St	atements:				

	-	
Previous Learning End Point Assessment in this concept:	Previous Learning End Point Assessment in working scientifically	End Point Assessment S
	concepts:	
Forces and Magnets:	I can draw on prior knowledge to help answer a question.	Forces:
1. I can compare how things move on different surfaces.	I can make systematic and careful observations.	1. I can explain that uns
2. I can recognise that some forces need contact between two objects, but magnetic forces can act at a distance	I can use a range of equipment for measuring length, time,	of gravity acting betwee
3. I can observe how magnets attract or repel each other and attract some materials and not others.	temperature and capacity.	2. I can identify the effe
4. I can describe magnets as having two poles	I can record my measurements e.g. using tables, tally charts and bar	between moving surfac
5. I can predict whether two magnets will attract or repel each other, depending on which poles are facing.	charts (given templates when needed).	3. I can explain how air
6. I can group everyday materials on the basis of whether they are attracted to a magnet.	I can begin to identify naturally occurring patterns and causal	4.I can recognise that so
7. I can compare and group everyday materials on the basis of whether they are attracted to a magnet and	relationships.	smaller force to have a
identify some magnetic materials.		
8 L can make scientific predictions, using prior knowledge, about unfamiliar materials		

	Revisit of knowledge short Afl lesson	Lesson 1	Lesson 2 and 3	Lesson 4 and 5	Lesson 6	Lesson 7
Learning Question	What can I remember forces and magnets	How are weight and mass related?	Does shape affect the amount of air resistance?	Which general shape of boat experiences the least amount of water resistance? Challenge: Does a boat experience more or less upthrust in salty water?	How can frictions affect a moving object?	How do levers, pulleys and gears operate?
Enquiry Type		Pattern seeking	Comparative and fair test	Comparative and fair test	Comparative and fair test	Research using secondary sources
Conceptual Knowledge	Prior units end point assessment	can explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object	I can identify the effects of air resistance, water resistance and friction, that act between moving surfaces I can explain how air resistance, water resistance and friction acts on objects.	I can identify the effects of air resistance, water resistance and friction, that act between moving surfaces I can explain how air resistance, water resistance and friction acts on objects.	I can identify the effects of air resistance, water resistance and friction, that act between moving surfaces I can explain how air resistance, water resistance and friction acts on objects.	I can recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.
Working Scientifically		In my conclusions, I can: identify causal relationships and patterns in the natural world from my evidence; identify results that do not fit the overall pattern; and explain my findings using my subject knowledge.	I can carry out fair tests, recognising and controlling variables. I can decide how to record and present evidence. I can record measurements e.g. using tables, tally charts, bar charts, line graphs and scatter graphs. I can identify any limitations that reduce the trust I have in my data.	I can carry out fair tests, recognising and controlling variables. I can decide how to record and present evidence. I can record measurements e.g. using tables, tally charts, bar charts, line graphs and scatter graphs. I can discuss whether other evidence e.g. from other groups, secondary sources and my scientific understanding, supports or refutes their answer.	I can carry out fair tests, recognising and controlling variables. I can decide how to record and present evidence. I can record measurements e.g. using tables, tally charts, bar charts, line graphs and scatter graphs. I can use the scientific knowledge gained from enquiry work to make predictions I can investigate using comparative and fair tests.	I can communicate my findings to an audience using relevant scientific language and illustrations. I can use resources to gather evidence for a question. I can recognise when secondary sources can be used to answer questions that cannot be answered through practical work.
Concept Flashback (prior phases or earlier in the year)		Electricity Y5/6: 3. <u>https://wordwall.net/resource</u> <u>/2898861/science/electricity-</u> <u>vocabulary-year-6</u> 4. Define insulator and conductor	Light Y5/6 1. <u>https://wordwall.net/res</u> <u>ource/2862597/science/light-quiz-year-6</u> 2. Define reflection	<ul> <li>Animals including humans (digestion and teeth) Y3/4:</li> <li>1. Label the teeth on a diagram</li> <li>2. Define the role of the stomach in digestion</li> </ul>	Living things and their habitats Y3/4: 1. <u>https://wordwall.net/resou</u> <u>rce/2371083/science/year-4-living-</u> <u>things-their-habitats-key-vocabulary</u>	Light Y5/6: 1. <u>https://wordwall.net/resour</u> <u>ce/2972373/science/the-structure-of-the-</u> <u>eye-year-6</u> 2. Define the role of the optic nerve

