



St Mark's C. E Junior School

Progressive Knowledge, Skills & Outcome Journey for Science

Outcomes				
	Year 3	Year 4	Year 5	Year 6
Autumn	<p>Children will study and classify a range of rocks and soils.</p> <p>Children will look at the human body & it's skeleton, investigating how to keep healthy.</p>	<p>Children will learn about circuits and what conducts / insulates.</p> <p>Children will learn about the changing states of solids, liquids and gasses.</p>	<p>Children will learn about resistance and friction and how levers, pulleys and gears work.</p> <p>Children will learn about the different lifecycles of a variety of organisms.</p>	<p>Children will learn that light travels in straight lines and creates a copy of the shape which blocks it.</p> <p>Children will test whether brightness and volume are linked to voltage.</p>
Spring	<p>Children will study what materials are magnetic.</p> <p>Identify and describe the functions of a plant</p>	<p>Children will learn that sound creates pitch and volume and travels via vibration.</p> <p>Children will study the whole digestive system, focusing on the teeth.</p>	<p>Children will learn that materials can combine and that some processes are reversible.</p> <p>Children will learn about night and day through movement of the earth and moon.</p>	<p>Children will learn that living things change over time and adapt to their environment.</p> <p>Children will classify are range of living things including micro organisms, plants and animals.</p>
Summer	<p>Children will recognise that shadows and their size are created by the distance the source is away from the object blocking the light.</p>	<p>Children will construct and identify food chains.</p> <p>Children will simply classify living things and learn how they are adapted to their environment..</p>	<p>Children will describe the changes of humans over time.</p>	<p>Children will study the circulatory system and the impact of external influences on the body.</p> <p>Children will explore the effect of climate change.</p>

Topic Knowledge Progression

	Y3	Y4	Y5	Y6
Rocks and Soils	<p>Rocks & Soils</p> <ul style="list-style-type: none"> - Group based on appearance and simple physical properties - Describe fossil formation - Recognise soils made from rocks and organic matter 			
Sound		<p>Sound</p> <ul style="list-style-type: none"> - Identify how sounds made (vibration) - Sound vibrations travel through medium to ear - Patterns between pitch and object features - Patterns between volume of sound and strength of vibrations - Sound gets fainter as distance increases - 		
Magnets & Force	<p>Forces and Magnets</p> <ul style="list-style-type: none"> - Compare movement on surfaces - Need contact between two objects except magnetic forces - Magnets – attract / repel, predictions - Group materials by attraction to magnets - Identify magnetic materials 		<p>Forces</p> <ul style="list-style-type: none"> - Gravity - Effects of air resistance, water resistance & friction - Mechanisms - levers, pulleys & gears allow smaller forces to have greater effect 	

Electricity		Electricity <ul style="list-style-type: none"> - Construct simple series electrical circuits - Identify basic parts - Recognise switches open / close circuits - Recognise common conductors / insulators 		Electricity <ul style="list-style-type: none"> - Brightness or volume linked to voltage - Compare variations in component function - Used recognised symbols
All living things	Plants <ul style="list-style-type: none"> - Identify & describe functions - Explore plant requirements - Life cycle Water transportation	All living things <ul style="list-style-type: none"> - Group & classify variety of living things in variety of ways. - Changing environment pose dangers to living things 	All living things <ul style="list-style-type: none"> - Differences in lifecycles of mammals, amphibians, insects & birds - Describe life process of reproduction in plants and animals 	All living things <ul style="list-style-type: none"> - Describe how living things are classified into broad groups based on similarities & differences, inc microorganisms, plants and animals - Give reasons for classifying based on specific characteristics
Animals inc humans	Animals & Humans <ul style="list-style-type: none"> - Require correct nutrition. - Cannot make food Skeletons support, protect & movement	Animals & Humans <ul style="list-style-type: none"> - Functions of digestive system - Teeth types & functions - Construct and interpret food chains – producers, predators and prey 	Animals and Humans <ul style="list-style-type: none"> - Describe changes as humans develop to old age 	Animals & Humans <ul style="list-style-type: none"> - Identify main parts circulatory system & describe functions of heart, blood & blood vessels - Impact of diet, exercise, drugs & lifestyle on body function - Nutrients & water transported in animals & humans
States of matter (Y3) & Properties and changes of material (Y5)		States of Matter <ul style="list-style-type: none"> - Group materials as solids, liquids, gases - Change of state – heating & cooling - Water cycle – evaporation & condensation 	Properties and changes of materials <ul style="list-style-type: none"> - Compare and group everyday materials based on properties - Know some materials dissolve to form solution (& it's recovery process) - Separating mixtures - Demonstrate reversible changes Explain irreversible changes	
Light	Light <ul style="list-style-type: none"> - Recognise importance of light for sight - Light is reflected 			Light <ul style="list-style-type: none"> - Light appears to travel in straight lines - Visible object because of

