



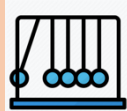
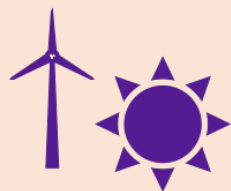
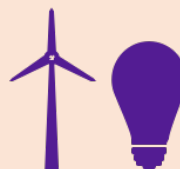
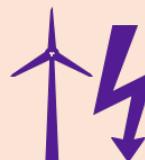
*At St Peter's we believe that all children should be enthused
by the ever-changing world and be equipped with skills
that allow them to flourish.*



Science curriculum progression

		Autumn	Spring		Summer	
Early	Year 1	Properties of materials Identify materials and their properties	Alive (Structure and Function) Identify common deciduous trees/ plants and plants their basic parts. Energy - Sun Notice the impact of energy from the sun in Autumn	Alive (Structure and Function) Identify common evergreen trees / plants and their basic parts. Energy - Sun Notice the impact of energy from the sun in Winter	Alive (Structure and Function) Identify common animals and body parts. Energy - Sun Notice the impact of energy from the sun in Spring	Alive (Structure and Function) Identify common wild and garden plants and their basic parts. Energy - Sun Notice the impact of energy from the sun in Summer
	Year 2	Properties/changing materials Compare suitability of materials to their uses and the impact of changing their shape	Thrive & Survive Identify what animals need to thrive and survive	Reproduction Notice that animals reproduce	Alive (Structure and Function) Observe how plants grow Thrive & Survive Identify what plants need to thrive and survive Alive (Structure and Function) Identify the 7 live processes	Thrive & Survive Identify how plants and animals thrive and survive together in habitats
Novice	Year 3	Energy - Light Notice light and dark including shadows	Forces: contact & non-contact Notice and compare simple contact and non-contact forces through friction and magnets	Alive (Structure and Function) Identify the structure and function of human skeleton and muscles and parts of a flowering plant.	Alive (Structure and Function) Use knowledge of structure and function of plants and animals to classify them in broad groups Reproduction Explore the function of the flower in pollination and seed dispersal	Properties/changing materials Compare rocks and soils and describe fossil formation
Growing Expertise	Year 4	Properties/changing materials Observe and measure changes of state	Energy – Sound Explore how sound energy travels in vibration waves	Alive (Structure and Function) Identify the structure and function of different parts of the digestive system (including teeth)	Diversity Use knowledge of structure of plants and animals to group them Thrive and Survive Construct food chains and reason about the impact of environmental change on thrive and survive	Energy - Electricity Explore the impact of an open and closed circuit on electrical energy?
	Year 5	Properties/changing materials Explain the processes and outcomes of some reversible and irreversible changes which include changes of state.	Forces: contact & non-contact Identify and explain the effects of unbalanced forces	Forces: contact & non-contact Describe the orbits of the earth and moon	Alive (Structure and Function) Describe how human structure and function changes as they age. Reproduction Describe and compare the process of sexual reproduction in some animals	Reproduction Describe and compare the process of sexual and asexual reproduction in some plants.
	Year 6	Alive (Structure and Function) Identify the structure and function of main different parts of the human circulatory system	Alive (Structure and Function) Use knowledge of structure and function of plants and animals to classify them in broad groups	Thrive and Survive Recognise ways in which humans can support or hinder their ability to thrive.	Diversity Identify adaptations and its role in evolution Energy - Light Explore how light energy travels in straight lines.	Energy – Electricity Explore the impact of varying voltage in a circuit

Big ideas

Biology	Alive (structure and function)	Thrive and survive	Reproduction	Diversity	
					
Chemistry	Materials				
					
Physics	Forces: contact and non-contact	Energy – sun	Energy – light	Energy – sound	Energy – electricity
					

EYFS

Working Scientifically concepts

Asking and exploring questions 	Making predictions 	Scientific enquiry 	Observing and measuring 	Recording data 	Concluding and evaluating 	Applying scientific knowledge 
Ask questions to clarify understanding and aspects of their familiar world e.g. place they live or the natural world. Question why things happen.	Show curiosity about objects, events and people.	Find ways to solve problems/find new ways to do things. Take risks through trial and error. Choose the resources they need for a chosen activity from their environment.	Explore the natural world making observations (e.g seasons) including similarities and differences Observe and describe what they see using everyday language. Take measurements initially by comparisons then begin to use non-standard units. Make links and notice patterns in their experiences. Explore different equipment and find out what its uses are.	Draw pictures of objects in their own environment. Take photos of things of interest to them. Start to mark-make to record results. Sort in more than 2 groups using familiar categories. Create a class chart using pictures and objects.	Talk about what they have found and say what worked well. Describe how things work in simple terms and make basic alterations and suggest things that did not work Come up with alternative ways of doing things through exploration. Say or indicate by smiley faces/scale if they have achieved the learning objective.	Offer explanations for why things happen-making use of recently introduced scientific vocabulary. Develop vocabulary which meets the breadth of their experiences Develop own narrative and explanations by connecting ideas or events.

