







Malpas Alport Primary School – Science Curriculum

Purpose of Study	A high-quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Science has changed our lives and is vital to the world's future prosperity, and all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational knowledge and concepts, pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes.					
Aims	<p>The national curriculum for science aims to ensure that all pupils:</p> <ul style="list-style-type: none"> develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future. 					
Curriculum Design	<p>The Malpas Alport Science Curriculum explicitly sets out the substantive and disciplinary knowledge children will learn in each lesson to ensure there is clear interplay between the types of knowledge. To support schema development, lessons are sequenced to build on prior learning with each lesson having clearly defined knowledge to revisit.</p> <p>The Malpas Alport Science curriculum is sequenced following the topics as they are set out in the National Curriculum for KS1 and KS2. At Malpas Alport, we prioritise the STEM subjects. All year groups have a STEM based topic that is covered for a full term each year. These topics make explicit links between the Design and Technology, Science and Computing curriculums.</p>					
Personal Development Links						
	RESPECT	SMSC	Rights Respecting	British Values	Jigsaw	Trips and Visits




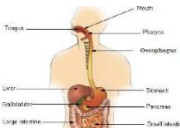
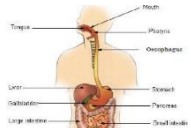
Topic Overview Year 4


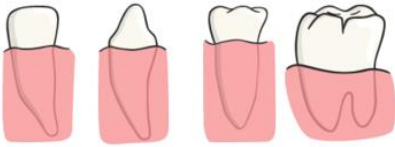
	HT1	HT2	HT3	HT4	HT5	HT6
Year 4	Animals including humans	States of matter	STEM - Electricity		Living things and their habitat	Sound

HT1 - Animals including humans


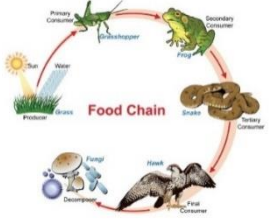
	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
Revisit of prior learning	Review that humans and animals get their nutrition from what they eat. Review the importance of eating the right amount of different types of food.	Review the names of the key parts of the digestive system.	Review the names of the key parts of the digestive system.	Review names of the different types of teeth and their functions.	Review grouping animals into fish, amphibians, reptiles, birds and mammals. Review carnivores, herbivores and omnivores.	Review carnivores, herbivores and omnivores and how we can tell an animal's diet by their teeth. Review what a food chain is from Y2.
Lesson sequence	Describe the simple functions of the basic parts of the digestive system in humans - <i>teeth, oesophagus, stomach, small/large intestines, and rectum.</i>	Describe the simple functions of the basic parts of the digestive system in humans. Intestine experiment	Identify the different types of teeth in humans and their simple functions - <i>incisors, canines, pre-molars, molars, wisdom.</i> Modelling teeth with modelling clay	Identify the different types of teeth in humans and their simple functions - investigation to show how to keep teeth healthy. Egg investigation	Investigate animal teeth and how the types of teeth can tell you about their diet.	Construct and interpret a variety of food chains, identifying producers, predators and prey.

Knowledge - Animals including humans

Substantive knowledge		Disciplinary Knowledge			
Personal Development		Knowledge of methods that scientists use to answer questions <i>(Observation over time, pattern seeking, identify/classify, comparative/fair test, research using secondary sources)</i>	Knowledge of apparatus and techniques, including measurement	Knowledge of data analysis	Knowledge of how science uses evidence to develop explanations.
1	   <p>Digestion is the way the body breaks down the food we eat into smaller parts that can be used to give the body the nutrients it needs.</p> <p>The main parts of the digestive system are – mouth, teeth, tongue, pharynx, oesophagus,</p> 	<p>Identify and classify</p> <p>To identify and classify you make observations and investigations to organise things into groups or categories.</p> <p>Know that you need to use scientific language when identifying and classifying.</p>		<p>Know that a diagram is the best way to display the workings of something.</p>  <p>A diagram is a simple drawing that shows the</p>	<p>Know that scientific evidence has been used to classify the parts of the digestive system.</p> <p>Know that an experiment will demonstrate and consolidate known facts.</p>

