

St Mark's All-Through Curriculum Map for Science (KS1 – 2)

	Autumn	Spring		Summer
EYFS	Content <ul style="list-style-type: none"> • Expanding science capital: Children are exposed to scientists through stories and play e.g. what's it like to be an astronaut? • Children talk about some of the things they have observed in their environment such as plants, animals, natural and found objects. <ul style="list-style-type: none"> • Children talk about why things happen and how things work in the context of practical activities. • Children observe things closely through a variety of means, including magnifiers and photographs. • Children examine change over time, for example, growing plants and animals, and changes that may be reversed, e.g. melting ice. <ul style="list-style-type: none"> • Children can look closely at similarities, differences, patterns and change in the context of practical activities. 			
	Progression in Working Scientifically at a Year R level: <p>Planning</p> <ul style="list-style-type: none"> -Being curious and start to ask questions <p>Enquiring and Testing</p> <ul style="list-style-type: none"> -Performing simple tests and using equipment -sorting and matching things <p>Observing and recording</p> <ul style="list-style-type: none"> -using senses to observe and look closely -looking closely at things and noticing changes -making simple records of what I have done and noticed <p>Evaluating and communicating</p> <ul style="list-style-type: none"> -talking about what I have done and noticed -finding things that are similar and different 			
	Understanding the World: The Natural World <p>The science curriculum for Year R at St Mark's is one part of the ongoing curriculum for Understanding the World (UW).</p> <p>Early Learning Goal: Explore the natural world around them, making observations and drawing pictures of animals and plants.</p> <p>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. Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.</p>			
	Autumn 1 Show care and concern for living things and the environment.	Autumn 2 Can describe the similarities and differences between materials.	Spring 1 Can describe the similarities and differences between materials	Spring 2 Has Developed an understanding of growth and change through animal life cycles, and plant growth.

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	<p>Children can use all 5 senses to explore a range of natural materials. Children can identify and observe the weather for autumn.</p> <p>Living Things - lifecycle of a butterfly -Exploring natural materials</p> <p>Seasonal Changes -Using our 5 senses to explore -Autumn Study - record and observe</p>	<p>Children can explore and talk about the different forces they feel (floating and sinking). Children can identify and observe the weather for winter and explain how it has changed.</p> <p>States of Matter -save the penguin from the ice.</p> <p>Forces -Floating and Sinking</p> <p>Seasonal Changes -Using our 5 senses to explore -Winter Study - record and observe</p>	<p>and changes they notice (Natural and man-made).</p> <p>Materials -Den for a bear that stays dark (light and shadows)</p> <p>Living Things -bear poo observations -herbivore and carnivore</p>	<p>Understands the need to respect and care for the natural environment and all living things. Children can identify and observe the weather for spring and explain how it has changed.</p> <p>Living Things -animals and what they need to grow -life cycles of a chick, sheep etc. -Life cycle of a plant e.g. growing crops on the farm e.g. cress, bean sprouts etc.</p>	<p>Seasonal Changes -Using our 5 senses to explore -Summer Study - record and observe</p> <p>Materials -materials: best material for boat building, does it float or sink.</p> <p>Living Things -How do humans grow?</p>
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Year 1

Curriculum Content (Core Knowledge and Vocabulary outlined on the Knowledge Organiser).

Progression in Working Scientifically at a Year 1 level:

Planning

-Explore the world around them and start to ask simple questions and recognising different ways they may be answered

Enquiring and Testing

-carry out simple tests

-use simple features to compare objects, materials and living things and **with support** decide how to sort and group (identify and classify)
-ask people questions and use secondary sources to find answers

Observing and recording

- **with support**, observe closely, using simple equipment (include observing changes over time).

-Use simple measurements and equipment to gather data (non standard measurements such as multilink, body parts), rulers, magnifying glasses and pipettes
-Record simple data (Venn diagrams, tally charts and observational drawings)

Evaluating and communicating

-Use their observations and ideas to suggest answers to questions

-Talk about what they have found out and how they found it out.

-With help, record and communicate their findings in a range of ways, beginning to use scientific language (using given stem sentences)

Core Disciplinary Vocabulary

Observe, changes, patterns, grouping, sorting, compare, same, different, bigger, smaller, tallest, largest, identify (name), ask questions, explore, equipment, magnifying glass, pipette, ruler, answer questions, measure, drawing, picture, prediction, conclusion..