supported objects fall towards the Earth because of the force een the Earth and the falling object

ects of air resistance, water resistance and friction, that act ces

r resistance, water resistance and friction acts on objects. some mechanisms, including levers, pulleys and gears, allow a a greater effect.

Review/ Revisit	Low Stakes Quiz on Kahoot.	<ol> <li>Previous end point assessment gaps</li> <li>What they already know about key terms.</li> </ol>	<ol> <li>Previous end point assessment gaps</li> <li>Mass and weight</li> <li>Reading concept cartoons</li> </ol>	<ol> <li>Previous end point assessment gaps</li> <li>Mass and weight</li> <li>What is air resistance? – give an example for application of learnt knowledge</li> <li>Before water resistance read KS2 science</li> </ol>	<ol> <li>Previous end point assessment gaps</li> <li>Mass and weight</li> <li>What are air and water resistance? – give an example for application of learnt knowledge</li> <li>Their scenario</li> </ol>	<ol> <li>Previous end point assessment gaps</li> <li>Mass and weight</li> <li>What are air and water resistance? – give an example for application of learnt knowledge</li> <li>What is friction?</li> <li>Additional research once they've explored</li> </ol>
Read		Basics of what they should know from Y3. What is gravity etc.	Prior information from KS2 science book Explanations within teach	pages on air resistance as a revisit	Graphs and others graphs	the concept
Teach		Key terms.	Look at what air resistance is. Model examples of falling objects – talk about the general findings and awareness of falling objects (link to previous lesson). How to calculate the mean and why in investigations results are carried out multiple times (validity)	What water resistance is – based off what they about air resistance. Use diagrams to illustrate air resistance and use prior knowledge to stimulate thoughts. <u>https://www.bbc.co.uk/teach/class-clips- video/investigating-air-and-water- resistance/z4m6nrd</u>	Friction and how it counteracts the force moving the object. Drawing arrows on diagrams to showcase this scientific process. Children to understand that air resistance and water resistance are types of friction and we have already explored these examples. Introduce that the children are to use toy cars to explore which surface a cyclist should take if their brakes failed and they had to go	Begin by looking at who Issac Newton is and how is he linked to forces (brief look at this laws of motion). https://www.bbc.co.uk/teach/class-clips- video/science-ks2-discovering-the-work- of-Sir-Isaac-Newton/zr4mf4j Introduce the terms: lever, pulley and gears.
Practice		Concept cartoon	Making predictions on falling objects during input as their knowledge and awareness increases. Planning the investigation as a group – what the different variables will be.	Decide what the variables will be when planning the investigation. How will you change this? Will you collate multiple results? Why?	down a path. Drawing arrows on diagrams as groups. Hypothesising what will happen and what their variables will be.	<ul> <li>Sequence of activities: <ol> <li>How can you use a stick, real and string to lift a mug?</li> <li>Does the number of pulleys affect how much force is needed to lift an object? (spinning wheels and milk bottle).</li> <li>Why can't an adult play on a seesaw with a child?</li> <li>Can you use a lever to balance a one pound and one pence coin? (use pen and ruler for fulcrum and lever).</li> </ol> </li> <li>What is a gear? (video to launch and look at toys).</li> </ul>
Apply		Pattern seeking enquiry: - relationship between mass and weight of different classroom objects.	Conducting the investigation and concluding. Using this information, children will then plan another way of measuring and exploring air resistance – assessment opportunity.	Make boats out of tinfoil and decide which variable to change first (shape).         Inferring the data and recommending a boat type and water type to answer the question based off their results.         Image: the data and recommending a boat type and water type to answer the question based off their results.         Image: the data and recommending a boat type and water type to answer the question based off their results.         Image: the data and recommending the question of the type of the data and recommending the type and water type to answer the question based off their results.         Image: the data and recommendies and the type of the data and the data and the type of the data and the type of the data and the data and the type of the data and the data and the data and the data andatan and the data and the data and the data and the data	Outdoor learning. Which surface would be most suitable? – creating friction Create a suitable graph to illustrate their findings and then articulate which path the cyclist should take if they had no brakes. Children to collate information independently – assessment opportunity - did they take repeat measures?	Venn diagram: what changes to females and males experience during puberty? - share ideas with somebody else. Children to use their annotates diagrams to fill In their venn diagram