2		<p>stomach, gall bladder, pancreas, large intestine, small intestine,</p> <ol style="list-style-type: none"> 1. Food is put into the mouth where it is chewed. Food is swallowed and passes through the pharynx and oesophagus to the stomach. 2. In the stomach food is broken into smaller pieces and mixed with stomach acid. 3. The mixture passes into the small intestine where nutrients are absorbed into the blood stream. 4. The food that is left passes through the large intestine. 5. Waste leaves the body through the rectum. 	<p>Research Research is an investigation to establish facts about something. Know that information texts use scientific language.</p>		appearance or workings of something.	
3		<p>Types of teeth Molars/pre molars – back teeth used for crushing and grinding Canines – long pointed teeth used for ripping Incisors – sharp front teeth used for cutting</p>  <p>Incisors Canines Pre-molar Molar</p>	<p>Identify and classify To identify and classify you make observations and investigations to organise things into groups or categories.</p> <p>Research Research is an investigation to establish facts about something.</p> <p>Secondary sources are works such as textbooks, encyclopedia and scientific books. They describe, discuss and evaluate primary sources.</p> <p>Know that information texts use scientific language.</p>		<p>Know that a diagram is the best way to display the workings of something.</p> <p>A diagram is a simple drawing that is labelled.</p> <p>Modelling can be used to explain/show scientific ideas and concepts.</p>	<p>Know that scientific evidence supports the identification and classification of different teeth and their purposes.</p>
4			<p>Observation over time Observing over time is when make systematic and careful observation to identify and</p>	<p>You can measure the volume of a liquid using a measuring jug.</p>	<p>Know that you need to use scientific language when recording results.</p>	<p>To draw scientific conclusion you need to look at your results and identify patterns.</p>

			<p>measure changes in materials over a period of time.</p> <p>Regular observations/measurements need to be made at set intervals.</p> <p>You need to control the variables to limit the impact of external factors.</p> <p>You can carry out an observation over time to investigate which drinks cause the most/least damage to your teeth.</p>	 <p>The volume of a liquid is measured in millilitres and litres.</p> <p>1litre = 1000ml</p>	<p>Know that results from an observation over time can be collected and presented in a table.</p> <table border="1" data-bbox="1456 438 1758 582"> <thead> <tr> <th rowspan="2">Mass of weights/g:</th> <th colspan="2">Time/s:</th> </tr> <tr> <th>Trial 1:</th> <th>Trial 2:</th> </tr> </thead> <tbody> <tr> <td>250</td> <td>3.1</td> <td>2.9</td> </tr> <tr> <td>300</td> <td>2.5</td> <td>2.7</td> </tr> <tr> <td>350</td> <td>1.7</td> <td>1.8</td> </tr> <tr> <td>400</td> <td>1.6</td> <td>1.2</td> </tr> </tbody> </table>	Mass of weights/g:	Time/s:		Trial 1:	Trial 2:	250	3.1	2.9	300	2.5	2.7	350	1.7	1.8	400	1.6	1.2	
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5		<p>Carnivores – eat meat. They have teeth that are shaped to slice and rip. E.g. large sharp canines.</p> <p>Herbivores – eat plants. They have teeth that are shaped to squash and grind plants e.g. bumpy molars.</p> <p>Omnivores – eat meat and plants. They have both teeth that are shaped to slice and rip (e.g. canines) and teeth that are shaped to squash and grind (e.g. bumpy molars).</p> 	<p>Identifying and classifying To identify and classify you make observations and investigations to organise things into groups or categories.</p> <p>Know that you need to use scientific language when identifying and classifying.</p> <p>Research Research is an investigation to establish facts about something.</p> <p>Secondary sources are works such as textbooks, encyclopedia and scientific books. They describe, discuss and evaluate primary sources.</p> <p>Secondary sources do not give original information. It</p>		<p>Know that a diagram is the best way to display the workings of something.</p> <p>A diagram is a simple labelled drawing.</p>	<p>Know that results from a scientific enquiry can be used to answer a scientific question.</p> <p>To answer a scientific question, you should include evidence from your scientific enquiry.</p> <p>Conclude that herbivores can be recognised based on their types of teeth.</p> <p>Conclude that different teeth have different purposes both in humans and animals.</p>																	


