







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 5


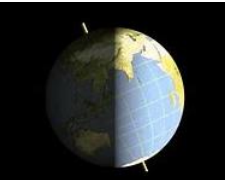



	HT1	HT2	HT3	HT4	HT5	HT6
Year 5	Space	Properties and changes of materials	STEM - Forces		Living things and their habitat	Animals including humans

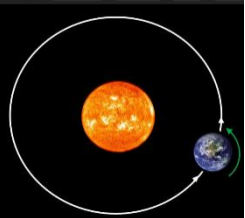



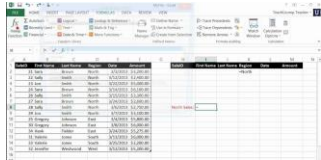


HT1 - Space




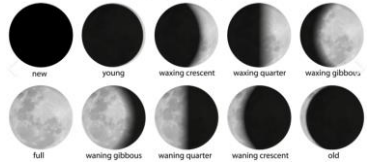
	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
Revisit of prior learning	Review the sun being a light source and that it is dangerous to look directly at it.	Review that the Earth's rotation in 24 hours is what causes day and night. Review how that shadows are formed when the light from a light source is blocked.	Review work on seasonal change and how the weather and length of the day are different depending on the time of the year.	Review how the Earth moves relative to the sun.	Review the planets in the solar system. Review the sun and earth being spherical bodies.	Review how the moon orbits the Earth in one month. Review how light is reflected from different surfaces.
Lesson sequence	Describe the Earth and sun as spherical bodies. Use the idea of the Earth's rotation to explain night and day.	Use the idea of the Earth's rotation to explain night and day and the apparent movement of the sun across the sky - shadow investigation.	Describe the movement of the Earth relative to the sun.	Look at the planets in our solar system and how they orbit around the sun.	Describe the moon as a spherical body. Describe the movement of the moon relevant to the Earth.	Look at the phases of the moon. Understand that the moon is not a source of light and that we can see it because it reflects light from the sun.

Knowledge – Earth and Space

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>Planet Earth Earth is a spherical body.</p> <p>It takes 24 hours for Earth to complete one full rotation on its axis.</p> 	<p>Research Research is an investigation or study to find out facts in order to reach a conclusion.</p> <p>Secondary sources are works such as textbooks, encyclopaedia and scientific books. They describe, discuss and evaluate primary sources.</p>			Know that scientific evidence has been used to prove that the Earth and sun are spherical bodies.

			<p>Know that information texts use scientific language.</p>		
<p>2</p>		<p>Day and night It is daytime on the side of the earth that is facing the sun and night time on the side of the earth that is facing away from the sun. As the earth rotates on its axis, shadows that are formed change in size and direction.</p> 	<p>Observations over time Observing over time is when make systematic and careful observation to identify and measure changes in materials over a period of time.</p> <p>Regular observations/measurements need to be made at set intervals.</p>	<p>A ruler is a tool used to measure length and centimeters (cm) and millimeters (mm) are units of measure.</p> <p>1cm = 10mm</p>  <p>Know that results from an observation over time can be collected and presented in a table.</p> <p>A line graph is a graph that shows changes over time.</p>  <p>Scientific language is used when presenting your results</p>	<p>To draw a scientific conclusion you need to look at your results and identify patterns.</p> <p>To answer a scientific questions you should include evidence from your scientific enquiry.</p>
<p>3</p>		<p>The Sun The Sun is a star at the centre of our solar system.</p> <p>The Earth takes 364¼ days to orbit the sun.</p> <p>An orbit is the path taken by a body circling around another body.</p> <p>Seasons</p> <ul style="list-style-type: none"> - Earth rotates on an axis. - During the winter, the North Pole is tilted away from the Sun's rays. - As Earth travels around the Sun, the tilt of Earth changes. - By June, the North Pole is tilted towards the Sun and the days become very long. <p>Earth takes a year to orbit the Sun and it is the tilt which creates the seasons.</p>	<p>Research Research is an investigation or study to find out facts in order to reach a conclusion.</p> <p>Secondary sources are works such as textbooks, encyclopaedia and scientific books. They describe, discuss and evaluate primary sources.</p> <p>Know that information texts use scientific language.</p>		<p>To answer a scientific question, you should include evidence from your research.</p>

