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	The national curriculum for science aims to ensure that all pupils: • 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	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. 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.

Personal Development Links						
	RESPECT	SMSC	Rights Respecting	British Values	Jigsaw	Trips and Visits

Topic Overview Year 1

	HT1	HT2	HT3	HT4	HT5	HT6
Year 1	Animals including humans		Materials		Plants	
	*Seasonal change (1 lesson each half term)					

All year - Seasonal Change

	HT1	HT2	HT3	HT4	HT5	HT6

Revisit of prior learning	Review names of seasons and whether the temperature is hot or cold.	Review names of the different seasons and whether the temperature is hot or cold.	Review weather associated with autumn and the length of an autumn day.	Review weather associated with winter and the length of a winter day.	Review weather associated with spring and the length of a spring day.	Review weather associated with the four seasons observed over the course of the school year.
Lesson sequence	Observe the oak tree (next to the benches in the KS1 playground) through photos and drawings, to watch closely over a period of time how it changes Through observation, photograph and draw the tree in Autumn, looking closely at the trunk, branch and leaves In Autumn, measure the temperature outside with a thermometer and compare this to how it feels when the weather is this temperature	To observe and describe weather associated with the seasons by observing the weather in autumn *Look at animals, trees, clothes we wear.* Observe how day length varies over the course of a year depending on the season	To observe and describe weather associated with the seasons by observing the weather in winter. *Look at animals, trees, clothes we wear.* Observe how day length varies over the course of a year depending on the season. In Winter, measure the temperature outside with a thermometer and compare this to how it feels when the weather is this temperature	To observe and describe weather associated with the seasons by observing the weather in spring. *Look at animals, trees, clothes we wear.* Observe how day length varies over the course of a year depending on the season.	To observe and describe weather associated with the seasons by observing the weather in summer. *Look at animals, trees, clothes we wear.* Observe how day length varies over the course of a year depending on the season. In Spring, measure the temperature outside with a thermometer and compare this to how it feels when the weather is this temperature	Describe the changes across the four seasons. Describe how the length of the day varies depending on the season. In Summer, measure the temperature outside with a thermometer and compare this to how it feels when the weather is this temperature

Knowledge – Year 1 (Seasonal change)

Substantive knowledge			Disciplinary Knowledge			
Personal Development			**Knowledge of methods that scientists use to answer questions** ***(Observation over time, pattern seeking, identify/classify, comparative/fair test, research using secondary sources)***	**Knowledge of apparatus and techniques, including measurement**	**Knowledge of data analysis**	**Knowledge of how science uses evidence to develop explanations.**
HT1		There are 4 seasons in the UK. **Autumn** – September, October, November **Winter** – December, January, February **Spring** – March, April, May **Summer** – June, July, August	<u>Observation over time</u> Observing over time is when you watch or measure something over a period of time to see how it changes. <u>Pattern Seeking</u> Pattern seeking is when you carry out simple tests or	A thermometer is an instrument that measures temperature. 		

				observe closely to look for patterns in results. You can ask questions to help you look for patterns.			
	HT2		**Autumn** • Harvest time is in this season. • Temperatures drop and it gets dark earlier because there is less sunlight. Skies can be overcast. Birds migrate to warmer climates. • Leaves change colour and start to fall from some trees. • Animals begin storing up food for the winter.	Observation over time Observing over time is when you watch or measure something over a period of time to see how it changes. Pattern Seeking Pattern seeking is when you carry out simple tests or observe closely to look for patterns in results. You can ask questions to help you look for patterns.	A thermometer is an instrument that measures temperature.	When you collect data it needs to be presented in a way that is clear and easy to understand.	Know that you can answer questions using knowledge from what you have observed. Know that you can use data you have collected to help answer questions. Know that a conclusion is when you answer a question using what you have found out in your scientific enquiry.
	HT3		**Winter** • The coldest time of the year. • There are less and less hours of daylight. • We sometimes see snow, frost in the morning, sleet blizzards and hail. Water freezes to ice. • Many plants stop growing. • Some trees lose all their leaves. • Some animals including hedgehogs and tortoises hibernate.	Observation over time Observing over time is when you watch or measure something over a period of time to see how it changes. Pattern Seeking Pattern seeking is when you carry out simple tests or observe closely to look for patterns in results. You can ask questions to help you look for patterns.	A thermometer is an instrument that measures temperature.	When you collect data it needs to be presented in a way that is clear and easy to understand.	Know that you can answer questions using knowledge from what you have observed. Know that you can use data you have collected to help answer questions. Know that a conclusion is when you answer a question using what you have found out in your scientific enquiry.
	HT4		**Spring**	Observation over time Observing over time is when you watch or measure something over a period of time to see how it changes. Pattern Seeking Pattern seeking is when you carry out simple tests or	A thermometer is an instrument that measures temperature.	When you collect data it needs to be presented in a way that is clear and easy to understand.	Know that you can answer questions using knowledge from what you have observed. Know that you can use data you have collected to help answer questions.