6		<p>interprets information from primary sources.</p> <p>Know that information texts use scientific language.</p>	<p>Know that a diagram is the best way to display the workings of something.</p> <p>A diagram is a simple labelled drawing.</p>	<p>Know that scientific evidence has been used to classify different species.</p>
		<p>Food chain – a diagram that shows the transfer of energy from the energy source to the producer to the consumer.</p> <p>Energy – the property that gives humans strength.</p> <p>Producer – usually a green plant or algae that makes its own food.</p> <p>Consumer – a living thing which gets their food by eating plants or other animals.</p> <p>Predators – animals that eat other animals</p> <p>Prey – animals that are eaten by other animals.</p>  <p>Research Research is an investigation to establish facts about something.</p> <p>Secondary sources are works such as textbooks, encyclopedia and scientific books. They describe, discuss and evaluate primary sources.</p> <p>Know that information texts use scientific language.</p>		

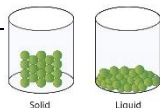
HT2 – Materials








	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
Revisit of prior learning	<p>Review appearance and simple physical properties of sedimentary, metamorphic and igneous rocks.</p> <p>Review names and types of everyday</p>	<p>Review properties of a solid and liquid and group materials into categories.</p>	<p>Review properties of a solid, liquid and gas.</p>	<p>Review properties of a solid, liquid and gas.</p>	<p>Review how some materials can change state by being heated or cooled.</p>	<p>Review parts of the water cycle.</p>

	materials, their properties and uses.					
Lesson sequence	Compare and group materials together, according to whether they are solids or liquids - define the properties of a solid and liquid.	Investigate gasses - what is a gas, what are the properties of a gas?	Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C). introduce children to how to use a thermometer.	Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C) - look at how some changes of state are reversible and some are irreversible.	Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.	Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature - carry out investigation to demonstrate different stages of the water cycle.


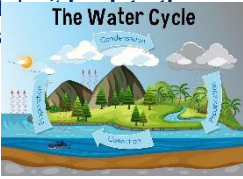
Knowledge – States of matter

Substantive knowledge		Disciplinary Knowledge			
Personal Development		Knowledge of methods that scientists use to answer questions <i>(Observation over time, pattern seeking, identify/classify, comparative/fair test, research using secondary sources)</i>	Knowledge of apparatus and techniques, including measurement	Knowledge of data analysis	Knowledge of how science uses evidence to develop explanations.
1	 <p>Solid: They keep their shape unless force is applied. They take up the same amount of space and do not spread out or flow (e.g. wood, metal, chocolate, rice)</p> <p>Liquid: They can change shape but do not change their volume. They take the shape of the container they are in. Can be poured (e.g. water, orange juice, honey)</p>	<p>Identify and classify</p> <p>To identify and classify, you make observations and measurements to find similarities and differences. This help to organise things into groups and make connections.</p> <p>Know that you need to use scientific language when identifying and classifying.</p>		Know that a table is the best way to present the results when you identify and classify.	To draw a scientific conclusion you need to look at your results and identify patterns.



<p>2</p> 	<p>Gas: They spread out to completely fill the shape they are in. They do not keep their shape and can be squashed (e.g. air, helium, water vapour).</p> 	<p>Research Research is an investigation or study to find out facts in order to reach a conclusion.</p> <p>Know that information texts use scientific language.</p>	<p>A measuring jug is used to measure the volume of liquid. A milliliter is a unit of volume.</p> <p>1 litre = 1000ml</p> <p>Scales measure the weight of something.</p> <p>Grams is a unit of measure for weight.</p> <p>1kg = 1000g</p>	<p>Know that you can present information from research in a table to make it clearer and easier to understand.</p>	<p>Know that scientific evidence has been used to classify solids, liquids and gasses.</p>
<p>3</p> 	<p>Some materials change state when they are heated or cooled. When water (liquid) is <i>heated</i> it changes to water vapour (gas). When it is <i>cooled</i> it changes to ice (solid). When solid chocolate is heated, it melts and when it is cooled it changes back to a solid. Water changes to a gas at 100°C (Celsius) Water changes to a solid at 0°C.</p> 	<p>Observation over time Observing over time is when you make systematic and careful observation to identify and measure changes in materials over a period of time.</p>	<p>A thermometer is an instrument that measures temperature. The degree Celsius is a unit of temperature.</p>  <p>A stopwatch measures the amount of time that has passed.</p>  <p>Time can be measured in: hours, minutes, seconds and milliseconds.</p>	<p>Know that results from an observation over time can be collected and presented in a table.</p> <p>Know that you need to use scientific language when reporting results.</p>	<p>To draw a scientific conclusion you need to look at your results and identify patterns.</p> <p>To answer a scientific question, you should include evidence from your scientific enquiry.</p>
<p>4</p> 	<p>Some changes of state are reversible (can change back to its original state) and some are irreversible (can't change back to its original state).</p>	<p>Observation over time Observing over time is when you make systematic and careful observation to identify and measure changes in</p>	<p>A thermometer is an instrument that measures temperature. The degree Celsius is a unit of temperature.</p>	<p>Know that results from an observation over time can be collected and presented in a table.</p>	<p>To draw a scientific conclusion you need to look at your results and identify patterns.</p>