	Term 1	Term 2	Term 3
Unit	 Animals including humans – What should I eat and where does it come from? (food)	 Forces and magnets – How does that work? (forces and machines)	 Animals including humans – How can I explore my world? (senses)
Story link	Oliver's Fruit Salad	Rosie Revere, Engineer	Chocolate – Micheal Rosen
EYFS Framework	- Children in reception PD : Know and talk about different factors that support their overall health and wellbeing: - Regular physical activity - Healthy eating - Toothbrushing - Sensible amounts of 'screen time' - Having a good sleep routine - Being a safe pedestrian	ELG UtW: Explore the natural world around them, making observations and drawing pictures of animals and plants.	- ELG UtW: : Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter. - ELG UtW: Explore the natural world around them, making observations and drawing pictures of animals and plants.
	Term 4	Term 5	Term 6
Unit	 Seasonal changes, living things and their habitats – What will I see outside? (seasons and weather, plants and insects)	 Materials– What is that made of?	 Animals Including Humans – Are all animals the same?
Story link	The Oak Tree, Julia Donaldson	The Three Little Pigs	The Zoo is Not For You
EYFS Framework	- ELG UtW: Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter. - ELG UtW: Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class. - ELG UtW: Explore the natural world around them, making observations and drawing pictures of animals and plants.	- ELG UtW:: Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class. - ELG UtW:: Explore the natural world around them, making observations and drawing pictures of animals and plants. - ELG UtW: : Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.	ELG UtW: Explore the natural world around them, making observations and drawing pictures of animals and plants.

Year 1

Working Scientifically concepts

Asking and exploring questions 	Making predictions 	Scientific enquiry 	Observing and measuring 	Recording data 	Concluding and evaluating 	Applying scientific knowledge 
"what" questions - Explore the world around them and raise own questions. - Begin to ask simple questions and use simple secondary sources to find answers. - Ask yes and no questions to sort and classify using given criteria - Know that groups and sorting helps us observe similarities and differences. - Know that variables change over time. - Know that scientific questions should be based on something I can observe or measure.	- Make basic predictions over things they can see or their own ideas. - Use scientific vocabulary.	- Follow a modelled investigation in small parts. - Experience different types of enquiry including practical activities. - Use practical resources provided and suggest some of their own.	- Know that to observe means to look closely and notice similarities and differences related to the enquiry question - Know observation can be instant or take place over time. - Know that measuring tells the size of something. - Know how to use a hand lens - Know how to use same sized objects to make measure comparison - Use senses with the aid of simple equipment to make observations and take measurements. - With help and prompting, observe changes over time and describe the changes. - Identify, group, and compare using observations, video and photographs.	- Add labels to pictures to highlight features - Know where to place data on a given simple table - Know where to place data on a given bar chart / pictogram/ Venn diagram - Group things based on given criteria	- Know that my observations and recordings enable me to answer my question - Use observations and recordings to suggest an answer to a question. - Begin to notice patterns and relationships.	

Year 1	Term 1	Term 2	Term 3
Big Idea	Alive (structure and function) – Identify common animals and body parts  How are animals the same and different?	Alive (structure and function) – Identify common deciduous trees and their basic parts  Energy (sun) – Notice the impact of energy from the sun in Autumn.  What do you notice in our school environment in Autumn?	Alive (structure and function) – Identify common evergreen trees and their basic parts  Energy (sun) – Notice the impact of energy from the sun in Winter.  What do you notice in our school environment in Winter?
Science objectives	- identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. - identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals - identify and name a variety of common animals that are carnivores, herbivores and omnivores - describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)	- Observe changes across the four seasons. - Observe and describe weather associated with the seasons and how day length varies. - Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees	- Observe changes across the four seasons. - Observe and describe weather associated with the seasons and how day length varies. - Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees
Substantive knowledge	- Know that humans have eyes so they can see - Know that humans have ears to hear - Know that humans have a tongue to taste - Know that humans have skin to feel - Know that humans have a nose to smell - Know that humans use their sense to learn about the world - Know that a fish lives in the water, has scaly skin and fins and name some examples e.g.: - Know that a bird has feathers and lays eggs and name some examples e.g.: - Know that a reptile has scaly skin, lays eggs and name some examples - Know that amphibians can live in water and on land and name some examples e.g.: - Know that mammals give birth to live young that look like them and name some examples e.g.: - Know that carnivores eat only meat and name some examples. - Know that omnivore eat meat and vegetations and name. some examples e.g.:	- Know difference between a plant and a tree. - Know and identify leaf, stem, root, branch, trunk, blossom - To know that the sun is the main source of heat energy on earth. - Know that we need the sun to help things grow and to keep us warm. - To notice that in the autumn the temperature cools, the number of rainy days increases and daylight hours get shorter. - Know the difference between evergreen and deciduous trees. - Know that leaves fall from deciduous trees in Autumn. - Know the names of deciduous trees specifically: ...	- Know difference between a plant and a tree. - Know and identify leaf, stem, root,branch, trunk, blossom - To know that the sun is the main source of heat energy on earth. - To notice that in Winter, the temperature cools, the number of rainy days increases and daylight hours get shorter. - Know the difference between evergreen and deciduous. - Know the names of evergreen trees specifically: ...