			• In this season temperatures rise and the ground starts to warm up. • Flowers begin to grow. • This season is associated with rebirth and growth. Some baby animals are born (e.g. lambs, chicks) 	observe closely to look for patterns in results. You can ask questions to help you look for patterns.			Know that a conclusion is when you answer a question using what you have found out in your scientific enquiry.
	HT5		**<u>Summer</u>** • The hottest time of the year. • There is usually sunshine, generally dry weather but there may be thunderstorms too. • Flowers and trees are in bloom. 	<u>Observation over time</u> Observing over time is when you watch or measure something over a period of time to see how it changes. <u>Pattern Seeking</u> Pattern seeking is when you carry out simple tests or observe closely to look for patterns in results. You can ask questions to help you look for patterns.	A thermometer is an instrument that measures temperature. 	When you collect data it needs to be presented in a way that is clear and easy to understand.	Know that you can answer questions using knowledge from what you have observed. Know that you can use data you have collected to help answer questions. Know that a conclusion is when you answer a question using what you have found out in your scientific enquiry.
	HT6		In the winter the sun rises later and sets earlier and our days are short. In the summer the sun rises earlier and sets later and our days are long.	<u>Observation over time</u> Observing over time is when you watch or measure something over a period of time to see how it changes. <u>Pattern Seeking</u> Pattern seeking is when you carry out simple tests or observe closely to look for patterns in results. You can ask questions to help you look for patterns.		When you collect data it needs to be presented in a way that is clear and easy to understand. A table is a simple way to present data. A tally chart is a simple way of recording data. Each item is represented by a line and the fifth line is drawn diagonally. Each gate represents five.	Know that you can answer questions using knowledge from what you have observed. Know that you can use data you have collected to help answer questions. Know that a conclusion is when you answer a question using what you have found out in your scientific enquiry.

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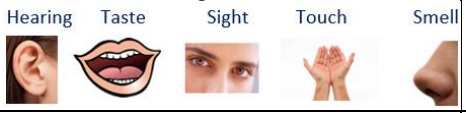
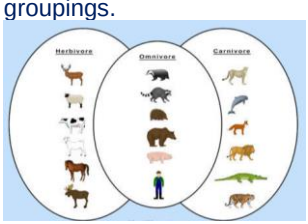
	Substantive knowledge			**Disciplinary Knowledge**				
	Personal Development			**Knowledge of methods that scientists use to answer questions** ***(Observation over time, pattern seeking, identify/classify, comparative/fair test, research using secondary sources)***	**Knowledge of apparatus and techniques, including measurement**	**Knowledge of data analysis**	**Knowledge of how science uses evidence to develop explanations.**	
	1							
	2	 	Children can identify name, draw and label these basic parts of a human body: **head, neck, arms, elbows, legs, knees, face, ears, eyes, hair, mouth, teeth.**	<u>Identify and Classify</u> Know that the name of the body part matches a part of the body. Identify which part of the body is associated with each sense. Senses experiment. Record results in a table.				
	3		Children know the five senses and the body parts associated with them: - We **smell** using our nose - We **taste** using our tongue - We **touch** using parts of our body e.g. hands - We **see** using our eyes - We **hear** using our ears. 	<u>Identify and Classify</u> Know that parts of the body have different senses				
	4					Know that when you collect results from an experiment, it can be recorded in a table that is clear and easy to understand. A table is a simple way to present data.		
	5		Children can identify the following animals: **Fish** – cod, trout, mackerel, bass 	<u>Identify and Classify</u> Classifying is when you sort items into groups based on similarities and differences. Know that animals can be sorted into different groups, based on their similarities and differences		A table is a simple way to present data		
	6		**Amphibians** – frog, toad, salamander, newt 					