			materials over a period of time.	A stopwatch measures the amount of time that has passed. Time can be measured in: hours, minutes, seconds and milliseconds.	A line graph is a graph that shows changes over time.	
5 6		<p>Water on Earth is constantly moving. It is recycled over and over again. This recycling process is called the water cycle.</p> <p>Evaporation - The sun heats up water on land, in rivers, lakes and seas and turns it into water vapour. The water vapour rises into the air.</p> <p>Condensation - Water vapour in the air cools down and changes back into tiny drops of liquid water, forming clouds.</p> <p>Precipitation - The clouds get heavy and water falls back to the ground in the form of rain or snow.</p> <p>Collection - Rain water runs over the land and collects in lakes or rivers, which then flows back to the sea. The cycle starts again.</p> 	<p>Identifying/classifying To identify and classify, you make observations and measurements to find similarities and differences. This help to organise things into groups and make connections.</p> <p>Know that you need to use scientific language when identifying and classifying.</p> <p>Research Research is an investigation or study to find out facts in order to reach a conclusion.</p>	<p>A ruler is a tool used to measure length.</p> <p>A centimeter is a unit of measurement. 1cm = 10mm</p> <p>A measuring jug is used to measure the volume of liquid. A milliliter is a unit of volume. 1 litre = 1000ml</p>		To draw a scientific conclusion you need to look at your results and identify patterns.


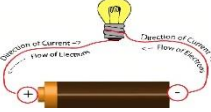



HT3 and HT4 – Electricity











Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
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Revisit of prior learning		Review the difference between mains and battery power.	Review how to make a simple series circuit. Review names of electrical components.	Review names and properties of everyday materials. Review electrical safety.	Review how to make a simple series circuit and that it needs to be complete for the bulb to light. Review conductors and insulators.	Review that a switch opens and closes a circuit.
Lesson sequence	Identify common appliances that run on electricity. Look at the difference between mains and battery powered appliances. Look at how to keep safe around electricity.	Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers.	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.	Recognise some common conductors and insulators, and associate metals with being good conductors. Look at everyday uses of conductors and insulators and consider why these materials are used. E.g. plastic around a plug.	Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit.	Investigate different types of switches depend on the purpose e.g. light switch, safety switch for lawn mower.



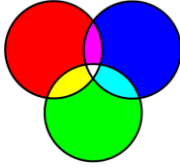


Knowledge – Electricity (STEM topic – F1 cars)








Substantive knowledge		Disciplinary Knowledge			
Personal Development		Knowledge of methods that scientists use to answer questions <i>(Observation over time, pattern seeking, identify/classify, comparative/fair test, research using secondary sources)</i>	Knowledge of apparatus and techniques, including measurement	Knowledge of data analysis	Knowledge of how science uses evidence to develop explanations.
1	 <p>Many household devices and appliances run on electricity: e.g. washing machine, television, toaster, and kettle. Some devices run on batteries others need mains power to work.</p>	<p>Identifying and classifying To identify and classify, you make observations and measurements to find similarities and differences. This help to organise things into groups and make connections.</p> <p>You can classify electrical appliances in ones that are mains powered and ones that are battery powered.</p>		<p>A Venn diagram is a clear way to present findings from an identifying and classifying enquiry.</p> <p>A Venn diagram uses circles to show the relationship between things. Items placed in the cross over between the circles show that they fit into both categories.</p>	