	Share findings and ideas.	Share findings and reliability – discussion	Sharing recommendations and why these	Share findings.	Throughout after each task and during.
		based.	may vary between groups?	Discuss how groups collated information etc.	Low stakes quiz and knowledge mat
Reflect				What graph did you use? Why?	clarification.
				Validity of results – reinforce scientific term:	
				outlier.	
Find of block					

## End of block:

Concept circles and children to fill these in with what information they know about each concept: this can be in diagram form or written sentences.

Medium Term Plan: Animals including humans Cycle B Y5/6

Enquiry Type:	Working Scientifically Concepts:	Previous Scientific Vocabulary	New Scientific vocabulary
Comparative and fair testing	Asking questions	• prey	• puberty
Pattern seeking	Making observations and measuring them	• predator	• gestation
Research using secondary sources	Engaging in practical enquiry	• producer	• womb
<ul> <li>Identifying, classifying and grouping</li> </ul>	Recording and presenting evidence	• stomach	• growth
Observing over time.	Answering questions and concluding	intestines	reproduce
5	Evaluating and predicting	digestion	• sperm
	Communicating findings.		• egg foetus
			• fertilisation
Previous Learning End Point Assessment in this concept:	Previous Learning End Point Assessment in working scientif	ically concepts: End Point Assessmen	t Statements:

Previous Learning End Point Assessment in this concept:	Previous Learning End Point Assessment in working scientifically concepts:	End Point Assessme
Digestive System:	I can draw on prior knowledge to help answer a question.	Human Life Cycle
1. I can identify the basic parts of the digestive system in humans.	I can make systematic and careful observations.	1. I can identify the
2. I can describe the functions of the basic parts of the digestive system.	I can use a range of equipment for measuring length, time, temperature and capacity.	2. I can describe the
3. I can evaluate and understand how to keep the different basic parts of the digestive	I can record my measurements e.g. using tables, tally charts and bar charts (given templates	3. I can explain why
system healthy.	when needed).	wider to prepare for
4. I can identify the different types of teeth in humans and their simple functions	I can interpret the data to generate simple comparative statements based on my evidence.	
5. I can construct and interpret a variety of food chains.	I can begin to identify naturally occurring patterns and causal relationships.	
6. I can identify (from food chains) the producers, prey and predators.		