			Reptiles – snake, crocodile, turtle, Komodo dragon.  **Mammals** – humans, monkeys, bears, dogs  **Birds** – sparrow, robin, seagull, crow 				
7 **8**			**The structure of common animals** **Fish** (live in the sea) – cold blooded, breathe through gills, scales on skin, fins to help them move through water. **Amphibian** (live on land or in water) – cold blooded, lay eggs, have gills and lungs so **Reptile –** cold blooded, scales on skin, breathe through lungs, have 4 legs, lay eggs. **Birds** – have wings, feathers, 2 legs, most can fly, and they have a beak instead of teeth. They hatch from eggs, live in a nest and have lungs to breathe. **Mammals (including humans) –** warm blooded, large brain, usually have 4 legs, have a coat of hair to trap warm air, they give birth to live babies who are fed milk produced by the mother.	<u>Identify and Classify</u> Classifying is when you sort items into groups based on similarities and differences. Know that animals can be sorted into different groups, based on their similarities and differences. Know the different classification of different animal groups.		A table is a simple way to present data	Know that you can use data collected to help answer questions Know that you can answer questions using knowledge from what you what animals you have observed, based on their features.
9			**What animals eat** **Carnivores** – eat meat e.g. lions, snakes, spiders, wolves **Herbivore** – eat plants e.g. rabbits, cows, sheep, pandas **Omnivore** – eat meat and plants e.g. pigs, chickens, rats, badgers	<u>Identify and Classify</u> Know that animals can be grouped based on their diet.		A Venn diagram is used to classify three different groupings. 	Know that you can answer questions using knowledge from what animals you have observed, based on their diet.

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
Revisit of prior learning		Review names of everyday materials.	Review names of common objects and the types of materials they are made from.	Review the physical properties of a variety of everyday materials.	Review the physical properties of a variety of everyday materials.	Review the physical properties of a variety of everyday materials.
Lesson sequence	Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock.	Distinguish between an object and the material from which it is made by naming objects and identifying the materials they are made from.	Describe the simple physical properties of a variety of everyday materials.	To describe the simple physical properties of a variety of everyday materials by testing different objects.	Investigate which material would be best to make different objects e.g. an umbrella.	Compare and group together a variety of everyday materials on the basis of their simple physical properties.

Knowledge – Everyday materials (STEM topic – Fairgrounds)

	Substantive knowledge			Disciplinary Knowledge			
	Personal Development			Knowledge of methods that scientists use to answer questions *(Observation over time, pattern seeking, identify/classify, comparative/fair test, research using secondary sources)*	Knowledge of apparatus and techniques, including measurement	Knowledge of data analysis	Knowledge of how science uses evidence to develop explanations.
1			Children know, name and recognise materials made from; wood, plastic, glass and metal.    	**Identifying, classifying and grouping.** Classifying is when you sort items into groups based on similarities and differences Know that we can sort objects into the different materials they are made from. E.g. wood, glass, metal and plastic. To help classify what materials objects are made from, know that it is good to observe them closely. To help classify what materials the objects are		Know that when you collect results from an experiment, it can be recorded in a table that is clear and easy to understand.	Know that you can answer questions about materials using knowledge from what they have observed Know that you can use data you have collected to help answer questions about some objects and the materials they are made from. Know that a conclusion is when you answer questions about some objects and what they are made from. Conclude that some objects are made of more than one material.