2		<p>A simple series electrical circuit allows a flow of current through each component. The parts of a circuit can be named, including cells, wires, bulbs, switches and buzzers.</p> 	<p>Identify Identifying means that you find out what something is.</p> <p>You can identify the parts of an electrical circuit.</p>	<p>Wires, batteries, bulbs, buzzers and motors are electrical components that make up a circuit.</p> 		
3	 	<p>Electricity will flow if there is a complete circuit, a bulb will light up if there is no break in the circuit.</p>	<p>Pattern seeking Pattern seeking is when you observe variables that cannot be controlled to notice patterns.</p> <p>Variables are anything that can change or be changed.</p> <p>You can carry out a pattern seeking enquiry to investigate what is needed to ensure the bulb will light in an electrical circuit.</p> <p>You can make predictions about what patterns you might find before carrying out a pattern seeking enquiry.</p>	<p>Wires, batteries, bulbs, buzzers and motors are electrical components that make up a circuit.</p>	<p>When you collect data it needs to be presented in a way that is clear and easy to understand.</p> <p>Know that results from a pattern seeking enquiry can be presented clearly in a table.</p> <p>A diagram is a picture that is usually labelled.</p> <p>You can draw a diagram to show the parts of an electrical circuit.</p>	<p>Know that results from a scientific enquiry can be used to answer a scientific question.</p> <p>To answer a scientific question, you should include evidence from your scientific enquiry.</p> <p>Conclude that you need a complete electrical circuit for the bulb to light. If there is a break in the circuit, the bulb will not light.</p>

<p>4</p>		<p>Electricity passes easily through metals, such as copper, iron and steel. These are called conductors.</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> steel</div> <div style="text-align: center;"> copper</div> <div style="text-align: center;"> gold</div> </div> <p>Electricity does not pass through plastic, glass or rubber. They are called insulators and are used to cover metals that carry electricity to prevent electric shocks.</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> Glass</div> <div style="text-align: center;"> Rubber</div> <div style="text-align: center;"> Plastic</div> </div>	<p>Identifying and classifying To identify and classify, you make observations and measurements to find similarities and differences. This help to organise things into groups and make connections.</p> <p>You can sort common every day materials into conductors and insulators.</p> <p>Comparative test A comparative test is when you test and compare different cases and situations.</p> <p>You can set up a comparative test to see if a material conducts electricity or not.</p> <p>Using existing knowledge, you can make a prediction about what the outcome of your scientific enquiry will be.</p>	<p>Wires, batteries, bulbs, buzzers and motors are electrical components that make up a circuit.</p> <p>You can use crocodile clips to put materials within a circuit to test if they are conductors or insulators.</p>	<p>Know that a table is the best way to present the results when you identify and classify.</p>	<p>Know that results from a scientific enquiry can be used to answer a scientific question.</p> <p>To answer a scientific question, you should include evidence from your scientific enquiry.</p> <p>Know that conclusions drawn from scientific enquires can be used to make recommendations such as how to keep safe around electrical equipment in the home.</p>
<p>5</p>		<p>An open switch means a circuit is incomplete. This means that an electrical current will not flow and the lamp will not light up. When the switch is closed, the circuit is complete and therefore the electrical current can flow through the circuit and the bulb can light.</p> <div style="display: flex; flex-direction: column; align-items: center;"> <div style="text-align: center;"> Closed Switch</div> <div style="text-align: center;"> Open Switch</div> </div>	<p>Pattern seeking Pattern seeking is when you observe variables that cannot be controlled to notice patterns.</p> <p>Variables are anything that can change or be changed.</p> <p>You can carry out a pattern seeking enquiry to find out that a switch breaks a circuit and therefore the bulb will light/not light when the switch is open/closed.</p>	<p>Wires, batteries, bulbs, buzzers and motors are electrical components that make up a circuit.</p> <p>You can use crocodile clips to put a switch in a circuit.</p>	<p>When you collect data it needs to be presented in a way that is clear and easy to understand.</p> <p>Know that results from a pattern seeking enquiry can be presented clearly in a table.</p>	<p>Know that results from a scientific enquiry can be used to answer a scientific question.</p> <p>Know that results from a scientific enquiry can be used to make recommendations or suggest improvements.</p>