					
<p>4</p>	 	<p>Planets There are 8 planets in our solar system: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune. The solar system consists of the sun and everything that orbits around it.</p> 	<p>Research Research is an investigation or study to find out facts in order to reach a conclusion.</p> <p>Secondary sources are works such as textbooks, encyclopaedia and scientific books. They describe, discuss and evaluate primary sources.</p> <p>Know that information texts use scientific language.</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>Results from identifying and classifying can be collected and presented in a database.</p> 	<p>To answer a scientific question, you should include evidence from your research.</p>
<p>5</p>	 	<p>The Moon The Moon is a spherical body.</p> <p>The Moon orbits the Earth. It orbits in an anti-clockwise direction and takes 28 days to complete it.</p>	<p>Research Research is an investigation or study to find out facts in order to reach a conclusion.</p> <p>Secondary sources are works such as textbooks, encyclopaedia and scientific books. They describe,</p>		<p>Know that scientific evidence has been used to prove that the moon is a spherical bodies.</p>

6	  	<p>The Moon The Moon has different phases depending on where it is in its orbit.</p> <p>The phases of the moon are: New Moon, waxing crescent, half moon, waxing gibbous, full Moon, waning gibbous, half moon, and waning crescent.</p> 	<p>discuss and evaluate primary sources.</p> <p>Know that information texts use scientific language.</p>	<p>Research Research is an investigation or study to find out facts in order to reach a conclusion.</p> <p>Secondary sources are works such as textbooks, encyclopaedia and scientific books. They describe, discuss and evaluate primary sources.</p> <p>Know that information texts use scientific language.</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>Results from identifying and classifying can be collected and presented in a table.</p>	<p>Know that scientific evidence has been used to prove that the moon has different phases.</p>

HT2 - Properties and changes of materials

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
Revisit of prior learning	<p>Review how the Earth is made of many layers including rocks and soil.</p> <p>Review appearance and simple physical properties of sedimentary, metamorphic and igneous rocks.</p>	<p>Review properties of everyday materials.</p> <p>Review common uses for everyday materials.</p> <p>Review why certain materials that are insulator/conductors are selected for specific uses.</p>	<p>Review process of evaporation.</p>	<p>Revisit what is a solid, liquid and gas.</p> <p>Revisit how to separate a mixture using filtering, sieving or evaporating.</p>	<p>Review changes of state and reversible changes.</p> <p>Review what happens when you dissolve/mix.</p>	<p>Review changes of state and reversible/irreversible changes.</p>

	Review properties of everyday materials. Review conductors and insulators. Review what a magnet is and the force					
Lesson sequence	Compare and group together everyday materials on the basis of their properties, including their hardness, transparency, conductivity (electrical and thermal), and response to magnets.	Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic	Know that some materials will dissolve in liquid to form a solution. Investigate how to recover a substance from a solution using sieving, filtering or evaporation.	Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.	Demonstrate that dissolving and mixing are changes of state and are reversible changes.	Investigate /observe how some changes result in the formation of new materials, and that this kind of change irreversible, including changes associated with burning and the action of acid on bicarbonate of soda.

Knowledge – Properties and changes of materials

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



Hardness – how hard or soft a material is.
Permeable – a material that allows liquids or gasses to pass through.
Transparent – a material that allows light to pass through.
Opaque – a material you cannot see through
Translucent – a material that allows light but not detailed shapes to pass through.

Electrical conductor – allows electricity to pass through easily.
Electrical insulator – does not allow electricity to pass through easily.
Magnetic – a material that is attracted to a magnet.
Uses of everyday materials:

Windows – made from glass because it is hard and transparent.
Oven gloves – made from a thermal insulator to keep heat from burning our hands.
Plugs – have a plastic case because plastic is an electrical insulator so stops electricity from passing through to our bodies.









Identifying and classifying
Classifying is when something is grouped or ordered into categories based on properties or criteria.




A magnet is an object that has a magnetic field. A magnet attracts and repels other items.



Know that a table is a simple way to present data collected in an investigation.

Know that scientific language should be used when explaining findings.