Year 1	<p>NB. To be taught throughout the year and bridged between science and geography learning.</p> <p><u>Living Things and their habitats (1.1)</u></p> <p>Seasonal Changes -observe changes across the 4 seasons -observe and describe weather associated with the seasons and how day length varies -Consider and review how plants change over time and link this to seasonality</p> <p>Working Scientifically: Observing over Time: - making displays of what happens in the world around them, including day length, as the seasons change Survey/Pattern seeking: -Can collect information to classify weather and day length in different seasons and present the information in tables or charts to compare the seasons.</p> <p>Link to prior learning EYFS observations of environments. Future learning 1.4, 1.5</p>		
	Autumn Year 1	Spring Year 1	Summer Year 1
	<p><u>Autumn 1: Animals including Humans (animals focus) (1.1)</u></p> <p>-identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals</p> <p>-identify and name a variety of common animals that are carnivores, herbivores and omnivores</p> <p>-describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets)</p> <p>Working Scientifically: Classifying and Grouping:</p>	<p><u>Spring 1: Animals including Humans (humans focus) (1.3)</u></p> <p>-identify, name, draw and label the basic parts of the human body (including head, neck, arms, elbows, legs, knees, face, ears, eyes, hair, mouth, teeth) and say which part of the body is associated with each sense</p> <p>Working Scientifically: What are bodies and what can they do? -using their senses to compare different textures, sounds and smells. Future Learning: 2.1, 3.2, 4.1, 7.9</p> <p>Enquiry questions: Who has the biggest feet in our class?</p>	<p><u>Summer 1: Plants (1.5)</u></p> <p>- identify and name a variety of common wild and garden plants, including deciduous and evergreen trees</p> <p>- identify and describe the basic structure of a variety of common flowering plants, including trees (leaves, flowers, petals, fruit, roots, bulb, seed, trunk, branches, stem)</p> <p>Working Scientifically: Observing over Time: -Observe the growth of flowers/vegetables they have planted and Record how plants change over time (beans linking to Jack and the Beanstalk)</p>

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	<p>How can we group different animals?</p> <p>-using their observations to compare and contrast animals at first hand or through videos and photographs, describing how they identify and group them; -grouping animals according to what they eat;</p> <p>Link to prior learning EYFS observations of natural environments.</p> <p>Future Learning: 2.1, 4.1, 4.3</p>		<p>Survey/Pattern seeking:</p> <p>-collect information and identify plants in open space (simple charts).</p> <p>Enquiry questions: How will the plant change over time?</p> <p>Link to prior Autumn/Spring/Summer work outdoors and observations. Opportunity to consolidate seasonal learning.</p> <p>Future Learning: 2.4, 3.3, 4.3</p>
<p>Year 1</p>	<p><u>Autumn 2: Materials Everyday Materials (1.2)</u></p> <p>-distinguish between an object and the material from which it is made</p> <p>-identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, rock, brick, paper, fabrics, elastic, foil</p> <p>-describe the simple physical properties of a variety of everyday materials hard/soft; stretchy/stiff; shiny/dull; rough/smooth; bendy/not bendy; waterproof/not waterproof; absorbent/not absorbent; opaque/transparent</p> <p>-compare and group together a variety of everyday materials on the basis of their simple physical properties</p> <p>Working Scientifically: What are things made of and why?</p> <p>Classifying and Grouping: -compare and group materials based on their simple properties</p>	<p><u>Spring 2: Living Things and their habitats (Spring) (1.4)</u></p> <p>Seasonal Changes</p> <p>-observe changes across the 4 seasons -observe and describe weather associated with the seasons and how day length varies -Consider and review how plants change over time and link this to seasonality</p> <p>Working Scientifically: Observing over Time: - making displays of what happens in the world around them, including day length, as the seasons change</p> <p>Survey/Pattern seeking: -Can collect information to classify weather and day length in different seasons and present the information in tables or charts to compare the seasons.</p> <p>Enquiry questions: What is the weather like in Autumn/Winter/Spring and Summer?</p> <p>Link to prior learning EYFS observations of environments.</p> <p>Future learning (1.5)</p>	

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	<p>Comparative Testing: -Which is the best material for a boat?</p> <p>Enquiry questions: Which material will protect my picture? Which material is the best to build a boat with?</p> <p>Link to prior learning EYFS observations of materials in natural environments, floating and sinking.</p> <p>Future Learning 2.2, 5.3</p>		
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Year 2

Curriculum Content (Core Knowledge and Vocabulary outlined on the Knowledge Organiser).

Progression in Working Scientifically at a Year 2 Level

Planning

-Explore the world around them and start to ask simple questions and recognising different ways they may be answered

Enquiring and Testing

-carry out simple tests

-use simple features to compare objects, materials and living things and decide how to sort and group (identify and classify)

-ask people questions and use secondary sources to find answers

Observing and recording

- observe closely, using simple equipment (such as pipettes, beakers, stopwatches, rulers, choice chamber).

-Use simple measurements and equipment to gather data (pipette drops, seconds, standard measurements, cm)

-Record simple data (venn diagrams, tally charts, tables, bar charts)

Evaluating and communicating

-Use their observations and ideas to suggest answers to questions

-Talk about what they have found out and how they found it out.