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|--|---|--|--|
| | <ul style="list-style-type: none">• Know that herbivores only eat vegetation and name some examples e.g.: | | |
|--|---|--|--|

	Term 4	Term 5	Term 6
Big Idea	Alive (structure and function) – Identify wild flowering and non-flowering plants and their basic parts Energy (sun) – Notice the impact of energy from the sun in Spring.  What do you notice in our school environment in Spring?	Properties of materials – Identify materials and their properties  How do we identify different materials?	Alive (structure and function) – Identify common garden plants and their basic parts Energy (sun) – Notice the impact of energy from the sun in Summer.  What changes do you notice in the garden in the summer?
Science objectives	- Observe changes across the four seasons. - Observe and describe weather associated with the seasons and how day length varies. - Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees - Identify and describe the basic structure of a variety of common flowering plants, including trees	- distinguish between an object and the material from which it is made - identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock - describe the simple physical properties of a variety of everyday materials - compare and group together a variety of everyday materials on the basis of their simple physical properties.	- Observe changes across the four seasons. - Observe and describe weather associated with the seasons and how day length varies. - Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees - Identify and describe the basic structure of a variety of common flowering plants, including trees
Substantive knowledge	- Know difference between a plant and a tree - Know the difference between common and wild plants - Know and identify leaf, stem, root, flower, petal, branch, trunk, blossom - Know the names of wild plants, specifically, daisies, daffodils, nettles, buttercups, thistles, moss, brambles, - To know that the sun is the main source of heat energy on earth. - To notice that in Spring, the temperature warms, the number of rainy days decreases, and daylight hours get longer. - To notice that plants and flowers start to grow again in the spring.	- Know that there are different materials which can be identified using observations (including fabric, wood, plastic, glass). - Know that an object is made from / of a material. - Know that properties are the words used to describe what a material is like and what it can do. - Know that different materials have different properties. - Know that a soft material can be twisted and squashed and a hard material cannot. - Know that a stretchy material can be pulled - Know that stiff materials are not easy to bend and flexible materials are. - Know that a rough material has an uneven surface and a smooth material has an even surface. - Know waterproof materials do not let water through and absorbent materials do. - Know that opaque objects cannot be seen through but transparent objects can.	- Know the difference between garden and wild plants - Know and identify leaf, stem, root, flower, petal, branch, trunk, blossom - To know the names of garden plants, specifically Ox Eye Daisy, Verbena, Canna Lily, Allium, Tulips, Shasta Daisy to know that the sun is the main source of heat energy on earth. - To notice that in Summer, the temperature warms and days can be hot the number of rainy days decreases and daylight hours get longer.

Year 2

Working Scientifically concepts

Asking and exploring questions 	Making predictions 	Scientific enquiry 	Observing and measuring 	Recording data 	Concluding and evaluating 	Applying scientific knowledge 
"what" questions - Explore the world around them and raise own questions. - Begin to ask simple questions and use simple secondary sources to find answers. - Ask yes and no questions to sort and classify using given criteria - Know that groups and sorting helps us observe similarities and differences. - Know that variables change over time. - Know that scientific questions should be based on something I can observe or measure.	- Draw on knowledge from observations to make a prediction. - Begin to test predictions and later answer questions.	- Follow a modelled investigation in small parts. - Within a planning frame, can suggest resources they may need for the test. - Carry out simple tests linked to all types of enquiry.	- Know that to observe means to look closely and notice similarities and differences related to the enquiry question - Know observation can be instant or take place over time. - Know that measuring tells the size of something. - Know how to use a hand lens - Know how to use same sized objects to make measure comparison - Observe closely, using simple equipment. - Identify a variety of plants and animals using observations. - Observe similarities and differences between the growth stages of different plants. - Compare objects based on observable features. - Observe through video, first-hand observations and measurement how different animals including humans grow.	-Add labels to pictures to highlight features - Know where to place data on a given simple table - Know where to place data on a given bar chart / pictogram/ Venn diagram/ tally chart - Group things based on given criteria - Gather and record data to help in answering questions. - Record observations e.g. using photographs, videos, drawings, labelled diagrams or in writing. - Identify and classify based on observed characteristics -Explain reasoning clearly when sorting into groups.	- Know that my observations and recordings enable me to answer my question - Use observations and recordings to suggest an answer to a question. - Suggest some things that could be changed and evaluate why things went wrong. - Use success ladders with multiple criteria to evaluate the test or their understanding against the learning objective.	

Year 2	Term 1	Term 2	Term 3
Big Idea	Properties of materials – Compare suitability of materials to their uses and the impact of changing their shape  What can you use different materials for?	Thrive and survive – Identify what animals need to thrive and survive  What do animals need to survive and thrive?	Reproduction – Notice that animals reproduce  What do you notice about animal adults and their offspring?
Science objectives	- identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses - find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching	- find out about and describe the basic needs of animals, including humans, for survival (water, food and air) - describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene	notice that animals, including humans, have offspring which grow into adults
Substantive knowledge	- Know that a material's properties make it suitable for different uses. - Know and apply the properties of plastic to identify objects it is suited and not suited to. - Know and apply the properties of wood to identify objects it is suited and not suited to. - Know and apply the properties of metal to identify objects it is suited and not suited to. - Know and apply the properties of glass to identify objects it is suited and not suited to. - Know and apply the properties of rock to identify objects it is suited and not suited to. - Know and apply the properties of paper to identify objects it is suited and not suited to. - Know and apply the properties of cardboard to identify objects it is suited and not suited to.	- Know that animals need water, food and air to survive. - Know that humans need exercise to maintain their structure and movement. - Know that humans need a balanced diet of carbohydrate, vegetable and protein - Know the importance of hygiene for good health.	- Know that animals have offspring - Know offspring grow into adults - Know the names of common animals and their offspring e.g. egg, chick, chicken, spawn, tadpole, froglet, frog, baby, toddler, teenager, adult.