2	 	<p>Thermal conductor – allows heat to travel through it easily.</p> <p>Thermal insulator – does not allow heat to travel through easily.</p>	<p>Observation over time Observing over time is making systematic and careful observation to identify and measure changes in materials over a period of time.</p> <p>Regular observations/measurements need to be made at set intervals.</p> <p>External factors may affect results.</p> <p>Variables are anything that can change or be changed.</p> <p>You need to control the variables to limit the impact of external factors.</p>	<p>A thermometer is an instrument that measures temperature.</p>  <p>Degree Celsius is a unit of measure for temperature.</p> <p>You need to read the scale to see what the temperature is.</p>	<p>Know how to draw a table as a simple way to present data collected in an investigation.</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 a conclusion is when you answer a question using what you have found out in your scientific enquiry.</p> <p>To draw a scientific conclusion you need to look at your results and identify patterns</p> <p>Know that conclusions drawn from scientific enquires can be used to make recommendations.</p>
3	 	<p>Dissolve – when a solid mixes with a liquid and a solution is formed.</p> <p>Soluble – a substance that will dissolve in a liquid.</p> <p>Insoluble – a substance that will not dissolve in a liquid.</p> <p>Mixture - is a substance made by combining two or more different materials.</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>Know that a table is a simple way to present data collected in an investigation.</p>	<p>Know that results from a scientific enquiry can be used to answer a scientific question.</p>
4		<p>Sieving – you can separate smaller particles from larger particles using a sieve. Smaller particles will fall through the holes.</p>	<p>Identifying and classifying Classifying is when something is grouped or ordered into categories based on properties or criteria.</p>	<p>A sieve has a wire mesh that can be used to separate larger particles from smaller particles.</p>	<p>A diagram is a picture that is usually labelled.</p>	<p>Know that findings from enquires can be reported in different ways e.g. orally, written, results presentation or as a conclusion.</p>
5		<p>Filtering – insoluble/undissolved particles can be removed from a liquid by passing it through filter paper.</p> <p>Evaporation – when a liquid changes to a gas after being heated.</p>		 <p>Filter paper is a permeable paper that allows liquid to pass through. It can be used</p>	<p>You can use an iPad to take photographs to record changes.</p>	<p>Know that scientific language should be used when explaining findings.</p>



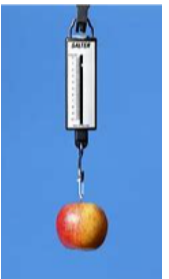
				<p>to separate fine solid particles from liquids. To use filter paper you fold it and put it inside a funnel.</p>  <p>A funnel has a wide opening at the top and a tube at the bottom. It is used to guide liquid into a small opening.</p> 		
6		<p>Reversible - changes that are not permanent. Dissolving, mixing, melting, freezing are reversible changes. E.g. water turning to ice or steam, chocolate melting and cooling.</p> <p>Irreversible - Changes that are permanent and cannot be undone. Result in the making of a new material. E.g. baking a cake, toasting bread.</p> <p>Some changes result in the formation of new material and this kind of change is usually irreversible. E.g. wood burning, vinegar mixed with bicarbonate of soda (produces carbon dioxide bubbles).</p>		<p>A diagram is a picture that is usually labelled.</p> <p>A diagram is a picture that is usually labelled.</p>	<p>Know that results from a scientific enquiry can be used to answer a scientific question.</p> <p>Know that scientific language should be used when explaining findings</p>	








HT3 and HT4 - Forces

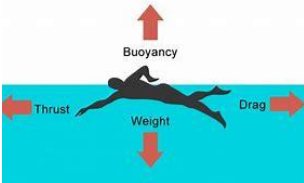





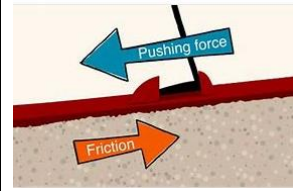

	Week 1 & 2	Week 3	Week 4	Week 5 & 6	Week 7	Week 8
Revisit of prior	Review what a force is. Review that some forces need contact and others can act from a distance.	Review work on aerodynamics from y4 F1 topic.	Review concept of air resistance and what happens when this is greater/smaller.	Review concept of friction	Review a force as a push or pull to make something move.	Review how levers and pulleys work and allow a smaller force to have a greater effect.