	<ul style="list-style-type: none"> - Shadows formed by blocking light <p>Size of shadows</p>			<ul style="list-style-type: none"> - reflection or omission of light - Shadows have same shape as objects that cast them
Earth, sun & moon			<p>Earth, Sun and Moon</p> <ul style="list-style-type: none"> - Describe movement of Earth & planets relative to Sun - Describe moon movement relative to Earth - Earths rotation for day / night and 'apparent' movement of sun 	
Evolution & inheritance				<p>Evolution and Inheritance</p> <ul style="list-style-type: none"> - Recognise living things changed over time - Produce same but non-identical offspring - Adaptation (evolution) to suit environment

Assessment				
	Year 3	Year 4	Year 5	Year 6
Autumn	<p>How have different rock types helped in creating buildings?</p> <p>Why are different soils important?</p> <p>What would happen if our skeleton doesn't function as it should?</p> <p>Why is it important to think about what we eat and the exercise we do?</p>	<p>Are insulators as important as conductors?</p> <p>Why are switches within our home important?</p> <p>Why is it important to understand the different freezing and melting points of materials?</p> <p>What is the water cycle and its importance to life?</p>	<p>What impact to levers, gears and pulleys have on our lives?</p> <p>Why is friction and resistance important in our daily lives?</p> <p>What are seasons and night and day important for survival?</p>	<p>Why does the shape of an object change as the angle of the sun changes?</p> <p>Why is resistance in an electrical circuit important in our home?</p>
Spring	<p>What is the importance of force and friction in our daily lives?</p> <p>Why does a plant need light, heat and water to survive? Explain. How might it affect us if plants don't survive?</p>	<p>What would happen if sound was all at the same volume?</p> <p>Why is pitch important?</p> <p>Why are healthy teeth important?</p>	<p>Are reversible changes as important as irreversible changes?</p> <p>How does understanding the lifecycle of plants help us survive?</p>	<p>What would happen globally if all birds have the same type of beak?</p> <p>Why is it useful to classify living things based on certain characteristics?</p>
Summer	<p>What is a shadow and why might they be useful?</p>	<p>Why do we need a digestive system?</p> <p>Why are food chains important for our survival?</p> <p>Why does an organism need to adapt to its environment?</p>	<p>Why is it important to understand what happens to humans as they age? Why are some products designed for different times in our lives?</p>	<p>Why is it important to think about what we put in our bodies?</p> <p>What effect will global warming / climate change have on our environment, now and in the future?</p>