	Term 4	Term 5	Term 6
Big Idea	Alive (structure and function) – Observe how plants grow How do plants grow? 	Thrive and survive – Observe what plants need to thrive and survive  Alive (Structure and function) – Identify the 7 life processes What do plants need to thrive and survive?	Thrive and survive – Identify how plants and animals thrive and survive together in habitats  How do different habitats help animals to thrive and survive?
Science objectives	observe and describe how seeds and bulbs grow into mature plants	- find out and describe how plants need water, light and a suitable temperature to grow and stay healthy - explore and compare the differences between things that are living, dead, and things that have never been alive	- identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other - identify and name a variety of plants and animals in their habitats, including microhabitats - describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food
Substantive knowledge	- Know the difference between a seed and a bulb - To observe that stages of a plant's life cycle, including germination, seedling, young plant and mature plant - Observe that different plants grow at different speeds (i.e. cress is very quick whereas tulips from bulbs are slower)	- Know that plants need water and light and the correct temperature to grow and stay healthy. - Know that the absence of one or more of these will affect the health and growth of the plant. - Know that something that is living has to have 7 life processes (MRS NERG) – do not focus on respiration or excretion - Know that a living thing is dead if it no longer has all 7. - Know that it has never been alive If it has never had all 7.	- Know that a habitat is the environment in which an animal or plant usually lives. - Explain why previously studied plants and animals live in their habitats. - Know that a simple food chain starts with a plant and contains one or more animals - Construct a food chain using previously taught animals and plants. - Explain how plants and animals depend on each other to survive and thrive.

Year 3

Working Scientifically concepts

Asking and exploring questions 	Making predictions 	Scientific enquiry 	Observing and measuring 	Recording data 	Concluding and evaluating 	Applying scientific knowledge 
"how" questions -Ask relevant questions and using different types of scientific enquiries to answer them - I know that researching involves using secondary sources to find answers to questions - I know that my question is based on my variables - Gather, record, classify and present data in a variety of ways to help in answering questions - Use straightforward scientific evidence to answer questions. - Investigate and answer own questions linked to a shared planning frame.	- Make predictions from questions posed. - Make further predictions from what is observed or tested.	- Carry out a range of scientific investigations linked to all types of enquiry. - Know and give reasons for my choice of enquiry - Identify the control and dependent variables - Recognise a fair test - Know that comparative and fair testing involves exploring cause and effect. - Set up practical enquiries: comparative, and fair tests using planning frame. - Use a range of equipment with support.	- Know that I observe / measure the dependent variable. - Know that the control variable is the variable that is changing - Make systematic and careful observations and decide how to record them to answer a question. - Collect data from own observations and measurements. - Know that temperature is measured in °C using alcohol and digital thermometers. - Know that force is measured in N using a Newton meter - Know that sound is measured in decibels using dataloggers. <i>(KSI Maths Curriculum)</i> -I know that length is measured in m and cm using a ruler, tape measure -I know that capacity is measured in ml and L using measuring cylinders -I know that time is measured in mins and sec using a stopwatch	- Complete a prepared table where they add headings and results. - Know that the dependent variable data is organised in a table. - Produce vertical and horizontal bar charts adding own labels and bars. - Know that the control variable builds the x axis - Know that the dependent variable data is organised on the y axis - Record findings using scientific language, drawings and labelled diagrams. - Use simple classification keys and Venn diagram with 2 sorting criteria and 1 intersecting and give reasons for their sorting criteria. - Begin to use Carroll diagrams.	- Know how to use tables and bar charts to look for patterns and relationships (cause and effect) and describe these in words. - Know how to use the relationship (cause and effect) or pattern to predict a future change - Use scientific knowledge to explain findings. - Suggest improvements and raise further questions - Use evidence and subject knowledge to refute statements. - Make basic statements about what worked well and what they would change. - Use success ladders confidently to evaluate tests against multiple criteria and suggest simple next steps.	

			<i>-I know that mass is measured in g and Kg using balanced and digital scales</i> <i>-I can read scales in divisions of 1,2,5 and 10.</i>			
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Year 3	Term 1	Term 2	Term 3
Big Idea	Energy – Light – Notice light and dark including shadows How can we control light? 	Forces: contact & non-contact – Notice and compare simple contact and non-contact forces through friction and magnets. How do forces affect objects? 	Alive (structure and function) – Identify the structure and function of the human skeleton and muscles and parts of a flowering plant. How do some plants and animals stand up? 
Science objectives	- recognise that they need light in order to see things and that dark is the absence of light - notice that light is reflected from surfaces - recognise that light from the sun can be dangerous and that there are ways to protect their eyes - recognise that shadows are formed when the light from a light source is blocked by an opaque object - find patterns in the way that the size of shadows change	- notice that some forces need contact between 2 objects, but magnetic forces can act at a distance - observe how magnets attract or repel each other and attract some materials and not others - compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials - describe magnets as having 2 poles - predict whether 2 magnets will attract or repel each other, depending on which poles are facing - notice that some forces need contact between 2 objects - compare how things move on different surfaces	<u>Animals</u> - identify that humans and some other animals have skeletons and muscles for support, protection and movement <u>Plants</u> - identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers
Substantive knowledge	- Know that energy is the ability to do work. This can be in the form of light, heat, sound or movement. - Know that light is needed to see things - Know that dark is the absence of light. - Know that light reflected from surfaces. - Know that looking directly at the sun is dangerous. - Know that an opaque object blocks light. - Know that shadows are forms when light is blocked. - Know that transparent materials allow light through. - Notice that the closer an object to the light source the larger the shadow.	- Know that forces describe how objects affect each other. - A force is an active power (push or a pull) that makes something move, stop, speed up, slow down, or change direction. - Know that magnetic forces can act at a distance - Know that magnets can attract and repel each other and that this is an example of force - Know that some materials are attracted to magnets - Know that some metals are magnetic and this means they are attracted to magnets. - Know that magnets have a north and south pole. - Know that like poles repel and opposite poles attract. - Identify that objects move further on smoother surfaces. - Identify that objects move slower on rough surfaces and this is because of force acting upon the object to slow it down.	- Know that humans and animals have skeletons to protect their vital organs, provide support and to allow movement. - Know that humans and animals have muscles which work in pairs to allow movement. - Know that a stem/trunk provides support. - Know that the spine holds the upper part of the human body up - Know that the skull protects the brain - Know that the rib cage protects the heart and lungs - Know that bones are able to move because of joints - Know that different animals' skeletons have different structures and functions. - Know that the roots and stem/ trunk of a plant provide support and keep it upright.