- record and communicate their findings in a range of ways, beginning to use scientific language - form a written conclusion. 'I think this happened because...' Start to form very simple evaluations 'I was surprised/amazed because...'

Core Disciplinary Vocabulary

Data, record results, table, tally chart, pictogram, bar chart, Venn diagram, test, investigate, interpret results, pipette, beaker, stopwatch, choice chamber, ruler, heart rate, prediction, conclusion

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Year 2	Autumn Year 2	Spring Year 2	Summer Year 2
	<p><u>Autumn 1: Animals including Humans (2.1)</u></p> <p>-Recap and review year 1 knowledge of basic parts of the human body including senses (Year 1 KO – 1.3)</p> <p>-notice that animals, including humans, have offspring which grow into adults e.g. recognition of growth in egg chick, spawn-tadpole, baby, toddler, child, teenager, adult.</p> <p>-find out about and describe the basic needs of animals (review year 1 vocabulary), including humans, for survival (water, food and air)</p> <p>-describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene</p> <p>Working Scientifically:</p> <p>Classifying and Grouping:</p> <p>-Classifying foods as healthy and unhealthy</p> <p>Survey and Pattern Seeking:</p> <p>-Exploration of what humans need to stay healthy (exercise)</p> <p>Secondary Sources: VISIT</p> <p>-Choice of question to research: How to look after a _____</p> <p>children pose questions to a visitor who has recently had a baby/has a pet etc that can be brought in to school - suggesting ways to find answers to their questions</p> <p>Enquiry questions:</p> <p>Which activities make our heart rates increase the most?</p> <p>Future Learning – In preparation for key stage 2: 3.2, 4.1</p>	<p><u>Spring 1: Scientists Inventors (2.3)</u></p> <p>Review Materials knowledge from autumn KO (2.2), and Year 1 KO (1.2)</p> <p>-Find out about people who have developed useful new materials, for example John Dunlop, Charles Macintosh or John McAdam.</p> <p>- Explore how materials have changed over time e.g. sheep wool and fleece</p> <p>Working Scientifically:</p> <p>Comparative Testing:</p> <p>-best material for a waterproof coat</p> <p>- best material for a teabag investigation</p> <p>Enquiry questions:</p> <p>Which material is the most suitable for a waterproof coat? Which material is the most suitable for a teabag?</p> <p>Links forward to grow students' science capital across the school and tackle pre-conceived perceptions of who can be a scientist. This unit focuses on the application of working scientifically skills to enable the children to see themselves as scientists ready for key stage 2.</p>	<p><u>Summer 1:</u></p>

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Year 2	<p><u>Autumn 2: Use of Everyday Materials (2.2)</u></p> <p>Recap year 1 knowledge of identifying everyday materials (Year 1 KO – 1.2)</p> <p>- identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. - some materials are used for more than one thing - different materials can be used to make the same thing - suitability of materials based on their properties -find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching</p> <p>Working Scientifically:</p> <p>Classifying and Grouping: -observing closely, identifying and classifying the uses of different materials, and recording their observations. Survey/Pattern Seeking: -investigating how materials can be shaped</p> <p>Enquiry questions: Which material is the most absorbent?</p> <p>Future Learning – In preparation for key stage 2 5.3</p>	<p><u>Spring 2: Plants 2.4</u></p> <p>Recap year 1 knowledge of plant structure (1.5): (leaves, flowers, petals, fruit, roots, bulb, seed, trunk, branches, stem) (Check Year 1 KO)</p> <p>-observe and describe how seeds and bulbs grow into mature plants (seeds and bulbs need water to grow but most do not need light; seeds and bulbs have a store of food inside them).</p> <p>-find out and describe how plants need water, light and a suitable temperature to grow and stay healthy</p> <p>Working Scientifically:</p> <p>Observing over Time: -observe and record, with some accuracy, the growth of broad beans as they change over time from a seed</p> <p>Comparative Testing: -comparative test to show that plants need light and water to stay healthy.</p> <p>Enquiry questions: Which environment is the best for a plant to grow healthily? Future Learning – In preparation for key stage 2: 3.3, 4.3</p>	<p><u>Summer 2: Living Things and their habitats (2.5)</u></p> <p>Recap year 1 knowledge of carnivores, herbivores and omnivores (Year 1 - 1.1 KO) and plant knowledge (2.4) from previous unit.</p> <p>-explore and compare the differences between things that are living, dead, and things that have never been alive</p> <p>-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</p> <p>-identify and name a variety of plants and animals in their habitats, including microhabitats</p> <p>- Compare familiar habitats with non-familiar habitats</p> <p>-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</p> <p>Working Scientifically:</p> <p>Classifying and Grouping: -sorting and classifying things according to whether they are living, dead or things that were never alive, and recording their findings</p> <p>Survey/Pattern Seeking: - Exploring two contrasting habitats. Describe the conditions in different habitats and microhabitats (under log, on stony path, under bushes); and find out how the conditions affect the number and type(s) of plants and animals that live there.</p> <p>Using Secondary Sources: -Research creatures that live in certain habitats and design own creature that would be suitable.</p> <p>Enquiry questions: Which environment is the most suitable for a woodlouse? Future Learning – In preparation for key stage 2</p>
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Year 3

Curriculum Content (Core Knowledge and Vocabulary outlined on the Knowledge Organiser).