Investigative Skills – Working scientifically	Year 3	Year 4	Year 5	Year 6
Questioning and predicting	Children ask questions. Start to make predictions.	Make sensible predictions. Use straight forward scientific evidence to answer questions and support their findings. With support think about further questions based on what they have learnt.	Use test results to make appropriate, linked predictions and ask further questions. Recognise when other (secondary) sources will help answer questions that their investigations cannot.	Make predictions for new values and ask their own questions. Use a range of sources to support own evidence and be able to suggest how scientific ideas have developed over time. Evaluate the reliability of their methods and suggest improvements. Identify scientific evidence that's has been used to support or refute ideas/arguments.
For example...	Rocks and soils What re the different types of rocks? Identify different rock types by features. Use secondary information – BCC clips to help. Predict which rocks might be sedimentary / igneous / metamorphic based on secondary information. Recognising different rock types. Vocabulary required eg powdery, rough, sandy, soft, hard etc elicited and displayed. How could we test rocks to find out what type of rock they might be?	Electricity Predict what type of materials conduct electricity. Use knowledge of the world around them (home/sch) Use understanding of a circuit. Think about how this might affect the safety of people.	Forces Use world around us to come up with examples of objects that use air resistance and why it is important. Question what makes an object eg a parachute, resistant. Predict what an object needs to make it more air resistant. Eg wider surface area, lighter object etc. Using their results can they then make further suggestions. For example larger surface area creates more air resistance, what about the shape of the surface area. (different designs same perimeters etc) would this have an effect on results. Could they use secondary information to help answer new questions?	Electricity Children given the definition of current and the definition of voltage. Can they explain the correlation between the two. Can they then give reasons why this is important for our daily lives. Each group is asked how they could test voltage. Write the word 'wire, battery' on the board. Each group needs to come up with an investigation. Clues – thickness / length /number Children to come up with their own hypothesis based on this. Understand that's thy can only change one thing.
Planning & carrying out - See below for examples of different types of scientific enquiry questions for the different science strands.	To use different types of scientific enquiry to answer questions. To include comparative tests, identifying and classifying, observations over time, pattern seeking and research.	To use different types of scientific enquiry to answer questions. To include comparative tests, identifying and classifying, observations over time, pattern seeking and research.	To use different types of scientific enquiry to answer questions. To include comparative tests, identifying and classifying, observations over time, pattern seeking and research.	To use different types of scientific enquiry to answer questions. To include comparative tests, identifying and classifying, observations over time, pattern seeking and research.
One of each type of enquiry needs to	Set up simple practical enquiries.	Set up fair tests and recognise why	Plan different types of scientific	Select the most appropriate ways to

<p>be covered over the course of the year. More than one might be covered in a scientific investigation)</p> <p>Comparative tests Identifying and classifying Observations over time Pattern seeking Research</p>	<p>Set up simple comparative tests.</p>	<p>it is necessary. Identify differences, similarities and changes related to scientific ideas and processes.</p>	<p>enquiries to answer questions – including recognising and controlling variables where necessary. Suggest sensible improvements to experiments.</p>	<p>answer the scientific question using different types of scientific enquiry. Set up further comparative and fair tests based on previous results.</p>
<p>For example...</p>	<p>Grouping and classification of rocks. Scratch test on variety of rocks. Support concept of fair/comparative test. Each table given set of rocks and implements for test. Support children and encourage to form an experiment based on equipment, scaffold method. Children to understand and are supported to suggest everything else needs to remain as similar as possible apart from the rocks.</p>	<p>Using an aim, set equipment and materials and a reminder of fair test children to devise an investigation. Whole class discussion and explanation on investigation ideas and what would make it a fair test. Discuss differences and decide on best practise to get an accurate result. Gather relevant vocabulary and display. Two different questions: Do all metals conduct electricity? (HA) – one paper clip with plastic coating Do all materials conduct electricity? (MA/LA)</p>	<p>In groups children to decide how they will test the hypothesis that they have come up with. They do not need to be doing same test eg size of surface area, weight of object etc, but they must ensure that they understand that they need to control variables and will show this by filling out the new table. Having carried out the test, can they see any way to improve for accuracy of results. For example not enough height to record the fall accurately, what could they do in the future to improve this. This will need to be recorded. Method could be accurately recorded as a labelled diagram or step by step.</p>	<p>Children to design an investigation based on their chosen hypothesis and decide how to carry out, for eg using a comparative test. Possibly carrying out two identical tests at the same time, if testing brightness of bulb. Repeating test swapping wire to ensure batteries aren't playing a part (although this can be suggested in ways to improve test). Think about, and design a further test they could try to test their theory based on their results. Adding more batteries, do they wires still affect volts passing through etc.</p>
<p>Recording and presenting</p>	<p>Start to make systematic and careful observations. Take accurate measurements using standard units with rulers and newton meters. Gather and record data to help answer questions. Start to record finding using simple scientific language – in a variety of ways inc classifying/grouping, tables, and labelled diagrams.</p>	<p>Make systematic and careful observations. Take accurate measurements using standard units using a range of equipment including thermometers and dataloggers. Record findings using simple scientific language. Start to record finding using simple scientific language – in a variety of ways inc keys, bar charts, tables,</p>	<p>Take accurate and precise measurements using appropriate equipment. Know and explain when to take repeat measurements. Gather, record, classify and present data in a variety of ways inc scientific labelled diagrams, keys, graphs and tables.</p>	<p>Choose the most appropriate method for recording data and results of increasing complexity. Inc scatter and line graphs. Make a series of observations, comparisons and measurements with precision.</p>