				made from, know that it is good to ask questions.			
	2		Children can explain what these everyday materials are used for and give examples: Wood – pencils, benches  Plastic – school trays, lunchbox  Glass – windows, drinking glasses  Metal – scissors, knife and fork 	**<u>Identifying, classifying and grouping.</u>** To observe by looking closely at the materials a car is made of. Classify what materials a car is made out of by identifying the different materials: wood, plastic, glass and metal **<u>Pattern Seeking</u>** Ask simple questions about the make-up of a car to help look for patterns		Know that you can answer questions about the materials a car is made from, using knowledge from what they have observed Know that a conclusion is when you can explain why different materials are used for certain parts (e.g. windows are made of glass because they need to be transparent), following what you have found out in your scientific enquiry
	3		Waterproof – something that repels liquid and does not absorb liquid Absorbent – something that soaks in a liquid Transparent – something that you can see through Opaque – something that you cannot see through Hard – something that is solid and does not easily break Soft – something that can bend and move without breaking Shiny – something that reflects light Dull – something that does not reflect light	**<u>Pattern seeking</u>** Know that pattern seeking is when observe the features of the different materials and their uses. Carry out simple tests on materials to look for patterns in properties e.g. if they are waterproof, absorbent, transparent, opaque, hard, soft, shiny or dull.			Know that you can answer questions using knowledge from what they have observed about materials. Explain they materials can come in different forms, which therefore means they have different features. E.g. some plastic is transparent and some is opaque.
	4			**<u>Pattern seeking</u>** Know that pattern seeking is when observe the features of the different materials and their uses. Carry out simple tests on materials to look for patterns in properties e.g. if they are waterproof, absorbent, transparent,			Know that a conclusion is when you answer a question using what you have found out in your scientific enquiry. To conclude, explain they can come in different forms, which therefore means they have different features. E.g. some plastic is transparent and some is opaque.

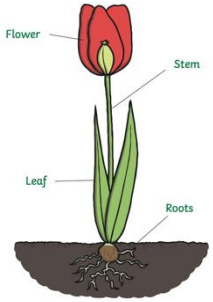
				opaque, hard, soft, shiny or dull.		
	5		Wood is a natural material that comes from trees, it absorbs water, and it is opaque, hard and dull. Plastic is human made, waterproof, transparent, opaque, hard, and dull. Glass is human made, waterproof, transparent, hard, and shiny.	**Pattern seeking** Know that pattern seeking is when you carry out simple tests or observe closely when checking the suitability of materials to make a fairground ride model (playdough, LEGO, wooden blocks).		Know that results from a scientific enquiry can be used to answer which materials are most suitable to make a fairground ride with
	6		Metal is human made, waterproof, opaque, shiny	**Pattern seeking** Know that pattern seeking is when you carry out simple tests or observe closely. Test fairground rides to look for patterns in properties of materials to check and evaluate the suitability of their chosen materials		Know that a conclusion is when you answer a question about what you have found out in your scientific enquiry, which is the suitability of the materials chosen for their fairground rides.

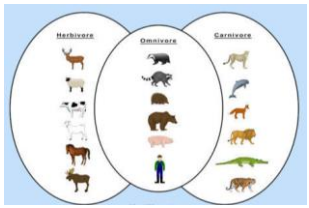
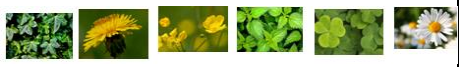
HT5 and HT6 - Plants