	6			<u>Pattern seeking</u> Children to apply knowledge of switches, conductors and insulators to make switches that are fit for different purposes.		
HT5 - Living things and their habitat						
	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
Revisit of prior learning	Review the differences between things that are living/ dead / have never been alive.	Review characteristics of living things (MRS GREN). Review names of common plants and animals.	Review different types of vertebrate.	Review how living things can be grouped in a variety of ways. Review names of common plants and animals.	Review how to use a classification key to identify and group living things. Review that most living things live in habitats to which they are suited and that different habitats provide for the basic needs of the living thing.	Review that living things live in habitats that provide their basic needs. Review that environments can change.
Lesson sequence	Recognise the characteristics of a living thing - movement, respiration, sensitivity, growth, reproduction, excretion, nutrition (MRS GREN). Children to tour local area and collect examples of living and non-living things.	Recognise that living things can be grouped in a variety of ways. Vertebrate/invertebrate. Explore different types of vertebrates. Fish/ amphibian/ reptile/ mammal/ bird. Children to group animals into vertebrates and invertebrates using their knowledge of the definitions. Split them into land and sea.	Children to investigate different types of invertebrate.	Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment Children to use a classification key to classify animals in our local environment.	Recognise that environments can change and that this can sometimes pose dangers to living things - investigate natural changes e.g. seasons.	Recognise that environments can change and that this can sometimes pose dangers to living things - investigate human changes and how these can be both positive and negative (e.g. protecting endangered species/ deforestation). Children to research how humans have a positive and negative effect on the environment. Children to report findings in a table of how to help/ how to damage the environment
Knowledge – Living things and their habitat						
	Substantive knowledge			Disciplinary Knowledge		

Personal Development		Knowledge of methods that scientists use to answer questions <i>(Observation over time, pattern seeking, identify/classify, comparative/fair test, research using secondary sources)</i>	Knowledge of apparatus and techniques, including measurement	Knowledge of data analysis	Knowledge of how science uses evidence to develop explanations.
1	 <p>Something is living if it has the following characteristics: movement, respiration, sensitivity, growth, reproduction, excretion, nutrition (MRS GREN).</p> 	<p>Identify and classify An observation is when something is closely observed or monitored.</p> <p>Classifying is when something is grouped or ordered into categories based on properties or criteria.</p>		<p>Presenting data in a Venn diagram shows the similarities and differences between organisms.</p> 	
2	 <p>Animals can be categorised as vertebrate (back bone) and invertebrate (no back bone).</p> <p>Vertebrate – animals with a back bone Bird – e.g. penguin, owl, ostrich Fish – e.g. tuna, shark, pike</p> <p>Mammal – e.g. dolphin, whale, human Reptile – e.g. snake, crocodile, turtle Amphibian – e.g. toad, salamander, frog</p> <p>Vertebrates can live on both land and in the sea.</p>	<p>Classifying Classifying is when something is grouped or ordered into categories based on properties or criteria.</p> <p>Research using secondary sources Secondary sources are works such as textbooks, encyclopedia and scientific books. They describe, discuss and evaluate primary sources.</p>		<p>Know that a table is a way to present the results when you identify and classify.</p>	
3	 <p>Invertebrate – animals without a backbone</p> <p>Worms – e.g. earthworm, leech Arthropods – e.g. spiders, ants, butterfly Molluscs – e.g. snail, squid, octopus Flatworm – e.g. flat worm, tape worm</p>	<p>Classifying Classifying is when something is grouped or ordered into categories based on properties or criteria.</p> <p>Research using secondary sources</p>		<p>Know that a table is a way to present the results when you identify and classify.</p>	<p>Know that findings from enquires can be reported in different ways e.g. orally, written, results presentation or as a conclusion.</p> <p>Know that scientific language should be used when explaining findings.</p>