		and labelled diagrams		
For example...	<p>Pre-made table for recording of observations.</p> <p>LA/MA supported to create table title HA to create table title independently..</p> <p>Use of scientific language / vocabulary for table and any diagrams used.</p> <p>Visual observations.</p>	<p>HA to design own table. MA pre set table but need to title it.</p> <p>LA – scaffolded.</p> <p>Diagrams to be labelled with correct symbols and names eg cell (not battery)</p>	<p>Using equipment know how to use and record accurately. For eg – Timer/stop watch in this instance.</p> <p>To understand and use repeat measure to ensure a more accurate result.</p> <p>To present in a table (including repeat measurements) using mean/median or mode result. Can display in graph format.</p>	<p>To measure wire lengths accurately. Run tests concurrently, visual (photo) being used in Labelled diagrams.</p> <p>If using different no. of batteries – how many volts being used in each series.</p> <p>If using an ammeter, can a line graph be used to show electrical currents as battery number i/ wire length increased, is there a direct relation to the number of volts used and the current received by the bulb etc</p> <p>Table to show this,</p>
Interpreting and evaluating	<p>Report back on findings verbally. With support, form conclusions from findings.</p> <p>Use simple scientific language to communicate their findings.</p> <p>With support, suggest improvements for investigations.</p>	<p>Classify and present data in a variety of ways to help in answering questions.</p> <p>Report back on findings verbally and through written explanations, in a variety of ways inc presentations & displays.</p> <p>Form sensible conclusions from findings.</p> <p>Use straight forward scientific evidence to answer questions. (inc beginning to understand how secondary sources can help).</p> <p>With support, identify new questions arising from the data, making predictions within or beyond the data they have collected.</p> <p>Use relevant scientific vocabulary to support this.</p>	<p>Use scientific evidence to answer questions and support findings, including beginning to use secondary sources and their knowledge of the world around them.</p> <p>Suggest improvements and beginning to look at anomalies.</p> <p>Identify new questions, arising from the data and look at next steps.</p> <p>Use relevant scientific vocabulary to support this.</p>	<p>Report and present the conclusions, causal relationships, degrees of trust and explanations.</p> <p>Make conclusions consistent with evidence related to scientific understanding, knowing when to use secondary sources.</p> <p>Use results to make predictions and set up further comparative and fair tests.</p> <p>Use relevant scientific vocabulary to support this.</p>
For example...	<p>As a class verbally explain findings which are recorded on the board.</p> <p>Draw and recap on secondary information from pupils.</p> <p>Elicit what it might mean in regards</p>	<p>Write a conclusion based on the Y4 structure.</p> <p>Using results – paper clip with plastic surround didn't conduct, support new questions for</p>	<p>Write a conclusion based on the Y5 structure.</p> <p>Based on individual group hypotheses and secondary sources can they improve and suggest new</p>	<p>Use the Y6 conclusion framework to help formulate a conclusion, reflecting on possible improvements, understanding causal relationships and how much</p>