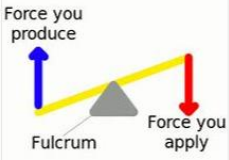

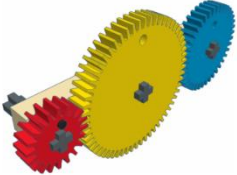
	Review magnets as having two poles. Review that magnets create two forces - attract and repel.					
Lesson sequence	Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object	Identify the effects of water resistance between moving surfaces.	Identify the effects of air resistance between moving surfaces.	Identify the effect of friction between moving surfaces.	Investigate levers and pulleys and understand that they allow a smaller force to have a greater effect.	Investigate how gears work and how they too allow a smaller force to have a greater effect.

Knowledge – Forces (STEM topic – Hover crafts)

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>A force is a push or a pull that causes an object to move faster or slower, stop, change direction or change size or shape.</p> <p>Gravity is the name of the force which pulls everything down towards the centre of the Earth.</p> 	<p>Researching using secondary sources Research is an investigation or study to find out facts in order to reach a conclusion.</p> <p>Secondary sources are works such as textbooks, encyclopaedia and scientific books. They describe, discuss and evaluate primary sources.</p> <p>Know that information texts use scientific language.</p> <p>You can use secondary sources of information to investigate why an unsupported object falls to</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 scientific evidence has been used to prove the theory of gravity.</p>

			the ground (Isaac Newton's theory).			
2	 	<p>Mass is the amount of matter or substance that makes up an object.</p> <p>Weight is the measure of the force of gravity.</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>Pattern seeking enquires can help explain scientific phenomena e.g. the relationship between weight and mass.</p>	<p>We measure the size of a force in newtons using a newton metre.</p>  <p>We measure mass in g/kg using electronic scales.</p> <p>1kg = 1000g.</p> 	<p>Know that a table is a simple way to present data collected in a pattern seeking investigation.</p> <p>Know how to draw a table as a simple way to present data.</p>	<p>Know that results from a scientific enquiry can be used to answer a scientific question.</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>A causal relationship is when one thing is responsible for causing the occurrence of another thing.</p> <p>Know that results from scientific enquires might have different degrees of trust as external factors may impact on results.</p>
3	 	<p>Water resistance is a type of friction between water and another material. E.g. when a boat sails through a body of water, water particles hit the boat making it more difficult for it to move through the water.</p>	<p>Comparative testing A comparative test is when you test and compare different cases and situations.</p> <p>A variable is a factor that can change.</p> <p>A comparative test can be carried out to investigate effect of water resistance as an object moves through liquid.</p>	<p>We measure time in s/ms using a stopwatch.</p>  <p>1 minute = 60 seconds</p> <p>We measure mass in kg/g using electronic scales.</p> <p>1kg – 1000g</p>	<p>A bar chart is a chart that has rectangles of different sizes to represent values. This is a way to visually compare data.</p> <p>Know how to draw a bar chart to compare data.</p>	<p>A causal relationship is when one thing is responsible for causing the occurrence of another thing.</p> <p>Know that results from scientific enquires might have different degrees of trust as external factors may impact on results.</p>

				It is important to repeat measurements to make sure your results are reliable.		
4		<p>Air resistance is a type of friction between air and another material. E.g. when an aeroplane flies through the air, air particles hit the aeroplane making it more difficult for it to move through the air.</p> 	<p>Comparative testing A comparative test is when you test and compare different cases and situations.</p> <p>A variable is a factor that can change.</p> <p>A comparative test can be carried out to investigate the effect of air resistance on an object.</p>	<p>We measure time in s/ms using a stopwatch.</p> <p>1 minute = 60 seconds</p> <p>It is important to repeat finding to make sure your results are reliable.</p>	<p>Know that a scatter graph is a way to present two sets of data to look for connections.</p> <p>Know how to draw a scatter graph.</p> <p>A scientific diagram can be used to explain a scientific concept.</p> <p>A diagram is a picture that is usually labelled.</p>	<p>A causal relationship is when one thing is responsible for causing the occurrence of another thing.</p> <p>Know that results from scientific enquires might have different degrees of trust as external factors may impact on results.</p>
5		<p>Friction is the action of one surface rubbing against another which slows or speeds up movement. E.g. a smooth surface creates less friction than a rough surface.</p>	<p>Comparative testing A comparative test is when you test and compare different cases and situations.</p> <p>A variable is a factor that can change.</p> <p>A comparative test can be carried out to investigate the impact of friction on how a hovercraft moves over different surfaces.</p>	<p>We can measure distance using a metre stick to the nearest half cm.</p> <p>1m = 100cm</p> 	<p>Know that a table is a simple way to present data collected in an investigation.</p> <p>Know how to draw a table as a simple way to present data.</p> <p>A scientific diagram can be used to explain a scientific concept.</p> <p>A diagram is a picture that is usually labelled.</p>	<p>A causal relationship is when one thing is responsible for causing the occurrence of another thing.</p> <p>Know that results from scientific enquires might have different degrees of trust as external factors may impact on results.</p>
6						
7		<p>Levers are machines used to increase force. They allow a smaller force to have a greater effect.</p>	<p>Pattern seeking Pattern seeking is when you observe variables that cannot be controlled to notice patterns.</p>	<p>We can measure force in Newtons using force metres.</p>	<p>Know that a table is a simple way to present data collected in a pattern seeking investigation.</p>	<p>Know that results from a scientific enquiry can be used to answer a scientific question e.g. 'How does size</p>