	Revisit of knowledge short Afl lesson	Lesson 1	Lesson 2	Lesson 3	Lesson 4	Lesson 5
Learning Question	What can I remember about the digestive system	What happens as humans develop to old age?	Is there a correlation between the gestation period and average lifespan of animals?	How does the foetus develop in the womb?	How does puberty change your body?	How does your body change from birth to old age?
Enquiry Type		Observing over time and research using secondary sources.	Pattern Seeking	Identifying, classifying and grouping Observing over time Research using secondary sources	Research using secondary sources	Pattern seeking Observing over time
Conceptual Knowledge	Prior units end point assessment	<ul> <li>.I can identify the changes as humans develop to old age.</li> <li>I can describe these changes.</li> <li>I can explain why these changes occur.</li> </ul>	<ul> <li>.I can identify the changes as humans develop to old age.</li> <li>I can describe these changes.</li> <li>I can explain why these changes occur.</li> </ul>	<ul> <li>.I can identify the changes as humans develop to old age.</li> <li>I can describe these changes.</li> <li>I can explain why these changes occur.</li> </ul>	<ul> <li>.I can identify the changes as humans develop to old age.</li> <li>I can describe these changes.</li> <li>I can explain why these changes occur.</li> </ul>	<ul> <li>.I can identify the changes as humans develop to old age.</li> <li>I can describe these changes.</li> <li>I can explain why these changes occur.</li> </ul>
Working Scientifically		I can record data using scientific diagrams and labels.	I can record measurements e.g. using tables, tally charts, bar charts, line graphs and scatter graphs.	I can present the same data in different ways in order to help with answering the question.	I can discuss whether other evidence e.g. from other groups, secondary sources and my scientific understanding, supports or refutes their answer.	In my conclusions, I can: identify causal relationships and patterns in the natural world from my evidence
Concept Flashback (previous phase or earlier that year)		<ul> <li>Electricity Y5/6:</li> <li><u>https://wordwall.net/resource</u> /2898861/science/electricity- vocabulary-year-6</li> <li>Draw a working circuit that would light up a single light bulb and label this.</li> <li>Define component and give an example</li> </ul>	Light Y5/6 1. <u>https://wordwall.net/res</u> <u>ource/2862597/science/light-</u> <u>quiz-year-6</u> 2. <u>https://wordwall.net/resour</u> <u>ce/2972373/science/the-</u> <u>structure-of-the-eye-year-6</u> 3. Define transparent, opaque and translucent	Forces Y5/6 1. <u>https://wordwall.net/reso</u> <u>urce/2918054/science/forces-</u> <u>vocabulary-year-5</u>	<ul> <li>Animals including humans Y3/4 (Skeleton)</li> <li>1. <u>https://wordwall.net/resour</u> ce/28877349/biology/skeleton- <u>quiz</u></li> <li>2. Define balanced diet</li> </ul>	Plants Y3/4 1. <u>https://wordwall.net/resource</u> / <u>16164020/science/flowers-revision</u> 2. Define pollination
Review/ Revisit	Low Stakes Quiz on Kahoot. Include: - digestive organs	1. Gaps in knowledge from revisit lesson to address any gaps	Image: State of the second relation o	<ol> <li>Gaps in knowledge from revisit lesson to address any gaps</li> <li>gestation period: reading a graph</li> </ol>	<ol> <li>Gaps in knowledge from revisit lesson to address any gaps</li> <li>foetal development</li> </ol>	<ol> <li>Gaps in knowledge from revisit lesson to address any gaps</li> <li>puberty and organising statements</li> </ol>

e changes as humans develop to old age e changes as humans develop to old age. y these biological changes occur (e.g. women's hips grow or pregnancy)