	<p>to results. Pupils to use the scientific language originally scribed and with support decide on which rock type each rock might be based on discovered features.</p>	<p>experiment. Can they make a prediction on this.</p>	<p>investigations, formulating a new aim. Parachutes / paragliders - round and rectangular. How animals use air resistance. Eg Birds and wingspan, and thermals. Flying squirrels etc</p>	<p>they can trust their results. What they could do or use in the future to improve this. Relate findings to world around them. Why is it important to understand the power of voltage what affect does voltage have on the world around them? When might a higher / lower voltage be appropriate? etc</p>
<p>Knowledge</p>	<p>Use what is learnt about rock types to explain why different types of rocks have different uses. Eg slate for roofs.</p>	<p>With support make suggestions as to why the paper clip which has a plastic coating didn't conduct and why this might be important to the world around us. Understand the importance of electrical conductors and insulators in our daily lives.</p>	<p>To understand that air resistance is a force working against another downward force. This allows objects to be either released or flown into the air and held there. How this understanding helped in the design or parachutes and paragliders (why is one round and one rectangular).</p>	<p>To understand that lower voltage is useful and less dangerous for smaller appliances and appliances which we handle regularly. Higher voltage is needed to power things much larger and which need a larger current to keep it running eg car battery, and a torch.</p>

Scientific Enquiry

Scientific Enquiry					
Plants	Comparative tests	Identify & Classify	Observation over time	Pattern Seeking	Research
Y2	<ul style="list-style-type: none"> Do cress seeds grow quicker inside or outside? 	<ul style="list-style-type: none"> How can we identify the trees that we observed on our tree hunt? 	<ul style="list-style-type: none"> What happens to my bean after I have planted it? 	<ul style="list-style-type: none"> Do bigger seeds grow into bigger plants? 	<ul style="list-style-type: none"> How does a cactus survive in a desert with no water?
Y3	<ul style="list-style-type: none"> How does the length of the carnation stem affect how long it takes for the food colouring to dye the petals? Which conditions help seeds germinate faster? 	<ul style="list-style-type: none"> How many ways can you group our seed collection? 	<ul style="list-style-type: none"> What happens to celery when it is left in a glass of coloured water? How do flowers in a vase change over time? 	<ul style="list-style-type: none"> What colour flowers do pollinating insects prefer? 	<ul style="list-style-type: none"> What are all the different ways that seeds disperse?
Animals including humans	Comparative tests	Identify & Classify	Observation over time	Pattern Seeking	Research
Y3	<ul style="list-style-type: none"> How does the angle that your elbow/knee is bent affect the circumference of your upper arm/thigh? How does the skull circumference of a girl compare with that of a boy? 	<ul style="list-style-type: none"> How do the skeletons of different animals compare? 	<ul style="list-style-type: none"> How does our skeleton change over time? (from birth to death) 	<ul style="list-style-type: none"> Do male humans have larger skulls than female humans? 	<ul style="list-style-type: none"> Why do different types of vitamins keep us healthy and which foods can we find them in?
Y4	<ul style="list-style-type: none"> In our class, are omnivores taller than vegetarians? 	<ul style="list-style-type: none"> What are the names for all the organs involved in the digestive system? How can we organise teeth into groups? 	<ul style="list-style-type: none"> How does an eggshell change when it is left in cola? 	<ul style="list-style-type: none"> Are foods that are high in energy always high in sugar? 	<ul style="list-style-type: none"> How do dentists fix broken teeth?
Y5	<ul style="list-style-type: none"> How does age affect a human's reaction time? Who grows the fastest, girls or boys? 	<ul style="list-style-type: none"> Can you identify all the stages in the human life cycle? 	<ul style="list-style-type: none"> How do different animal embryos change? 	<ul style="list-style-type: none"> Is there a relationship between a mammal's size and its gestation period? 	<ul style="list-style-type: none"> Why do people get grey/white hair when they get older?

<p>Y6</p>	<ul style="list-style-type: none"> • How does the length of time we exercise for affect our heart rate? • Can exercising regularly affect your lung capacity? 	<ul style="list-style-type: none"> • Which organs of the body make up the circulation system, and where are they found? 	<ul style="list-style-type: none"> • How does my heart rate change over the day? • How much exercise do I do in a week? 	<ul style="list-style-type: none"> • Is there a pattern between what we eat for breakfast and how fast we can run? 	<ul style="list-style-type: none"> • How have our ideas about disease and medicine changed over time?
	<ul style="list-style-type: none"> • Which type of exercise has the greatest effect on our heart rate? 	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> •