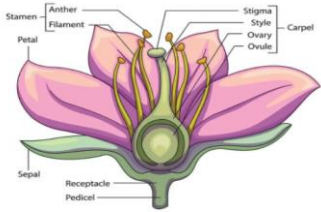


			<p>Variables are anything that can change or be changed.</p> <p>Pattern seeking enquiries can be carried out to find out the effects of different sized pulleys and leavers.</p>		<p>Know how to draw a table as a simple way to present data.</p> <p>A scientific diagram can be used to explain a scientific concept.</p> <p>A diagram is a picture that is usually labelled.</p>	<p>of the _____ effect the force needed to move the object.</p> <p>To answer a scientific question, you should include evidence from your scientific enquiry.</p>
8		<p>Gears can be used to allow a smaller force to have a greater effect.</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>Pattern seeking enquiries can be carried out to find out the effect different sized gears have on the movement of an object</p>	<p>We can measure force in Newtons using force metres.</p>	<p>Know that a table is a simple way to present data collected in a pattern seeking investigation.</p> <p>Know how to draw a table as a simple way to present data.</p>	<p>Know that results from a scientific enquiry can be used to answer a scientific question e.g. 'How does size of the _____ effect the force needed to move the object.</p> <p>To answer a scientific question, you should include evidence from your scientific enquiry.</p>

HT5 - Living things and their habitat

Lesson sequence

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
Revisit of prior learning	<p>Review what plants need to survive.</p> <p>Review the parts and functions of a flowering plant.</p>	<p>Review the characteristics of a living thing (MRS GREN)</p> <p>Review term reproduction linked to plants.</p> <p>Describe the life process</p>	<p>Review vertebrate and invertebrate.</p> <p>Review term reproduction linked to plants.</p>	<p>Review stages of the human life cycle.</p> <p>Review names of groups of common animals -mammal, amphibian, insect and bird.</p>	<p>Review stages of the human life cycle.</p> <p>Review names of groups of common animals -mammal, amphibian, insect and bird.</p>	<p>Review the similarities and differences of animal life cycles.</p>
Lesson sequence	<p>Identify the key parts and function of flowering plants.</p> <p>Plant dissection.</p>	<p>of reproduction in plants including sexual and asexual.</p> <p>Identify different types of reproduction in plants.</p>	<p>Describe the life process of reproduction in some animals.</p>	<p>Investigate the life cycles of common insects and amphibians.</p>	<p>Investigate the life cycles of common mammal and birds.</p>	<p>Children to look at the work of David Attenborough and Jane Goodall.</p>