	- what food tyeps there are.	Throughout and secondary resources	Table and information packs.	Reading the statements when grouping	Puberty (page 19 in S2 science book)	
Read						
Teach		https://explorify.uk/en/activities/what- if/the-average-lifespan-of-a-human-was- 200 Use this link as a lesson stimulus – What happens if humans live till they are 200? Children sort pictures to show lifecycle of a human. Discuss how they knew this. Discuss bodily changes that occur during this time. Bodily changes that occur at each cycle.	What gestation periods are – teach the human gestation period and examples of different animals.	What is a feotus? How an egg is fertilised and the process of fertilisation and the moment of conception. Look at the basic develop of a foetus and recap the human gestation period.	What puberty is and the age this at. <u>Teen species</u> from www.bbc.co.uk <u>BBC puberty videos – use as</u> <u>appropriate</u> from www.bbc.co.uk <u>Adolescence</u> from www.dkfindout.com <u>Stages of puberty</u> from www.nhs.uk Talk through these resources and links. Explain biological reason for puberty (hips widen due to getting ready for pregnancy)	What happens as age. Look at some graphs and what they show about old age. <u>Nelson Mandela: a life in pictures</u> , <i>The</i> <i>Guardian</i> What changes have you noticed? Discuss these observations
Practice		Lifecycle of a human ordering. Discussion within the lesson.	Drawing the bar graph – using the information.	Group the statements into the weeks, biological changes and pictures. What happens at each stages. Challenge: what points and milestones do you think are key moments in pregnancy.	In groups annotate a blank template of a female and male body during puberty and use the videos to illustrate any changes. Magpie ideas from other groups and class share (mini reflection point).	Give each table a scenario and some information that is relevant and they are to create a card about their scenario and then one stray their ideas and show what happens as we age on different levels. Find out what happens to hair as we age Find out what happens to our skin as we age Find out what happens to our skin as we age Find out what happens to our happens to our happens to our happens to our happens to our bones as we age Find out what happens to our happens to our
Apply		In groups, children are to create a visual timeline of the human lifecycle, annotating it with key biological changes that occur. Children to have supplementary resources to aid additional research and investigation. How do human lifecycles compare to that of a chimpanzee – discussion.	Write their findings up.           Animal         Gestation (in days)         years)           Human         287         75           African elephant         640         60           Tiger         100         25           Girafte         450         25           Ohimpasse         237         45           Wolf         69         16           Gere spainel         44         6           Pig         113         13           Humster         16         3           Obg         63         12           Cat         62         2           Horse         337         20           Hampback whale         350         50           Dolphin         276         20	<ul> <li>Guide for pregnant woman about the changes and stages of pregnancy.</li> <li>what will they need to know?</li> <li>key events and weeks when these occurrences happen</li> </ul>	Venn diagram: what changes to females and males experience during puberty? - share ideas with somebody else. Children to use their annotates diagrams to fill In their venn diagram	<figure></figure>
Reflect		Share ideas and 'Magpie' any information from other groups which they might not have.	Share conclusions – if your partner makes a valid point add it to your conclusion in editing pen.	Why can a baby survive outside the womb from 26 weeks?	What if puberty didn't happen?	Share graph findings and comparisons.
End of block	What would happen to - children can p	o the human lifecycle if humans were to live to present their predications and justifications in	b be 200? a manner they see fit and appropriate.			

Medium Term Plan: Animals including humans Cycle B Y5/6

Enquiry Type:		Working Scientifically Concepts:	Previous Scientific Vocabulary	New Scientific vocabulary		
Comparative and fair testing		Asking questions	• puberty	heart	<ul> <li>capillaries</li> </ul>	
Pattern seeking		Making observations and measuring them	• gestation	• lungs	<ul> <li>oxygenated</li> </ul>	
Research using secondary sources		Engaging in practical enquiry	• womb	• cardiovascular	<ul> <li>deoxygenated</li> </ul>	
<ul> <li>Identifying, classifying and grouping</li> </ul>		Recording and presenting evidence	• growth	• veins	• transportation	
<ul> <li>Observing over time.</li> </ul>		Answering questions and concluding	• reproduce	arteries	<ul> <li>blood vessels</li> </ul>	
		Evaluating and predicting	• sperm			
		Communicating findings.	• egg foetus			
			• fertilisation			
Previous Learning End Point Assessment in this Previous Le		rning End Point Assessment in working scientifically concepts:	End Point Assessment Statements:			
concept:						
Human Life Cycle	I can draw or	n prior knowledge to help answer a question.	Circulatory and Respiratory System:			
1. I can identify the changes as humans develop to old	I can make sy	ystematic and careful observations.	1. I can identify and name the main parts of the human circulatory system (cardiovascular and respiratory)			
age	I can use a ra	ange of equipment for measuring length, time, temperature and capacity.	2. I can describe the functions of the heart, blood vessels a	and blood		
2. I can describe the changes as humans develop to old I can record		my measurements e.g. using tables, tally charts and bar charts (given templates	3. I can explain the importance of a healthy lifestyle and understand a few ways of achieving this.			
age. when needed).		4. I can recognise the impact of diet, exercise, drugs and lifestyle (e.g. sedentary lifestyle, smoking, alcohol and drug				
3. I can explain why these biological changes occur (e.g. I can interpret the data to generate simple comparative statements based on my evidence.			consumption – including caffeine) on the way their bodies function			
women's hips grow wider to prepare for pregnancy) I can begin to identify naturally occurring patterns and causal relationships.			6. I can explain the impact of an unhealthy lifestyle on human bodily function.			
7.		7. I can describe the ways in which nutrients and water are transported within animals, including humans.				