	Term 4	Terms 5	Term 6
Big Idea	Thrive and survive – Explore and investigate nutrition in plants and animals  What do plants and animals need to survive and thrive?	Reproduction – Explore the function of the flower in pollination and seed dispersal  How do flowering plants reproduce?	Properties of materials – Compare rocks and soils and describe fossil formation.  How do rocks and soil form and change?
Science objectives	<u>Animals</u> - identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat <u>Plants</u> - explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant - investigate the way in which water is transported within plants - identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers	- identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers - explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal	- compare and group together different kinds of rocks on the basis of their appearance and simple physical properties - describe in simple terms how fossils are formed when things that have lived are trapped within rock - recognise that soils are made from rocks and organic matter
Substantive knowledge	- Know the role of carbohydrate, protein, fats and vegetables in maintaining a balanced diet. - Know that nutrition provides the body with energy. - Know that animals need to source food from another animals or plant. - Know that plants need nutrients from the soil and room to grow. - Know that different plants need different conditions - Know that water is transported in plants from the roots to the stem and excreted through the leaves. - Know that plants create their own food in the leaves.	- Know that plants mature and create flowers and seeds - Know that the flower attracts pollinators. - Know that pollinators carry pollen from one plant to another causing pollination to occur. - Know that a seed forms as a result of pollination - Know that seeds disperse by wind, explosion, animals and water. - Know that seeds disperse to find room to grow new plants. - Know that the new plants that grow are the offspring of the plant the seed came from.	- Know that rocks can be grouped based on what they look like and how they feel. - Know that different rocks have different properties. - Know that fossils are found in sedimentary rocks - Know that sedimentary rocks are formed of layers. - Know that a fossil is the imprint of something that was once living (plants/animals) - Know that the fossil is the imprint of the hardest material in the living thing - Know that fossils are formed when things that have lived are trapped in layers of rock - Know that organic matter is the remains of something that was once living - When organic matter is subjected to large forces (squashed) it forms a soil

Year 4

Working Scientifically concepts.

Asking and exploring questions 	Making predictions 	Scientific enquiry 	Observing and measuring 	Recording data 	Concluding and evaluating 	Applying scientific knowledge 
"how" questions -Ask relevant questions and using different types of scientific enquiries to answer them - I know that researching involves using secondary sources to find answers to questions - I know that my question is based on my variables - Decide how to gather evidence to answer questions. - Raise questions to help identify and group. - Identify appropriate information from secondary sources to help answer questions.	- Use subject knowledge or research to make predictions. - Raise further predictions from results based on patterns, then make predictions for new values.	- Carry out a range of scientific investigations linked to all types of enquiry. - Identify the type of enquiry needed to answer a question. - Select from a range of resources to perform fair tests. - Plan investigations more independently and choose their own method to carry out an investigation. - Know and give reasons for my choice of enquiry - Identify the control and dependent variables - Recognise a fair test - Know that comparative and fair testing involves exploring cause and effect.	- Know that I observe / measure the dependent variable. - Know that the control variable is the variable that is changing - Make systematic and careful observations and decide how to record them to answer a question. - Collect data from own observations and measurements. - Know that temperature is measured in °C using alcohol and digital thermometers. - Know that force is measures in N using a Newton meter - Know that sound is measure in decibels using dataloggers. - Group objects using classification keys. - Identify differences, similarities or changes related to simple scientific ideas or processes. <i>(KSI Maths Curriculum)</i> -I know that length is measured in m and cm	- Create own tables with own headings.- Know that the dependent variable data is organised in a table. - Produce vertical and horizontal bar charts adding own labels and bars. - Know that the control variable builds the x axis - Know that the dependent variable data is organised on the y axis - Record findings using scientific language, drawings and labelled diagrams. - Record using classification keys and Venn and Carroll diagrams for classification, choosing own criteria. - With support, present the same data in different ways- choice over recording. - Can use discrete and continuous data, presenting data in a line/scatter graph. - Can construct a pictogram/bar chart independently.	- Know how to use tables and bar charts to look for patterns and relationships (cause and effect) and describe these in words. - Know how to use the relationship (cause and effect) or pattern to predict a future change - Use scientific knowledge to explain findings. - Suggest improvements and raise further questions - Use evidence and subject knowledge to refute statements. - Make basic statements about what worked well and what they would change. - Begin to evaluate different aspects of their enquiries such as equipment. - Use different charts to evaluate such as ranking scales, star diagrams and success ladders. - Suggest points for development based on the weakest aspects.	