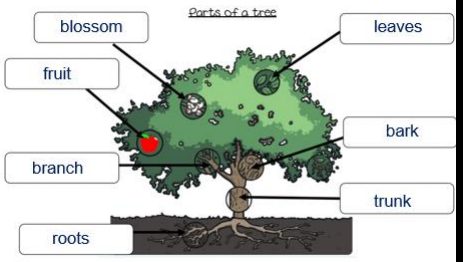
	Week 1	Week 2	Week 3	Week 4	Week 5 & 6	Week 7 & 8	Week 9	Week 10
Revisit of prior	Review basic parts of a plant (flower, petal, leaf, stem, roots	Review basic parts of a plant (flower, petal, leaf, stem, roots	Review names of common garden plants.	Review weather associated with spring and the length of a spring day.	Review names of common wild plants.	Review names of common plant and trees including deciduous and evergreen	Review names of common plant and trees including deciduous and evergreen.	Review the basic structure of common flowering plants.
Lesson sequence	Identify and describe the basic structure of a variety of common flowering plants - *children to plant sunflowers to observe growth throughout topic.* Give children an incorrect example of	Identify and name a variety of common garden plants.	Identify and name a variety of common wild plants.	To observe and describe weather associated with the seasons by observing the weather in spring. *Look at animals, trees, clothes we wear.* Observe how day length varies over the course of a year	Identify and name common trees including deciduous and evergreen.	Identify and describe the basic structure of a variety of common flowering plants.	Observe changes that have happened to seeds/beans planted in week 1.	Children are to describe the changes as a plant grows from a seed.

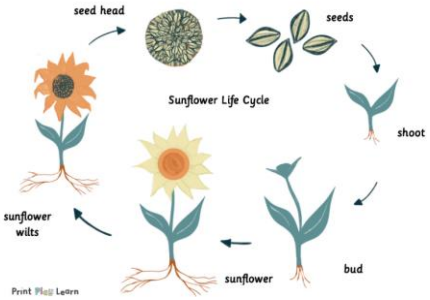
	the structure of a plant.			depending on the season.				

Knowledge – Plants

Substantive knowledge			Disciplinary Knowledge			
Personal Development			Knowledge of methods that scientists use to answer questions *(Observation over time, pattern seeking, identify/classify, comparative/fair test, research using secondary sources)*	Knowledge of apparatus and techniques, including measurement	Knowledge of data analysis	Knowledge of how science uses evidence to develop explanations.
1		The main parts of a plant are: **Flowers** – look pretty and come in different colours. They help attract animals and insects that help the plant to make seeds for new plants. **Stem** – helps support the plant and keeps it upright. Water and food are taken up from the roots and transported through the stem. **Leaves** – they absorb sunlight which is used to make food for the plant. **Roots** – anchor the plants in the ground. Without roots a plant would fall over. Roots also take water and nutrients from the soil.  	**Observation over time (every week)** Observing over time is when you watch or measure something over a period of time to see how it changes. A sunflower seed can be planted and observed closely to see how it grows/changes every week. **Identifying and classifying** You can identify the different parts of a plant (sunflower, tulip) by observing closely (flower, stem, leaves and roots). **Pattern seeking** Know that pattern seeking is when you carry out simple tests or observe closely. You can test what a plant needs to grow through pattern seeking.		Know that the data and results presented will help answer questions using the knowledge from what has been observed. A sunflower diary is a way to collect data each week and present results clearly.	