	Revisit of knowledge short Afl lesson	Lesson 1	Lesson 2	Lesson 3	Lesson 4	Lesson 5
Learning Question	What can I remember about how humans grow old?	Can you identify and name the main parts of the human circulatory system?	Can you describe the functions of the heart, blood vessels and blood?	Can you describe the ways in which nutrients and water are transported within animals including humans?	How does the length of time we exercise for affect our heart rate?	How do our lifestyle choices impact on our bodily function?
Enquiry Type		Identifying, classifying and grouping.	Identifying, classifying and grouping.	Research using secondary sources	Comparative and fair test	Pattern seeking
Conceptual Knowledge	Prior units end point assessment	I can identify and name the main parts of the human circulatory system (cardiovascular and respiratory).	I can describe the functions of the heart, blood vessels and blood.	I can describe the ways in which nutrients and water are transported within animals, including humans.	I can explain the importance of a healthy lifestyle and understand a few ways of achieving this. I can recognise the impact of diet, exercise, drugs and lifestyle (e.g. sedentary lifestyle, smoking, alcohol and drug consumption – including caffeine) on the way their bodies function I can explain the impact of an unhealthy lifestyle on human bodily function.	I can explain the importance of a healthy lifestyle and understand a few ways of achieving this. I can recognise the impact of diet, exercise, drugs and lifestyle (e.g. sedentary lifestyle, smoking, alcohol and drug consumption – including caffeine) on the way their bodies function I can explain the impact of an unhealthy lifestyle on human bodily function.
Working Scientifically		I can present the same data in different ways in order to help with answering the question.	I can talk about how scientific ideas change due to new evidence being gathered.	I can communicate my findings to an audience using relevant scientific language and illustrations.	I can select a suitable measuring method and therefore equipment to give the most precise results (e.g. ruler, tape measure or force meter). I can carry out fair tests, recognising and controlling variables. I can look for patterns and relationships using a suitable sample.	I can decide how to record and present evidence. I can talk about how scientific ideas change due to new evidence being gathered. I can communicate my findings to an audience using relevant scientific language and illustrations.
Concept flashback (prior phase or earlier in the year)		<ul> <li>Animals including humans (human life cycle) Y5/6</li> <li>1. <u>https://wordwall.net/reso</u> <u>urce/5131276/science/human-life-cycle</u></li> <li>2. Define gestation period</li> </ul>	Electricity Y5/6: 8. <u>https://wordwall.net/resource</u> <u>/2898861/science/electricity-</u> <u>vocabulary-year-6</u> 9. Draw a working circuit that would light up a four light bulbs. 10. Define voltage	Living things Y3/4: 1. <u>https://wordwall.net/res</u> <u>ource/5776745/science/living-</u> <u>things-and-their-habitats</u> 2. Define habitat	Forces Y5/6 https://wordwall.net/reso urce/2918054/science/forces-vocabulary- year-5	Light Y5/6 4. <u>https://wordwall.net/res</u> <u>ource/2862597/science/light-</u> <u>quiz-year-6</u> 5. <u>https://wordwall.net/resour</u> <u>ce/2972373/science/the-</u> <u>structure-of-the-eye-year-6</u> 6. Define optic nerve