Progression in Working Scientifically at a Year 3 Level

Planning

- Raise their own relevant questions about the world around them.
- Start to make their own decisions about appropriate scientific enquiry
- Talk about criteria for grouping, sorting and classifying.

Enquiring and Testing

- set up practical, comparative and fair tests (fair testing new from key stage 1).

Observing and recording

- Make systematic and careful observations, making decisions about what to look for, for how long, and the equipment that might be used (torches, rock samples, pipettes, data logger, petri dishes, goggles, magnets, Newton metres, magnifying glasses).
- Take accurate measurements using standard units and new equipment (cm with a ruler, ml, cm and m with trundle wheels, newton metres)
- Collect and record data in a variety of ways (venn diagrams, tables, observational drawings)

Evaluating and communicating

- With help look for changes, patterns, similarities and differences in their data to draw simple conclusions and answer questions (start to form simple comparative statements 'The ___er the ___ the ___er the ___')
- Use relevant scientific language to discuss their ideas and communicate findings in appropriate ways
- With support, identify new questions arising from the data, making predictions within or beyond

Core vocabulary

fair testing, relationships, accurate, data logger, stopwatch, timer, estimate, data, diagram, prediction, similarity, difference, evidence, prediction, conclusion, evaluation, sample, pipettes, petri dishes, goggles, magnifying glasses, newton metres, torches, magnets, data loggers.

<p>Year 3</p>	<p><u>Autumn 1: Light (3.1)</u></p> <ul style="list-style-type: none"> - 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 	<p><u>Spring 1: Plants 3.2</u></p> <ul style="list-style-type: none"> Recall parts of plants from year 1 and 2 (1.5 and 2.4) KOs ready to make the link between structure and function -identify and describe the functions of different parts of flowering plants: roots, stem/trunk (nutrition and support), leaves (nutrition) and flowers (reproduction) -explore the requirements of plants for life and growth (air, light, water YEAR 2 KO, nutrients from soil, and room to grow) 	<p><u>Summer 1: Rocks 3.4</u></p> <ul style="list-style-type: none"> Recall Year 2 knowledge of everyday materials and their uses such as wood, metal, plastic, glass, brick, rock, paper and cardboard (Year 2 – 2.2 KO) -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
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<p>Year 3</p>	<p>Working Scientifically: Pattern Seeking/Survey: -look for and measure shadows to find out how they are formed and why they might change when the light source moves/distance between light source changes.</p> <p>Comparative and fair Testing -investigate transparent/opaque materials</p> <p>Enquiry questions: How does the type of material affect the amount of light let through? How does the distance from a light source to an object affect the size of the shadow?</p> <p>Future Learning: Forward Links to 6.3, 7.8</p>	<p>and how they vary from plant to plant</p> <p>-investigate the way in which water is transported within plants</p> <p>-explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal</p> <p>Working Scientifically: Comparative and Fair Testing & Observation over time: - compare the effect of different factors on plant growth, for example, the amount of light, the amount of fertiliser.</p> <p>Observation over time: - observing how water travels up the stem to the flowers (celery investigation).</p> <p>Secondary Sources: -research how requirements vary from plant to plant</p> <p>Enquiry questions: Which conditions do plants need to grow healthily?</p> <p>Future Learning: Forward links to 4.3, 7.3</p>	<p>Working Scientifically: Observing over time: -observing rocks, including those used in buildings and gravestones, and exploring how and why they might have changed over time Classifying and Grouping: -observe, classify and group rocks in a variety of different ways (grains, crystals or fossils)</p> <p>Secondary Sources: -explore how fossils are formed.</p> <p>Comparative Testing – How are soils formed? - Pupils could explore different soils and identify similarities and differences between them</p> <p>Enquiry questions: Which soil will be the best at absorbing water?</p> <p>Bridging between learning in science and geography (extreme earth). Future Learning: Forward Links to 6.5</p>
		<p><u>Spring 2: Animals Including Humans 3.3</u></p> <p>-identify that animals, including humans, need the right type of foods (review from year 2 2.1 KO) and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat -identify that humans and some other animals have skeletons and muscles for support, protection and movement</p> <p>Working Scientifically: Classifying and Grouping: -identifying and grouping animals with and without skeletons</p> <p>Survey/Pattern seeking: -Investigating body proportions</p> <p>Classifying and Grouping: -compare and contrast the diets of different animals (including their pets) and decide ways of grouping them according to what they eat. Secondary Sources: -Research nutrition of restaurant/takeaway meals and design meals based on what they find out.</p>	<p><u>Summer 2: Forces and Magnets 3.5</u></p> <p>-compare how things move on different surfaces</p> <p>-notice that some forces need contact between 2 objects, but magnetic forces can act at a distance</p> <p>-observe how magnets attract or repel each other and attract some materials and not others (example, bar, ring, button and horseshoe)</p> <p>-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</p> <p>-describe magnets as having 2 poles</p> <p>-predict whether 2 magnets will attract or repel each other, depending on which poles are facing</p> <p>Working Scientifically:</p>