	2		**Common garden plants** People grow plants in their garden. They may grow flowering plants which are beautiful to look at or grow beans/seeds for food. Rose Poppy Heather Lavender Sunflower Pansy 	**Identifying and classifying** You can classify garden plants as ones that are for looking beautiful and ones that are for food. Know that when you classify plants, you look for similarities and differences. Parts may look different but have the same function. **Research using secondary sources** Know that you can use the internet to research the names of common garden plants, Know that Kiddle is a child friendly search engine.		Know that a VENN diagram can be used to present the classification of garden plants as ones that are beautiful and ones that are for food. 	Conclude that garden plants may look different but have the same parts and functions.
	3 4		**Common wild plants** A wild plant is one that grows by itself. A wild plant grows where a seed falls – it doesn't need to be planted. A wild plant doesn't need to be cared for. Daisy Nettle Buttercup Dandelion Clover Ivy 	**Identifying and classifying** Know that to identify and classify wild plants you need to observe them closely. These can be found on the school field. Using a tally chart, children will sort flowers found in the field into a tally chary. **Research using secondary sources** Know that Kiddle is a child friendly search engine that you can use to research the names of garden plants. **Pattern seeking** Know that pattern seeking can be used to spot patterns in where certain wild flowers grow.	A ruler is used to measure the height and length of something. It measures in cm. You can measure the height of a sunflower using a ruler.  To measure correctly 0 needs to be at the start of the item you are measuring.	A sunflower diary is a clear way of recording the observation of changes of a sunflower over time. A table is a clear way to record the sorting of wild flowers. . A tally chart is a simple way of recording data. Each item is represented by a line and the fifth line is drawn diagonally. Each gate represents five. A tally chart can be used to record the number of wild flowers observed on the school field. 1 I 6 𝍸 I 2 II 7 𝍸 II 3 III 8 𝍸 III 4 IIII 9 𝍸 IIII 5 𝍸 10 𝍸 𝍸	Know that from observing in the field, you can answer questions about where wild flowers grow, using what you have found out in scientific enquiry. Know that nettles and ivy can be found at the edge of a green space and daises, buttercups, dandelions and clovers are scattered around, with no particular pattern.

	5		**Common trees** Beech Oak Sycamore Chestnut Apple Holly Cedar Spruce Parts of a tree: Leaves Fruit Blossom Branches Trunk Roots	**Identifying and classifying** You can identify the different parts of a tree: roots, a trunk, branches, leaves. Observation can be used to compare parts of a tree to parts of a plant. **Pattern seeking** Know that you can ask questions to identify what is the same and what is different about the parts of a tree. This will help look for patterns.	A ruler is used to measure the height and length of something. It measures in cm. You can measure the height of a sunflower using a ruler.  To measure correctly 0 needs to be at the start of the item you are measuring.	Know that you can record the changes in a sunflower overtime in a sunflower diary. A labeled diagram can be used to show the different parts of a tree.	Conclude that trees can look different but have the same features.
	6				A ruler is used to measure the height and length of something. It measures in cm. You can measure the height of a sunflower using a ruler.  To measure correctly 0 needs to be at the start of the item you are measuring.	Know that you can record the changes in a sunflower overtime in a sunflower diary.	
	7		**Trees** **Deciduous** – a tree that sheds its leaves during autumn. During autumn they change colour before falling off. **Evergreen** – A tree that keeps its leaves all year round even in winter. 	**Identifying and classifying** Sorting trees into groups- those that are deciduous and those that are evergreen.	A ruler is used to measure the height and length of something. It measures in cm. You can measure the height of a sunflower using a ruler.  To measure correctly 0 needs to be at the start of the item you are measuring.	Know that you can record the changes in a sunflower overtime in a sunflower diary. When you collect data it needs to be presented in a way that is clear and easy to understand. A table is a simple way to present data.	
	8				A ruler is used to measure the height and length of	Know that you can record the changes in a sunflower	

					something. It measures in cm. You can measure the height of a sunflower using a ruler.  To measure correctly 0 needs to be at the start of the item you are measuring.	overtime in a sunflower diary.	
	9		Plants change as they grow. 		A ruler is used to measure the height and length of something. It measures in cm. You can measure the height of a sunflower using a ruler.  To measure correctly 0 needs to be at the start of the item you are measuring.	Know that you can record the changes in a sunflower overtime in a sunflower diary.	
	10		Know how a sunflower seed grows into a sunflower plant. A seed is planted in soil. It is watered and left in a light and warm place. It takes 1-2 weeks to germinate. A shoot starts to grow. A few leaves appear. The plant grows and a bud forms. The head of the flower opens. The seeds will fall from the flower head to the ground and grow into new flowers.		A ruler is used to measure the height and length of something. It measures in cm. You can measure the height of a sunflower using a ruler.  To measure correctly 0 needs to be at the start of the item you are measuring.	Know that you can record the changes in a sunflower overtime in a sunflower diary.	Know that you can use the observations collected over time to conclude that a sunflower seed changes when it is given water, light and space.