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><u>Parts of a flowering plant</u> Anther – male part that makes pollen. Filament – male part of the flower that holds up the anther. Ovule – female gamete Stigma – female part. It is sticky and can catch grains easily. Style – female part. Pollen travels down the style to the ovary. Ovary – female part. Contains the ovules. Petal – brightly coloured and sweetly scented to attract insects. Pollen tube – transports male gametes from the pollen down the style to the ovary. Stem – transports water to the leaves.</p> 	<p><u>Identifying and 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.</p> <p><u>Research using secondary sources</u> Research is an investigation or study to find out facts in order to reach a conclusion.</p> <p>Secondary sources are works such as textbooks, encyclopaedia and scientific books. They describe, discuss and evaluate primary sources.</p> <p>Know that information texts use scientific language.</p> <p>Secondary sources can be used to identify the parts of a flowering plant.</p>	<p>You can use a magnifying glass to observe closely.</p>  <p>You can use scissors and tweezers to help you dissect something.</p> 	<p>A diagram is a picture that is usually labelled.</p> <p>A scientific diagram might not be to scale e.g. a diagram of a flower might be a different size to the real flowers.</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 scientific language should be used when explaining findings.</p>



Reproduction - when living things create other living things. Animals have babies and plants have seeds which turn into new plants.

Reproduction in plants

Sexual reproduction (2 parents) – when the pollen from one flower joins the egg of a new flower and a seed or seeds are formed.

E.g. apple tree

Asexual reproduction (1 parent) – when a small part of a plant breaks off and starts to grow until it is the same size as the plant it came from. Flowers are not needed.

E.g. spider plant

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

Research using secondary sources

Research is an investigation or study to find out facts in order to reach a conclusion.

Secondary sources are works such as textbooks, encyclopaedia and scientific books. They describe, discuss and evaluate primary sources.

Know that information texts use scientific language.

Secondary sources can be used to identify plant types.

Observation over time

Observing over time is when make systematic and careful observation to identify and measure changes in materials over a period of time.

Regular observations/ measurements need to be made at set intervals.

External factors may affect results.



You can use an iPad to take photographs to record changes.



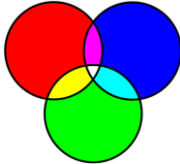




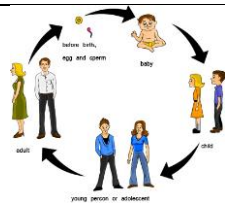
Know that findings from enquires can be reported in different ways e.g. orally, written, results presentation or as a conclusion.

Know that scientific language should be used when explaining findings.

Know that results from scientific enquires might have different degrees of trust as external factors may impact on results.

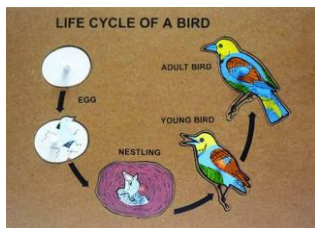
			<p>An observation over time can let you compare the differences in growing plants from seeds (sexual reproduction) and from cuttings and tubers etc. (asexual).</p>			
3	 	<p>Reproduction in animals For most animals that live on land, offspring are fertilised inside the mother's body. This happens in one of three ways.</p> <ol style="list-style-type: none"> 1. The young develop inside the female and are born alive (most mammals). 2. Fertilised eggs are laid outside the female's body and develop in the egg getting nourishment from the yolk. <p>In some animals the eggs are held within the female.</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 animals as viviparous and oviparous.</p> <p>Researching using secondary sources Research is an investigation or study to find out facts in order to reach a conclusion.</p> <p>Secondary sources are works such as textbooks, encyclopaedia and scientific books. They describe, discuss and evaluate primary sources.</p> <p>Know that information texts use scientific language.</p> <p>Secondary sources can be used to investigate gestation periods of different animals.</p>		<p>When you collect data it needs to be presented in a way that is clear and easy to understand.</p> <p>A data base is a collection of data that is stored in a logical and structured manner.</p>	