		Echinodermata – e.g. starfish, sea urchin	Secondary sources are works such as textbooks, encyclopedia and scientific books. They describe, discuss and evaluate primary sources.			
4		<p>A classification key is a tool that uses yes and no questions.</p> <p>Physical characteristics are the features and traits of an organism's body.</p> 	<p>Identifying/ classifying To identify and classify, you make observations and measurements to find similarities and differences. This help to organise things into groups and make connections.</p>		<p>A classification key is a series of questions that determine an organisms physical characteristics.</p> 	
5	  	<p>How environments change Habitats can change throughout the year (seasons) and this can have an effect on the plants and animals living there.</p> 	<p>Research using secondary sources Secondary sources are works such as textbooks, encyclopedia and scientific books. They describe, discuss and evaluate primary sources.</p> <p>Pattern seeking Pattern seeking is when you observe variables that cannot be controlled to notice patterns. Variables are anything that can change or be changed.</p> <p>A timeline shows the chronological order of a period of time.</p>		<p>Information can be presented on a timeline to show how things were at different intervals of time.</p>	<p>Know that results from a scientific enquiry can be used to answer a scientific question.</p> <p>To answer a scientific question, you should include evidence from your scientific enquiry.</p>

6	  	<p><u>Human changes to the environment</u> Humans can have positive effects on the environment, e.g. nature reserves, but instead often damage it.</p> <p>Man-made Threats to the Environment Air-pollution from cars, e.g. carbon monoxide, and the burning of fossil fuels.</p> <ul style="list-style-type: none"> - Water pollution through industrial waste and farm fertilisers that can pollute rivers and streams. - Deforestation – cutting down large areas of forest to clear space for building and farming - Global warming <p>Rubbish—Plastic and household waste ends up on the streets, in the sea or in rubbish dumps, destroying habitats and wildlife.</p>	<p><u>Research using secondary sources</u> Secondary sources are works such as textbooks, encyclopedia and scientific books. They describe, discuss and evaluate primary sources.</p>		<p>Know that you can present information from research in a table to make it clearer and easier to understand.</p>	<p>Know that findings from enquires can be reported in different ways e.g. orally, written, results presentation or as a conclusion.</p>
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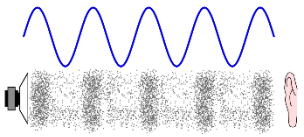



HT6 - Sound

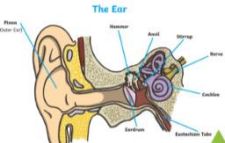

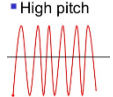
Lesson sequence









	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
Revisit of prior		Review how sounds are made and how they are associated with something vibrating.	Review term pitch from music curriculum.	Review the term volume from the music curriculum.	Review volume and how this relates the strength of the vibrations.	Review volume and how this relates the strength of the vibrations.

Lesson sequence	Identify how sounds are made, associating some of them with something vibrating	Recognise that vibrations from sounds travel through a medium to the ear. Look at how sounds travel through the ear.	Find patterns between the pitch of a sound and features of the object that produced it.	Find patterns between the volume of a sound and the strength of the vibrations that produced it.	Investigate how to muffle a sound. (Use sound metres to take measurements).	Recognise that sounds get fainter as the distance from the sound source increases.

Knowledge - Sound

Substantive knowledge		Disciplinary Knowledge			
Personal Development		Knowledge of methods that scientists use to answer questions <i>(Observation over time, pattern seeking, identify/classify, comparative/fair test, research using secondary sources)</i>	Knowledge of apparatus and techniques, including measurement	Knowledge of data analysis	Knowledge of how science uses evidence to develop explanations.
1	  Recognise that vibrations from sounds travel through a medium to the ear. 	<u>Identifying/ classifying</u> To identify and classify, you make observations and measurements to find similarities and differences. This help to organise things into groups and make connections. <u>Comparative test</u> A scientific enquiry is carried out to answer a scientific question		Know that a table is the best way to present the results when you identify and classify.	Know that results from a scientific enquiry can be used to answer a scientific question.
2	   How sounds travel through the ear: 1. A wave of vibrations enter the ear and travel to the eardrum . 2. The eardrum vibrates and sends the vibrations to the three tiny bones in the ear (malleus, incus and stapes). 3. The bones amplify the vibration and send it to the cochlea .	<u>Comparative test</u> A comparative test is when you test and compare different cases and situations. A variable is a factor that can change.	A ruler is a tool used to measure length. A centimeter is a unit of measurement. 1cm = 10mm	Know that you need to use scientific language when reporting results. Modelling can be used to explain/show scientific ideas and concepts.	Know that a conclusion is when you answer a question using what you have found out in scientific enquiry. Know that results from a scientific enquiry can be used to answer a scientific question.