			<i>using a ruler, tape measure -I know that capacity is measured in ml and L using measuring cylinders -I know that time is measured in mins and sec using a stopwatch -I know that mass is measured in g and Kg using balanced and digital scales -I can read scales in divisions of 1,2,5 and 10.</i>			
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Year 4	Term 1	Term 2	Term 3
Big Idea	Properties of materials – Observe and measure changes of state  How can the state of materials change?	Energy (sound) – Explore how sound energy travels in vibration waves  How do we control sound?	Alive (structure and function) – Identify the structure and function of different parts of the digestive system (including teeth)  What is the function of the digestive system?
Science objectives	- compare and group materials together, according to whether they are solids, liquids or gases - 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) - identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature	- identify how sounds are made, associating some of them with something vibrating. - recognise that vibrations from sounds travel through a medium to 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. - recognise that sounds get fainter as the distance from the sound source increases.	- describe the simple functions of the basic parts of the digestive system in humans - identify the different types of teeth in humans and their simple functions
Substantive knowledge	- Know that materials are made from matter. - Matter is the building blocks of everything. - Know that the three states of matter are solids, liquid and gas. - Know that a solid is a substance that holds its shape. - Know that liquids form a pool not a pile. - Know that gas escape from an unsealed container. - Know that temperature is a measure of the amount of heat (Celsius) - Know that some materials change state when they are heated or cooled - Know that melting is when a solid changes to a liquid and that freezing is when a liquid changes to a solid - Know that materials all have a melting and freezing point - Know that water freezes at 0 degrees and evaporates at 100 - Know that evaporation is when a liquid changes to a gas and that condensation is when a gas changes to a liquid. - Know that the sun's thermal energy evaporates water from the earth's surface. - Know that the water held in clouds cools and condensates back to earth as rain / snow.	- To know that sound is a form of energy. - Know that energy is the ability to do work. This can be in the form of light, heat, sound or movement. - To know that sound occurs due to an object vibrating. - To know that the vibrations of sound travel through solids, liquids and gases to the ear. - To know that the speed of the vibrations changed the pitch. A high-speed vibration causes a higher pitch. - To know that strength of a vibrations causes a louder volume. - To know that a sound gets fainter as the distance from the sound source increases.	- Know that teeth break down food into small swallowable pieces. - Know the function of the molars is to grind food. - Know the function of the canines is to rip food - Know the function of the incisors is to cut food. - Know the oesophagus transports chewed food and liquid to the stomach - Know that the stomach breaks down the chewed food into a liquid - Know that the small intestine allows nutrients to be absorbed into the body. - Know that the function of the large intestine is to absorb water. - Know that the anus allows the body to excrete waste.

	Term 4	Terms 5	Term 6
Big Idea	Alive (structure and function) – Use knowledge of the structure of plants and animals to group them  How can we classify different plants and animals?	Thrive and survive – Construct food chains and reason about the impact of environmental change to thrive and survive.  What allows and prevents animals from thriving and surviving?	Energy – Electricity – Explore the impact of an open and closed circuit on electrical energy.  How does electricity travel?
Science objectives	- recognise that living things can be grouped in a variety of ways - explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment	- Recognise that environments can change and that this can sometimes pose dangers to living things - construct and interpret a variety of food chains, identifying producers, predators and prey	- Identify common appliances that run on 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 that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit - Recognise common conductors and insulators and associate metals with being good conductors
Substantive knowledge	- Know that a classification key is a tool for identifying and grouping based on differences - Classify a variety of living things based on observed characteristics. - Classify plants in flowering and non-flowering plants - Know invertebrates are animals which do not have a backbone, vertebrates do. - Classify animals into vertebrates and invertebrates	- Know that a food chain starts with a producer which gets its energy from the sun. - Know that throughout the food chain, energy is transferred from one living thing to another. - Know that a food chain includes predators who feed on prey. - Construct a food chain containing producers, predators and prey - Know that environmental change can endanger living things in a habitat e.g. global warming and polar bears; deforestation and orangutans; destruction of hedge rows; building of roads and residential areas and the impact on British wildlife.	- To know some common appliances that run on electricity. - To know the basic parts of a circuit: bulb, cells, switch wire buzzer. - To know that a complete circuit is needed to power a component. - To know the impact of a complete and open circuit. - To know that a switch completes and opens a circuit. - To know that electrical insulators do not allow electricity to flow through them. - To know that electrical conductors do allow electricity to flow through them. - To know that metal make good conductors. - To know that a series circuit contains elements in a single complete loop.