<p>4</p>	 	<p>A life cycle shows how things are born, how they grow and how they reproduce.</p> <p><u>Insect life cycle</u> Most insects, such as butterflies, emerge from the egg in one state and then go through metamorphosis to become an adult. Some insects hatch from the egg and grow into adults without much change.</p> <p><u>Amphibian life cycle</u> Amphibians, such as frogs, are laid in eggs in the water then, once hatched, they go through many changes until they become an adult. Parents do not look after their young once the eggs have been laid.</p>	<p><u>Pattern-seeking</u> 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>A pattern seeking investigation can be carried out to compare and contrast life cycles.</p> <p><u>Researching using secondary sources</u> Research is an investigation or study to find out facts in order to reach a conclusion.</p> <p>Secondary sources are works such as textbooks, encyclopaedia and scientific books. They describe, discuss and evaluate primary sources.</p> <p>Know that information texts use scientific language.</p> <p>Secondary sources of information can be used to research animal life cycles.</p>		<p>A Venn diagram uses circles to show the relationship between things.</p>  <p>Know how to draw a Venn diagram.</p> <p>A diagram is a picture that is usually labelled.</p>	
<p>5</p>	 	<p><u>Mammal life cycle</u> Mammals, including humans, develop inside their mothers and live young are born. Young are fed milk and are dependent on their parent for some time, until they are old enough to look after themselves.</p>	<p><u>Pattern-seeking</u> 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>A Venn diagram uses circles to show the relationship between things.</p> <p>Know how to draw a Venn diagram.</p> <p>A diagram is a picture that is usually labelled.</p>	



Bird life cycle

Birds are hatched from eggs and are looked after by their parents until they are able to live independently.



Compare and contrast life cycles.

Researching using secondary sources

Research is an investigation or study to find out facts in order to reach a conclusion.

Secondary sources are works such as textbooks, encyclopaedia and scientific books. They describe, discuss and evaluate primary sources.

Know that information texts use scientific language.

6



David Attenborough

Famous for his commitment to the natural environment. He has spent years studying animals and living things.

Jane Goodall

British scientist famous for work with chimpanzees. She showed that chimps have individual personalities and experience emotions.

Researching using secondary sources

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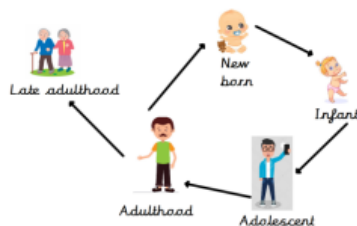
Research into the life of these biologists and the impact of their findings and teachings.

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
Revisit of prior learning	Review role of skeleton as support/protection for the body. Review major parts of the human skeleton. Review terms vertebrate and invertebrate. Review that animals, including humans, have offspring, which grow into adults.	Review names of the different types of teeth and their functions. Review gestation periods in humans and animals. Describe the changes as	Review the importance of eating the right amount of different types of food. Review stages of foetal development.	Review key milestones during baby and child development.	Review changes that happen to the boy during puberty.	Review physical and mental changes that happen from adulthood to old age. Review the stages of development from foetus to old age in humans. Review what a life cycle is - previously looked at lifecycle of a plant.
Lesson sequence	Describe the changes as humans develop to old age - find out and compare gestation periods of a range of animals including humans.	humans develop to old age - Investigate foetal development in humans.	Describe the changes as humans develop to old age - Recognise and explore key milestones in baby and child development.	Describe the changes as humans develop to old age - Identify and understand the key changes that happen in the human body during puberty. Recognise those changes that are gender specific.	Describe the changes as humans develop to old age - Identify physical and mental changes that happen from adulthood to old age.	Describe the changes as humans develop to old age - Identify, order and explain the 6 stages in a human life cycle.

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>Human life cycle Newborn > Childhood > Adolescence > Early adulthood > middle adulthood > Late adulthood.</p> <p>Gestation – the process in which babies grow inside their mother's body</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>		Know that a table is a simple way to present data collected in an investigation.	<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>

before they are born. This period of time differs between species.



A pattern seeking enquiry can be carried out to investigate the relationship between animals size/life-span and gestation period.

Research using secondary sources
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Know that information texts use scientific language.

Secondary sources of information can be used to research animal gestation periods.

Independent Variable (Unit)	Dependent Variable (Unit)			
	Test 1	Test 2	Test 3	Average
0.0	0.0	0.0	0.0	0.0
1.0	0.5	0.4	0.9	0.6
2.0	1.5	1.2	1.2	1.3
3.0	1.7	1.8	1.9	1.8
4.0	2.5	2.1	2.3	2.3
5.0	3.1	3.2	2.7	3.0

Know how to draw a table as a simple way to present data.

A causal relationship is when one thing is responsible for causing the occurrence of another thing.

2



Foetus - After eight weeks, the group of cells in the mother's womb develops more human-like features, becoming a foetus. The foetus grows inside its mother's womb for nine months. A foetus is completely reliant on its mother and cannot breathe, eat or drink for itself. It receives its nutrition through the umbilical cord.