Topic	Comparative tests	Identify & Classify	Observation over time	Pattern Seeking	Research
<p>Evolution and inheritance Y6</p>	<ul style="list-style-type: none"> • What is the most common eye colour in our class? 	<ul style="list-style-type: none"> • Compare the skeletons of apes, humans, and Neanderthals – how are they similar, and how are they different? • Can you classify these observations into evidence for the idea of evolution, and evidence against? 	<ul style="list-style-type: none"> • How has the skeleton of the horse changed over time? 	<ul style="list-style-type: none"> • Is there a pattern between the size and shape of a bird's beak and the food it will eat? 	<ul style="list-style-type: none"> • What happened when Charles Darwin visited the Galapagos islands? • What ideas did American geneticist Barbara McClintock have about genes that won her a Nobel Prize?
<p>Earth & space Y5</p>	<ul style="list-style-type: none"> • How does the length of daylight hours change in each season? 	<ul style="list-style-type: none"> • How could you organise all the objects in the solar system into groups? 	<ul style="list-style-type: none"> • Can you observe and identify all the phases in the cycle of the Moon? 	<p>Is there a pattern between the size of a planet and the time it takes to travel around the Sun?</p>	<ul style="list-style-type: none"> • What unusual objects did Jocelyn Bell Burnell discover? • How do astronomers know what stars are made of? • How have our ideas about the solar system changed over time?
<p>Sound Y4</p>	<ul style="list-style-type: none"> • How does the volume of a drum change as you move further away from it? • How does the length of a guitar string/tuning fork affect the pitch of the sound? 	<ul style="list-style-type: none"> • Which material is best to use for muffling sound in ear defenders? 	<ul style="list-style-type: none"> • When is our classroom the quietest? 	<ul style="list-style-type: none"> • Is there a link between how loud it is in school and the time of day? If there is a pattern, is it the same in every area of the school? 	<ul style="list-style-type: none"> • Do all animals have the same hearing range?

	<ul style="list-style-type: none"> • Are two ears better than one? 				
Living things & their habitats	Comparative tests	Identify & Classify	Observation over time	Pattern Seeking	Research
Y4	<ul style="list-style-type: none"> • Does the amount of light affect how many woodlice move around? • How does the average temperature of the pond water change in each season?? 	<ul style="list-style-type: none"> • Can we use the classification keys to identify all the animals that we caught pond dipping? 	<ul style="list-style-type: none"> • How does the variety of invertebrates on the school field change over the year? 	<ul style="list-style-type: none"> • How has the use of insecticides affected bee population? • 	<ul style="list-style-type: none"> • Why are people cutting down the rainforests and
Y5	<ul style="list-style-type: none"> • How does the level of salt affect how quickly brine shrimp hatch? 	<ul style="list-style-type: none"> • Compare this collection of animals based on similarities and differences in their lifecycle. 	<ul style="list-style-type: none"> • How do brine shrimp change over their lifetime? • How does a bean change as it germinates? 	<ul style="list-style-type: none"> • Is there are relationship between number of petals and number of stamens? 	<ul style="list-style-type: none"> • What are the differences between the life cycle of an insect and a mammal?

Y6	<ul style="list-style-type: none"> How does the temperature affect how much gas is produced by yeast? Which is the most common invertebrate on our school playing field? 	<ul style="list-style-type: none"> How would you make a classification key for vertebrates/invertebrates or microorganisms? 	<ul style="list-style-type: none"> What happens to a piece of bread if you leave it on the windowsill for two weeks? 	<ul style="list-style-type: none"> Do all flowers have the same number of petals? 	<ul style="list-style-type: none"> What do different types of microorganisms do? Are they always harmful?
Electricity	Comparative tests	Identify & Classify	Observation over time	Pattern Seeking	Research
Y4	<ul style="list-style-type: none"> How does the thickness of a conducting material affect how bright the lamp is? Which metal is the best conductor of electricity? 	<ul style="list-style-type: none"> How would you group these electrical devices based on where the electricity comes from? 	<ul style="list-style-type: none"> How long does a battery light a torch for? 	<ul style="list-style-type: none"> Which room has the most electrical sockets in a house? 	<ul style="list-style-type: none"> How has electricity changed the way we live? How does a light bulb work?
Y6	<ul style="list-style-type: none"> How does the voltage of the batteries in a circuit affect the brightness of the lamp? How does the voltage of the batteries in a circuit affect the volume of the buzzer? Which make of battery lasts the longest? Which type of fruit makes the best fruity battery? 	<ul style="list-style-type: none"> How would you group electrical components and appliances based on what electricity makes them do? 	<ul style="list-style-type: none"> How does brightness of bulb change as the battery runs out? How can we measure how quickly a battery is used up? 	<ul style="list-style-type: none"> Does the temperature of a light bulb go up the longer it is on? 	<ul style="list-style-type: none"> How has our understanding of electricity changed over time?