Review/ Revisit Read	Low Stakes Quiz on Kahoot. Include: - stages. of human Lifecycle - key facts about each stage	<ol> <li>Gaps in knowledge from revisit lesson to address any gaps</li> <li>Previous lesson (order human cycle and one fact about each stage)</li> <li>Throughout and on flip for explanations</li> </ol>	<ol> <li>Gaps in knowledge from revisit lesson to address any gaps</li> <li>Previous lessons (human life cycle and label the heart)</li> <li>Throughout Quiz Definitions of others</li> </ol>	<ol> <li>Gaps in knowledge from revisit lesson to address any gaps</li> <li>Previous lessons (label the heart, functions of the heart, blood vessels and blood)</li> <li>Throughout Each other's write ups.</li> </ol>	<ol> <li>Gaps in knowledge from revisit lesson to address any gaps</li> <li>Previous lessons (label the heart, functions of the heart, blood vessels and blood)</li> <li>Independent, dependent and control variables</li> <li>Throughout Results and findings Information on taking heart rate and</li> </ol>	<ol> <li>Gaps in knowledge from revisit lesson to address any gaps</li> <li>Previous lessons</li> <li>Throughout Graphs</li> </ol>
					calculating it.	
Teach		Look at the diagram of the circulatory system and teach what each part is and how blood flows through the human body.	https://www.bbc.co.uk/bitesize/topics /zwdr6yc/articles/zs8f8mn Watch the video and complete the fill in the gaps interactive activity. Introduce children to the function of parts of the system – heart, blood and blood vessels. Look at what makes up our blood.	How nutrients and water are transported around humans.	Misconceptions in variables. Introduce the question and explore what the independent, dependent and control variables will be. How will we make this a fair test? How to find heart rate – neck or wrist. Ch to count their resting pulse/heart rate and record on their whiteboard. Count for 20 seconds and x3 for example.	Discuss what we learnt about exercise last week. Sorting activity, Discuss different 'drugs' and the impact on our bodies. Focus on smoking and look at a life expectancy.
Practice		Children to look at different diagrams and compare where each part of the human circulatory system is.	Children to generate their own definitions with a partner on whiteboards for the heart, blood vessels and blood.	Discussion. Linking to the blood vessels and prior knowledge.	Discussion. Deciding on how they will measure the LENGTH of time exercising and what exercising means – what will do they? Skipping, running, star jumps, etc.	Sort pictures into drugs and those that aren't. Why do they think this?
Apply		Using playdough children are to recreate the structure of the heart and lungs and using the different colours show deoxygenated and oxygenated blood. Children to use toothpicks and paper to then label each section of the human heart	Using a photo from last lesson with a clearly labelled heart with playdough, children are to annotate this with what they function of the heart is. Then, they will have statements about the lungs which are true and false, they need to decipher which are true and annotate their picture with this. Label which blood vessels are arteries and veins and whether they are deoxygenated or oxygenated. Challenge: annotate the composition of blood.	Draw around a person (Lifesize model) and use pencils, string and glue to recreate blood vessels. They must include the main organs involved and see if they can correctly position these on the Lifesize models. Challenge: include kidneys and intestines. Children to write up what their Lifesize model shows in their books.	Children to decide, after discussion, what they are going to investigate and then collate their recordings (independently as a group). Write a conclusion about what they find.	Focus on smoking and look at a life expectancy. Children to infer this data and what biological impact this has on the human body. How has this research impacted on society as time has moved on?
Reflect		Share ideas and explain why they have used red and blue playdough.	Orally share definitions after practice stage – address any misconceptions. Share annotated diagrams with a partner and talk them through it.		Why might heart rate differ between humans? – challenge.	Share finding and what we now know about lifestyle choices on bodily functioning. Use an 'if' question. If there were no apples If people said chcolate was healthy If calories didn't exist.