Year 5

Working Scientifically concepts

Asking and exploring questions 	Making predictions 	Scientific enquiry 	Observing and measuring 	Recording data 	Concluding and evaluating 	Applying scientific knowledge 
"how and why" questions - Know how to use variables to generate an enquiry question for different enquiry types. - Use their scientific experiences to explore ideas and raise different questions. - Create further questions from enquiries to investigate. - Independently use secondary sources to find relevant facts about a topic. - Relate their results to the enquiry question and state if their test has enabled them to answer it.	- Use subject knowledge, observations, or previous learning to make predictions. - Add further detail and explanations for their predictions when prompted. - Base predictions on previous scientific enquiry. - Know that predictions are based on my scientific knowledge of how variables are likely to behave.	- Plan and perform part of an investigation independently - Design a fair test - Identify how to control variables in different enquiry types. - Explain my choice of enquiry - Identify a range of variables which could affect their investigation.	- Use my knowledge of variables and measures to make reasoned decisions about what to observe and measure and which equipment to use. - Know that systematic observation is based on the control variable - Select measuring equipment to give most precise results. - Know that repeating measurements and observations increases their reliability. <i>(LKS2 Maths Curriculum)</i> - I can read scales that involve decimal numbers and negative numbers.	- I know that scientific diagrams mainly contain labelled features relevant to the variables - Decide how to organise data using my knowledge of control and dependent variables in tables, charts and diagrams. - Present results in a variety of ways to help in answering questions. - Record results systematically, indicating cause and effect. - Produce bar graphs with various increments. - I know that the x axis is the control variable - I know that the y axis is the dependent variable - I know how to use yes no answers to build a classification key	- Use scientific knowledge to question findings and decide when further testing is required. - Know that all results allow me to question and predict, however, not all results are reliable - Evaluate different aspects of their enquiries such as equipment and accuracy of measurements. - Use a range of charts to evaluate such as ranking scales, star diagrams including those with negative numbers. - Suggest next steps based on the weakest aspects and state how this will help them or the test progress or give different results.	

Year 5	Term 1	Term 2	Term 3
Big Idea	Properties of materials – Explain the processes and outcomes of some reversible and irreversible changes which include changes of state  How can changes to materials be reversed?	Forces: contact and non-contact – Identify and explain the effects of unbalanced forces  How can forces cause a change in an object's movement?	Forces: contact and non-contact – Describe the orbits of the earth and moon.  How do forces impact planets and moons?
Science objectives	- compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets - know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution - use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating - give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic - demonstrate that dissolving, mixing and changes of state are reversible changes - explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.	- 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 air resistance, water resistance and friction, that act between moving surfaces - recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.	- describe the movement of the Earth, and other planets, relative to the Sun in the solar system - describe the movement of the Moon relative to the Earth - describe the Sun, Earth and Moon as approximately spherical bodies - use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.
Substantive knowledge	- Know that materials that do not easily change when forces are applied are hard. - Know that materials that allow heat in the form of thermal energy or electrical energy to flow through are conductors. - Know that materials that restrict the flow of thermal energy are called insulators. - To know that the greater the transparency of the material the more light it lets through. - Know that soluble materials are able to be dissolved in a liquid. - Know that a solution contains a liquid and a soluble material. - Know that you can recover a substance from a solution by evaporating off the liquid - Know that some changes are reversible	- Know that gravity is a force that pulls objects towards the earth - Air resistance, water resistance and friction are all contact forces. These occur when things touch. - To know that friction is a force acting between two surfaces. - To know that friction is a type of resistance that slows moving objects down or halt them. - To know that the same object will move differently on different surfaces. - To know that water resistance is the force acting between an object and body of water. - To know that air-resistance is the force acting between an object and a body of air. - Mechanisms help us to move things more easily by multiplying the force. The help us lift, move or turn things with less effort.	- Know that gravity is an attractive force which causes unsupported objects fall to earth. - Know that sun is the centre of our solar system. - Know that the sun's gravitational force cause the planets to orbit it. - Know that the moon orbits the earth. - Know that the moon appears differently in the night sky at different points in its orbit. - Know that sun is a star. - Name the eight planets in the solar system. - Know that earth spins on its axis. - Know that one spin is 24 hours - Know that this causes the surface of the earth to face towards the sun in the day-time and away from the sun at night. - Know that the Earth rotation makes it appear as if the sun is moving across the sky but it is not.

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| | <ul style="list-style-type: none">• Know that some changes are irreversible as a new material is formed.• Know that burning a substance is an irreversible change• Know that mixtures can be separated in different ways, including filtering, sieving, and evaporating• Know that chemical changes which involve acids are irreversible. | | |
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	Term 4	Terms 5	Term 6
Big Idea	Alive (structure and function) – Describe how human structure and function changes as they age.  How does a human's structure and function change as they grow?	Reproduction – Describe and compare the processes of sexual reproduction in some animals  How do different animals reproduce?	Reproduction – Describe and compare the processes of sexual reproduction in some plants.  How do different plants reproduce?
Science objectives	describe the changes as humans develop to old age	- describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird - describe the life process of reproduction in some animals	describe the life process of reproduction in some plants
Substantive knowledge	- Know that babies are dependent upon an adult - Know that a toddler can move around their world. - Know that children grow rapidly - Know that adolescents experience puberty which enables them to reproduce - Know that adults are fully grown human - Know as humans age, their bodies begin to change	- Know the life cycle of a mammal (human) - Know that mammals require sperm from a male to fertilise an ovary from a female. - Know that a fertilised egg grows in the female's uterus until the offspring is ready to be born. - Know that a bird's embryo is grown outside of the female within a protective egg, until it is ready to be hatched. - Know that an amphibian's embryo is laid as soft spawn in water until they are ready to hatch. - Know that amphibian offspring undergo metamorphosis into a mature adult. - Know that insects have four stages within their life cycles – egg, larva, pupa and adult	- Know that plants that reproduce sexually need pollen from a male and female plant. - Know that asexual plants do not require male and female pollen and therefore do not have flowers. - Know that seeds germinate and grow into mature plants.