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<p>Year 3</p>		<p>Enquiry questions: Does the length of your arm affect how far you can throw something?</p> <p>Future Learning: Forward Links to 4.1, 4.3, 6.4, 7.9</p>	<p>Comparative and Fair Testing: - raising questions and carrying out tests to find out how far things move on different surfaces, and gathering and recording data to find answers to their questions;</p> <p>-exploring the strengths of different magnets and finding a fair way to compare them;</p> <p>Classifying and Grouping: -sorting materials into those that are magnetic and those that are not;</p> <p>Enquiry questions: Which surface needs the most force to move an object across it? Future Learning: 5.2, 5.3</p>
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<p>Year 4</p>	
<p>Curriculum Content (Core Knowledge and Vocabulary outlined on the Knowledge Organiser).</p>	
<p>Progression in Working Scientifically at a Year 4 Level</p> <p>Planning</p> <ul style="list-style-type: none"> -Raise their own relevant questions about the world around them. - Make their own decisions about appropriate scientific enquiry -Talk about criteria for grouping, sorting and classifying using simple keys <p>Enquiring and Testing</p> <ul style="list-style-type: none"> - set up practical, comparative and fair tests. Recognising when a fair test is necessary. -Recognise when and how secondary sources might answer their questions where practical investigations cannot. <p>Observing and recording</p> <ul style="list-style-type: none"> -Make systematic and careful observations, making decisions about what to look for, for how long, and the equipment that might be used (beakers, bunsen burner, metal mesh, dish, wires, battery, crocodiles clip, motors, buzzers, bulbs, propellers, tuning forks). -Take accurate measurements using standard units and new equipment (cm with a ruler, seconds with a stopwatch, watts) <p>Evaluating and communicating</p> <ul style="list-style-type: none"> -Look for changes, patterns, similarities and differences in their data to draw simple conclusions and answer questions -Use relevant scientific language to discuss their ideas and communicate findings in appropriate ways (venn diagrams). -Identify new questions arising from the data, making predictions within or beyond <p>Core disciplinary vocabulary in Year 3</p>	

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Findings, properties, characteristics, Venn diagrams, Bunsen burner, battery, motors, buzzers, bulbs, propellers, wattage, tuning forks, classification keys, chart, criteria, evidence, prediction, conclusion, evaluation, explanation, reason, improve.

<p>Year 4</p>	<p><u>Autumn 1: Animals including Humans (4.1)</u></p> <p>Review and recap year 3 knowledge of the human body (skeletons and muscles for support, protection and movement) Year 3 – 3.2 – KO</p> <p>-describe the simple functions of the basic parts of the digestive system in humans (mouth, tongue, teeth, oesophagus, stomach, and small and large intestine and their functions)</p> <p>-identify the different types of teeth in humans and their simple functions</p> <p>-construct and interpret a variety of food chains – year 1 knowledge of carnivore, omnivore and herbivore, identifying producers, predators and prey</p> <p>Working Scientifically:</p> <p>Comparative and fair Testing: - finding out what damages teeth and how to look after them – tooth decay experiment</p> <p>Secondary Sources: -raising and answering questions based on the diets of different animals.</p> <p>Enquiry questions: How do different liquids affect the rate at which an egg decay? Future Learning: Forward Links to 7.9</p>	<p><u>Spring 1: Living things and their habitats (4.3)</u></p> <p>Review Year 2 (2.5) knowledge of habitats and micro-habitats and Year 3 knowledge of skeletal classification (3.2).</p> <p>-recognise that living things can be grouped in a variety of ways</p> <p>-explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment (animals, flowering plants and non-flowering plants) e.g. vertebrate and invertebrates</p> <p>-recognise that environments can change (habitats across the year) and that this can sometimes pose dangers to living things</p> <p>Review knowledge on climate change topic here to explore examples of human impact (both positive and negative) on environments.</p> <p>Working Scientifically:</p> <p>Classifying and Grouping: -using and making simple guides or keys to explore and identify local plants and animals;</p> <p>Future Learning: Forward Links to 6.1, 6.4</p>	
	<p><u>Autumn 2: States of Matter (4.2)</u></p> <p>-compare and group materials together, according to whether they are solids(hold their shape), liquids (form a pool not a pile) or gases (escape from an unsealed container)</p> <p>-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) Avoid chemical changes e.g. baking or burning.</p>	<p><u>Spring 2: Electricity (4.4)</u></p> <p>-identify common appliances that run on electricity</p> <p>-construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers (Draw as a pictorial representation)</p> <p>-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</p>	<p><u>Summer 2: Sound (4.5)</u></p> <p>-identify how sounds are made, associating some of them with something vibrating</p> <p>-recognise that vibrations from sounds travel through a medium to the ear</p> <p>-find patterns between the pitch of a sound and features of the object that produced it</p> <p>-find patterns between the volume of a sound and the</p>