		<p>4. The cochlea is filled with fluid and tiny hairs that bump into each other and an electrical impulse is created. 5. The impulse sends a message to the brain via the auditory nerve and is understood as sounds.</p> <p>Parts of the ear: Anvil, stirrup and hammer – the three small bones in the ear. Cochlea – in the inner ear, translates vibrations to electrical signals. Ear drum – a thin sheet of skin- like tissue stretch ed tight (like a drum) between the ear canal and the middle ear.</p> 	<p><u>Research using secondary sources</u> Secondary sources are works such as textbooks, encyclopedia and scientific books. They describe, discuss and evaluate primary sources.</p>			
3		<p>Pitch of a sound The pitch of a sound is how high or low it is.</p> <p>The shorter the object the higher the pitch.</p> <p>The longer the object the lower the pitch.</p> <p>With stringed instruments, the tighter the string the higher the pitch of the sound.</p> 	<p><u>Comparative/fair test</u> A comparative test is when you test and compare different cases and situations.</p> <p>A scientific enquiry is carried out to answer a scientific question</p> <p><u>Pattern seeking</u> You can make predictions about what patterns you might find before carrying out a pattern seeking enquiry.</p>		<p>Know that you can present information from research in a table to make it clearer and easier to understand.</p>	<p>Know that a conclusion is when you answer a question using what you have found out in scientific enquiry.</p>
4		<p>Volume of a sound The louder the sound, the bigger the vibration. The size of the vibration is called the amplitude. Quieter sounds have a</p>	<p><u>Pattern seeking</u> Pattern seeking enquiries can help explain the relationship between volume</p>	<p>A tuning fork makes a sound at a consistent pitch when you set it vibrating.</p>	<p>A diagram is a picture that is usually labelled.</p>	<p>Know that findings from enquiries can be reported in different ways e.g. orally, written, results presentation or as a conclusion.</p>

5	 	<p>smaller amplitude and louder sounds have a bigger amplitude.</p> 	<p>and distance of sound source. You can make predictions about what patterns you might find before carrying out a pattern seeking enquiry.</p> <p>Comparative/fair test A fair test is when one variable is hanged and the others stay the same.</p> <p>A comparative test is when you test and compare different cases and situations.</p> <p>A scientific enquiry is carried out to answer a scientific question.</p> <p>Using existing knowledge, you can make a prediction about what the outcome of your scientific enquiry will be.</p>	 <p>Force is the strength of a physical action or movement.</p> <p>A sound meter measures the volume of sound in decibels.</p> 	<p>Know that you need to use scientific language when reporting results.</p>	
		<p>A bar chart is a graph that presents categorical data.</p> <p>Know that you need to use scientific language when reporting results.</p> <p>Know that you can present information from research in a table to make it clearer and easier to understand.</p>	<p>To answer a scientific question, you should include evidence from your scientific enquiry.</p> <p>Know that you can gather, record and present data in a variety of ways to help answer questions.</p> <p>To draw a scientific conclusion you need to look at your results and identify patterns.</p>			
6	 	<p>The closer you are to the source of a sound, the louder the sound will be. The further away you are from the source of a sound, the quieter the sound will be.</p>	<p>Pattern seeking Pattern seeking enquiries can help explain the relationship between volume and distance of sound source. You can make predictions about what patterns you might find before carrying out a pattern seeking enquiry.</p> <p>Comparative/fair test</p>	<p>A sound meter measures the volume of sound in decibels.</p>  <p>A meter ruler is used to measure distance.</p> <p>A meter is a unit of measurement. 100cm = 1m</p>	<p>Know that you can present information from research in a table to make it clearer and easier to understand.</p> <p>A line graph is a graph that shows changes over time.</p>	<p>Know that you can gather, record and present data in a variety of ways to help answer questions.</p> <p>To draw a scientific conclusion you need to look at your results and identify patterns.</p>

				<p>A fair test is when one variable is hanged and the others stay the same.</p> <p>A comparative test is when you test and compare different cases and situations.</p> <p>A scientific enquiry is carried out to answer a scientific question.</p> <p>Using existing knowledge, you can make a prediction about what the outcome of your scientific enquiry will be.</p>			
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