Research using secondary sources
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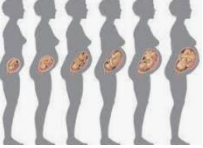
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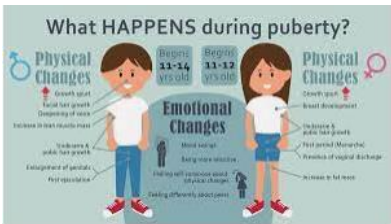
Know that information texts use scientific language.

A line graph is a graph that is used to display change over time. A series of data points are connected by a straight line.

Know how to draw a line graph to show foetal growth.

Understand that information about foetal development is taken from an average and that many babies may be above or below this.

			<p>Secondary sources of information can be used to investigate foetal development.</p> <p><u>Pattern-seeking</u> 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>A pattern seeking investigation can be carried out to make generalisations about the pattern of foetal growth.</p>			
3		<p>New-born – baby that has just been born Infancy – a period of rapid change. Toddlers learn to walk and talk. Childhood – children learn new things as they grow</p> 	<p><u>Pattern-seeking</u> 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>A pattern seeking investigation can be carried out to make generalisations about changes between birth, infancy and a toddler</p> <p><u>Identify/classify</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.</p>		<p>A Venn diagram uses circles to show the relationship between things.</p> <p>Know how to draw a Venn diagram to show the similarities and differences between babies, infants and toddlers.</p>	<p>To answer a scientific question, you should include evidence from your scientific enquiry.</p> <p>Conclude that a baby can move but can't walk or talk, in infancy they begin to crawl and say some words and a toddler learns to walk and talk.</p>

			<p>You can identify similarities and differences between the features of a baby, infant and a toddler.</p>			
<p>4</p>		<p>Adolescence – the body starts to change as it prepares for adulthood. Hormonal changes take place over a few years. This is called puberty.</p> <p>Puberty is when the body starts to change because of hormones. These changes include: growth in height, more sweat, and hair growth on arms, legs, under arms and on genitals. There is growth in parts of the body including male genitals and breasts.</p> 	<p>Research using secondary sources Research is an investigation or study to find out facts in order to reach a conclusion.</p> <p>Secondary sources are works such as textbooks, encyclopaedia and scientific books. They describe, discuss and evaluate primary sources.</p> <p>Know that information texts use scientific language.</p> <p>Secondary sources of information can be used to research what happens to the body during puberty.</p> <p>Identify/classify 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 identify the similarities and differences between males and females.</p>		<p>Know that a table is a simple way to present data collected in an investigation.</p> <p>Know how to draw a table as a simple way to present data.</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:</p> <ul style="list-style-type: none"> - Both males and females get pubic hair and spots. - Males develop testicles, Adams apple and a penis. - Females develop breasts.

5



Early adulthood – this is when humans are at their fittest and strongest. This is when reproduction usually happens.

Middle adulthood – changes such as hair loss happen. There are hormonal changes again and the ability to reproduce ceases. This is called the menopause.

Late adulthood – there is a decline in fitness and strength.

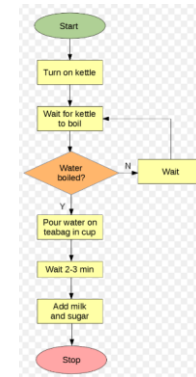
Research using secondary sources
 Research is an investigation or study to find out facts in order to reach a conclusion.

Secondary sources are works such as textbooks, encyclopaedia and scientific books. They describe, discuss and evaluate primary sources.

Know that information texts use scientific language.

Secondary sources of information can be used to research changes through adulthood.

A flow chart is a diagram that shows the sequence of movements or actions involved in a system.



6



Human life cycle
Newborn – baby that has just been born
 Infancy – a period of rapid change. Toddlers learn to walk and talk.
Childhood – children learn new things as they grow.
Adolescence – the body starts to change as it prepares for adulthood. Hormonal changes take place over a few years. This is called **puberty**.
Early adulthood – this is when humans are at their fittest and strongest. This is when reproduction usually happens.
Middle adulthood – changes such as hair loss happen. There are hormonal changes again and the ability to reproduce ceases. This is called the menopause.
Late adulthood – there is a decline in fitness and strength.