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<p>Year 4</p>	<p>-identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature</p> <p>Working scientifically:</p> <p>Classifying and Grouping: -grouping and classifying a variety of different materials as solids, liquids or gases</p> <p>Observation over time: -chocolate melting -ice melting</p> <p>Comparative and fair Testing: -evaporation washing experiment</p> <p>Enquiry questions: Does the size of a chocolate button affect the speed at which it melts? Will damp items that are larger, dry at a different rate from smaller items?</p> <p>Bridging between learning in science and geography (climate change). Future Learning: 5.3, 7.2, 7.4</p>	<p>-recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit</p> <p>-recognise some common conductors and insulators, and associate metals with being good conductors</p> <p>-Explore the work of a famous scientist (Thomas Edison) Working Scientifically:</p> <p>Classifying and Grouping: -Electrical appliances vs non-electrical appliances</p> <p>Comparative and fair Testing: -that metals tend to be conductors of electricity, some materials can and some cannot be used to connect across a gap in a circuit.</p> <p>Enquiry questions: How does the conductivity of an item affect the function of a circuit? Bridging between learning in science and DT (motorised buggies). Future Learning: 5.3, 6.2, 7.4</p>	<p>strength of the vibrations that produced it</p> <p>-Find out how pitch and volume of sounds can be changed in a variety of ways</p> <p>-recognise that sounds get fainter as the distance from the sound source increases</p> <p>Working Scientifically: Survey/Pattern seeking: -finding patterns in the sounds that are made by different objects such as saucepan lids of different sizes or elastic bands of different thicknesses or length.</p> <p>Survey/Pattern seeking: -changing sounds with distance</p> <p>Enquiry questions: How does the position affect the pitch of the sound? How does the distance of a sound source affect the volume of sound? How does the amount of force applied to an object affect the vibration? Future Learning: Forward Links to 7.8</p>
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Year 5

Curriculum Content (Core Knowledge and Vocabulary outlined on the Knowledge Organiser).

St Mark's All-Through Curriculum Map for Science (KS1 – 2)

Progression in Working Scientifically at a Year 5 Level

Planning

- Use their science experiences and knowledge to explore ideas and raise different kinds of questions.
 - Talk about how scientific ideas have developed over time

- Select and plan the most appropriate type of scientific enquiry and use to answer scientific questions

Enquiring and Testing

- Recognise when and how to set up comparative and fair tests and explain which variables need to be controlled and why

Observing and recording

- Make own decisions about what observations to make, what measurements to use and how long to make them for.(mins/secs, newtons, cm/mm, km, mass, ml, days/months/years.) -Choose the most appropriate equipment to make measurements with increasing precision and explain how to use it accurately. Take repeat measurements where appropriate. (solar system model, newton metres, measuring cylinders, stopwatches, beakers, pipettes)

- Decide how to record data and results of increasing complexity from a choice of familiar approaches: scientific diagrams, classification keys, tables, bar and line graphs - (line graph, bar graph, tables, venn diagrams)

Evaluating and communicating

- Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas
 - report conclusions, causal relationships and explanations of degree of trust in results
- Use results to make predictions and identify when further observations, comparative and fair tests might be needed

Core Disciplinary vocabulary

Variables, independent variable, dependent variable, control variable, evidence, justify, argument, , causal relationship, accuracy, precision, bar graphs, line graphs, newton meter, beaker, pipette, measuring cylinder, classification keys)

St Mark's All-Through Curriculum Map for Science (KS1 – 2)