Year 6

Working Scientifically concepts

Asking and exploring questions 	Making predictions 	Scientific enquiry 	Observing and measuring 	Recording data 	Concluding and evaluating 	Applying scientific knowledge 
"how and why" questions - Know how to use variables to generate an enquiry question for different enquiry types. - Can raise questions about a range of phenomena. - Can ask questions about a range of materials in order to support classification. - Can raise questions to further prove a scientific enquiry. - Pose and answer own questions, controlling variables where necessary independently	- Develop predictions not just based on results of a scientific enquiry but using own ideas and subject knowledge. - Use evidence to support predictions. - Gather evidence through practical science to support predictions. - Use test result to make predictions to set up further comparative and fair tests. - Know that predictions are based on my scientific knowledge of how variables are likely to behave.	- Plan and perform part of an investigation independently - Design a fair test - Identify how to control variables in different enquiry types. - Choose the type of enquiry needed to carry out an investigation and explain my choice of enquiry. - Identify a range of variables which could affect their investigation. - Understand how to gather data to prove a prediction. - Identify a range of factors which may affect their investigation.	- Use my knowledge of variables and measures to make reasoned decisions about what to observe and measure and which equipment to use. - Know that systematic observation is based on the control variable - Select measuring equipment to give most precise results. - Take measurements, using a range of scientific equipment, with increasing accuracy and precision. - Record measurements to 3dp. - Know that repeating measurements and observations increases their reliability. - Observe and raise questions about animals and how they are adapted to their environment. <i>(LKS2 Maths Curriculum)</i> - I can read scales that involve decimal numbers and negative numbers.	Present the same data in different ways to help answering the question. Record data and results with increasing complexity. - Know that scientific diagrams mainly contain labelled features relevant to the variables - Know how to organise data using my knowledge of control and dependent variables in tables, charts and diagrams. - Independently collect data and produce scatter and line graphs using various scales and - Know that a line graph represents changes over time. - Know that the x axis is the control variable - Know that the y axis is the dependent variable - Know how to use yes no answers to build a classification key <i>(UKS2 Maths Curriculum)</i> - calculate the mean and range of a set of data. - Draw and interpret line graphs	- Use scientific knowledge to question my findings and decide when further testing is required. - Know that all results allow me to question and predict, however, not all results are reliable - Describe and evaluate own and other people's scientific ideas using evidence from a range of sources. - Evaluate own choice of method, the control of variables, the precision and accuracy of measurements and the credibility of secondary sources. - Use scientific language and evaluate how enquiry has answered the question.	

Year 6	Term 1	Term 2	Term 3
Big Idea	Alive (structure and function) – Identify the structure and function of main different parts of the human circulatory system. 	Alive (structure and function) – Use knowledge of structure and function of plants and animals to classify them in broad groups 	Thrive and survive – Recognise ways in which humans can support or hinder their ability to thrive. 
Science objectives	What happens in my body to enable it to thrive? • Know the names and location of the parts of the circulatory system: heart, lungs, mouth and nose, blood vessels and blood • identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood • describe the ways in which nutrients and water are transported within animals, including humans	How can classification help us to identify species? • describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals • give reasons for classifying plants and animals based on specific characteristics.	What can hinder my body's ability to thrive and survive? • recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function
Substantive knowledge	• Know that the function of the heart is to pump blood around the body. • Know that the function of the lungs is to bring oxygen into the body and excrete carbon dioxide • Know that carbon dioxide is waste product • Know that blood vessels transport the blood to all areas of the body. • Know that blood carries oxygen, CO₂, water and nutrients.	• Know the difference between a plant, micro-organisms and an animal • Know the difference between flowering plants and non-flowering plants • Know the difference between vertebrates and invertebrates • Know the 5 classifications of vertebrates: mammals, birds, fish, amphibians and reptiles. • Know that invertebrates can be worms, insects and spiders • describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals • give reasons for classifying plants and animals based on specific characteristics.	• Know that an unbalanced diet leads to poor health • Know that exercise leads to greater well-being both physically and mentally • Know that some drugs can be harmful to the human body, e.g. caffeine, nicotine, alcohol, cannabis

	Term 4	Term 5	Term 6
Big Idea	Diversity – Identify adaptations and its role in evolution How have adaptations allowed living things to survive and thrive? 	Energy - light – Explore how light energy travels in straight lines How does light allow us to see? 	Energy – electricity – Explore the impact of varying voltage in a circuit How can we control electricity? 
Science objectives	- recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. - recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents - identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.	- recognise that light appears to travel in straight lines - use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye - explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes - use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them	- associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit - compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches - use recognised symbols when representing a simple circuit in a diagram.
Substantive knowledge	- Know that animal offspring are similar to, but not identical to their parents. - Know that fossils are evidence of the plants and animals alive millions of years ago. - Know that characteristics are passed to offspring from their parents. - Know that animals and plants have characteristics that are suited to the habitat in which they live. - Know that overtime, animals and plants adapt to suit their environment. - Know that adaptations can be passed from offspring to offspring over many years. - Know that adaptations passed through many offspring result in permanent change which is called evolution.	- Know that light appears to travel in straight lines - Know that light can travel directly to the eye. - Know that light can travel from a source to an object and then reflect from the object into the eye. - Know that light can be reflected into the eye - Know that shadows are the same shape as objects because light travels in straight lines.	- To know that voltage is an electrical force. - To know that the more volts the bright / louder the component. - To know that a cell is 1.5v - To know that a battery is multiple cells. - To know that in a circuit with a fixed voltage, the more components the quieter, dimmer the component. - To know the recognised circuit symbols for switch, cell, bulb, buzzer and switch.