Year	<u>Autumn 1: Earth and Space (5.1)</u>	<u>Spring Term: Properties and Changes of Materials (5.3)</u>	<u>Summer 1: Living Things and Their Habitats (5.4)</u>
5	<p>-describe the movement of the Earth and other planets relative to the sun in the solar system to help them explain day and night</p> <p>KNOW that the sun is a star at the centre of our solar system and that it has 8 planets: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune (Pluto was reclassified as a 'dwarf planet' in 2006)</p> <p>-describe the movement of the moon relative to the Earth. KNOW that a moon is a celestial body that orbits a planet (Earth has 1 moon; Jupiter has 4 large moons and numerous smaller ones).</p> <p>-describe the sun, Earth and moon as approximately spherical bodies</p> <p>use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky</p> <p>-consider the work of scientists such as Ptolemy, Alhazen and Copernicus. How have ideas of the solar system developed from geocentric to heliocentric?</p> <p>Working Scientifically:</p> <p>Secondary Sources:</p> <ul style="list-style-type: none"> -creating simple models of the solar system; - consider work of scientists such as Ptolemy, Alhazen and Copernicus 	<p>-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 (review year 3 magnet knowledge - 3.5) (review year 4 electricity knowledge (4.4)</p> <p>-know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution</p> <p>-use knowledge of solids, liquids and gases (check year 4 – 4.2 KO) to decide how mixtures might be separated, including through filtering, sieving and evaporating</p> <p>-give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic</p> <p>-demonstrate that dissolving, mixing and changes of state are reversible changes</p> <p>-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 (vinegar) on bicarbonate of soda</p> <p>-Explore how chemists create new materials e.g. Spencer Silver, who invented the glue for sticky notes or Ruth Benerito, who invented wrinkle-free cotton.</p> <p>Working scientifically:</p> <p>Classifying and Grouping:</p> <ul style="list-style-type: none"> -compare and group materials based on their properties <p>Comparative and fair Testing:</p> <ul style="list-style-type: none"> -dissolving investigation <p>Observation over time:</p> <ul style="list-style-type: none"> -demonstrate that changes of state are reversible changes. <p>Enquiry questions:</p> <p>If we change the material, what happens to the time taken for the ice capsule to melt?</p>	<p>-describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird (classes reviewed from year 1 – 1.1).</p> <p>-They should find out about the work of naturalists and animal behaviourists, for example, David Attenborough and Jane Goodall</p> <p>-describe the life process of reproduction in some plants and animals. Pupils should find out about different types of reproduction, including sexual and asexual reproduction in plants, and sexual reproduction in animals.</p> <p>Working Scientifically:</p> <p>Secondary Sources:</p> <ul style="list-style-type: none"> -research and compare the life cycles of different animals <p>Survey/Pattern seeking:</p> <ul style="list-style-type: none"> -Look for patterns in given data about gestation periods of animals – see ASE materials. <p>Observation over time:</p> <ul style="list-style-type: none"> - try to grow new plants from different parts of the parent plant (root cuttings) <p>Enquiry questions:</p> <p>How does the size of the animal affect the duration of gestation? Future Learning: Forward Links to 7.7</p>

St Mark's All-Through Curriculum Map for Science (KS1 – 2)

		<p>If we change the material, what happens to the amount of water absorbed? Which materials do you think would dissolve in water?</p> <p>Shorter term and a more detailed topic content. Spread over two terms to provide opportunities for further Working Scientifically.</p> <p>Future Learning: Forward Links to 7.2, 1.10</p>	
<p>Year 5</p>	<p>Autumn 2: Forces (5.2)</p> <p>Review Year 3 forces and magnets knowledge – 3.5 KO.</p> <ul style="list-style-type: none"> -explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. Study the work of Galileo and Newton to develop the theory of gravitation -identify the effects of air resistance, water resistance and friction (Year 3 KO), that act between moving surfaces -recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect <p>Working Scientifically: Comparative and fair Testing:</p> <ul style="list-style-type: none"> - Friction – cars and movement investigation – need to check progression from year 3 -Air Resistance (parachutes) -Water resistance (plasticine) <p>Enquiry questions: If we change the material, what happens to the amount of friction? If we change the size of the parachute, what happens to the time it takes to fall?</p> <p>Bridging between learning in science and DT (fairground mechanisms). Review Year 4 electricity prior to the DT unit – check the KO –</p>	<p>Spring Term: Properties and Changes of Materials continued (5.3)</p>	<p>Summer 2: Animals including Humans (5.5)</p> <ul style="list-style-type: none"> -describe the changes as humans develop to old age. -Timeline growth and development in humans -Learn about the changes experienced in puberty <p>Working Scientifically:</p> <ul style="list-style-type: none"> - Secondary Sources: -researching the gestation periods of other animals and compare them with humans- follow up from summer 1 unit <p>Bridging between learning in science and PSHRE - statutory yet sensitive content.</p> <p>Future Learning: Forward Links to 7.7</p>

	<p>4.4)</p> <p>Future Learning: Forward Links to: 7.4</p>		
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Year 6

Curriculum Content (Core Knowledge and Vocabulary outlined on the Knowledge Organiser).

Progression in Working Scientifically at a Year 6 Level

Planning

- Use their science experiences and knowledge to explore ideas and raise different kinds of questions.
 - Talk about how scientific ideas have developed over time
- Select and plan the most appropriate type of scientific enquiry and use to answer scientific questions
- Use and develop keys and other information records to identify, classify and describe living things, identifying patterns that may be found in the natural environment.

Enquiring and Testing

- Recognise when and how to set up comparative and fair tests and explain which variables need to be controlled and why
- Recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact.

Observing and recording

- Make own decisions about what observations to make, what measurements to use and how long to make them for. (volume, cm , minutes and seconds , heart rate)
- Choose the most appropriate equipment to make measurements with increasing precision and explain how to use it accurately. Take repeat measurements where appropriate. (funnel, circuits (batteries, wires, buzzers, bulbs, switches), torches, refraction machine, stopwatches)
- Decide how to record data and results of increasing complexity from a choice of familiar approaches: scientific diagrams, classification keys, tables

Evaluating and communicating

- Identify scientific evidence that has been used to support or refute ideas or arguments.
- Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas
- report conclusions, causal relationships and explanations of degree of trust in results
- Use results to make predictions and identify when further observations, comparative and fair tests might be needed.

Core Disciplinary vocabulary (build on competence of year 5 vocabulary)

Variables, independent variable, dependent variable, control variable, evidence, justify, argument (science), causal relationship, accuracy, precision, heart rate, wattage,

St Mark's All-Through Curriculum Map for Science (KS1 – 2)

<p>Year 6</p>	<p><u>Autumn 1: Living Things and Their Habitats (6.1)</u></p> <p>Review and re-visit Year 4 grouping and classification KO (4.3).</p> <p>-Look at the classification system in more detail: 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. Look at how these broad groups can then be sub-divided.</p> <p>-give reasons for classifying plants and animals based on specific characteristics</p> <p>-Find out about the work of Carl Linnaeus, a pioneer of classification.</p> <p>Working Scientifically: Classifying and Grouping:</p> <p>-use classification systems and keys to identify some animals and plants in the immediate environment.</p> <p>Secondary Sources: -Find out about the work of Carl Linnaeus, a pioneer of classification. (separate opinion from fact)</p> <p>Enquiry questions: Is yeast a living thing?</p>	<p><u>Spring 1: Light (6.3)</u></p> <p>Review and revisit light source knowledge from Year 3 (3.1). -recognise that light appears to travel in straight lines</p> <p>-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 Review and re-visit shadow knowledge from Year 3 (3.1).</p> <p>-use the idea that light travels in straight lines to explain why do shadows have the same shape as the objects that cast them</p> <p>Working Scientifically: Comparative and fair testing: -investigating how shadow size can be changed.</p> <p>Enquiry questions: What happens when light travels through different objects? How does the position of the object affect the size of the shadow?</p> <p>Future Learning: Forward Links to 7.8</p>	
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St Mark's All-Through Curriculum Map for Science (KS1 – 2)

Year	<u>Autumn 2: Electricity (6.2)</u>	<u>Spring 2: Animals Including Humans (6.4)</u>	<u>Summer 2: Evolution and Inheritance (6.5)</u>
6	<p>Review and re-visit electricity knowledge from Year 4 (4.4) and DT in Year 5.</p> <ul style="list-style-type: none"> -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 <p>Working Scientifically: Comparative and fair testing: -systematically identifying the effect of changing one component at a time in a circuit.</p> <p>Enquiry questions: If we add more cells/buzzers to our circuit, what happens to the brightness of the bulb/voltage/volume? Future Learning: Forward Links to: 7.4</p>	<p>Review and re-visit Year 3 (3.2) and Year 4 (4.1) knowledge on body parts and internal organs (skeletal, muscular and digestive system). -identify and name the main parts of the human circulatory system, and -describe the functions of the heart, blood vessels and blood</p> <p>Review and re-visit Year 3 nutrition (3.2).</p> <ul style="list-style-type: none"> -recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function -describe the ways in which nutrients and water are transported within animals, including humans <p>Working Scientifically: Survey/Pattern Seeking: -explore the impact of exercise on pulse rate</p> <p>Enquiry questions:</p> <p>What is the function of the human heart? How does exercise impact our heart rate?</p> <p>Future Learning: Forward Links to 7.9</p>	<p>Review and Re-visit Year 3 fossil knowledge (3.4).</p> <ul style="list-style-type: none"> -recognise that living things have changed over time and that fossils (3.4) 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 e.g. cross breeds of dogs - explore the idea that variation in offspring over time can make animals more or less able to survive in particular environments -Explore the work of palaeontologists such as Mary Anning, Charles Darwin and Alfred Wallace. <p>-identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution</p> <p>Working Scientifically: Secondary Sources: -observing and raising questions about animals and how they are adapted to their environment; - comparing and analysing how some living things are adapted to survive in extreme conditions (separate opinion from fact) Survey/Pattern Seeking: -birds beaks (ASE)</p> <p>Enquiry questions: How does the size of a bird's beak affect the ability to gather seeds</p>