Seasons / Light	Comparative tests	Identify & Classify	Observation over time	Pattern Seeking	Research
Y3	<ul style="list-style-type: none"> How does the distance between the shadow puppet and the screen affect the size of the shadow? Which pair of sunglasses will be best at protecting our eyes? 	<ul style="list-style-type: none"> How would you organise these light sources into natural and artificial sources? 	<ul style="list-style-type: none"> When is our classroom darkest? Is the Sun the same brightness all day? 	<ul style="list-style-type: none"> Are you more likely to have bad eyesight and to wear glasses if you are older? 	<ul style="list-style-type: none"> How does the Sun make light?
Y6	<ul style="list-style-type: none"> How does the angle that a light ray hits a plane mirror affect the angle at which it reflects off the surface? Which material is most reflective? 	<ul style="list-style-type: none"> Can you identify all the colours of light that make white light when mixed together? What colours do you get if you mix different colours of light together? 	<ul style="list-style-type: none"> Does the temperature of a light bulb go up the longer it is on? How does my shadow change over the day? 	<ul style="list-style-type: none"> Is there a pattern to how bright it is in school over the day? And, if there is a pattern, is it the same in every classroom? 	<ul style="list-style-type: none"> Why do some people need to wear glasses to see clearly? How do our eyes adapt to different conditions?
Forces	Comparative tests	Identify & Classify	Observation over time	Pattern Seeking	Research
Y3 (magnetism)	<ul style="list-style-type: none"> How does the mass of an object affect how much force is needed to make it move? Which magnet is strongest? Which surface is best to stop you slipping? 	<ul style="list-style-type: none"> Which materials are magnetic? 	<ul style="list-style-type: none"> If we magnetise a pin, how long does it stay magnetised for? 	<ul style="list-style-type: none"> Do magnetic materials always conduct electricity? Does the size and shape of a magnet affect how strong it is? 	<ul style="list-style-type: none"> How have our ideas about forces changed over time? How does a compass work

Y5	<ul style="list-style-type: none"> • How does the angle of launch affect how far a paper rocket will go? • How does the surface area of an object affect the time it takes to sink? 	<ul style="list-style-type: none"> • Can you label and name all the forces acting on the objects in each of these situations? 	<ul style="list-style-type: none"> • How long does a pendulum swing for before it stops? 	<ul style="list-style-type: none"> • Do all objects fall through water in the same way? • How does surface area of parachute affect the time it takes to fall? 	<ul style="list-style-type: none"> • How do submarines sink if they are full of air?
Materials	Comparative tests	Identify & Classify	Observation over time	Pattern Seeking	Research
Y3	<ul style="list-style-type: none"> • How does adding different amounts of sand to soil affect how quickly water drains through it? • Which soil absorbs the most water? 	<ul style="list-style-type: none"> • Can you use the identification key to find out the name of each of the rocks in your collection? 	<ul style="list-style-type: none"> • How does tumbling change a rock over time? • What happens when water keeps dripping on a sandcastle? 	<ul style="list-style-type: none"> • Is there a pattern in where we find volcanos on planet Earth? 	<ul style="list-style-type: none"> • Who was Mary Anning and what did she discover?

<p>Y4</p>	<ul style="list-style-type: none"> • How does the mass of a block of ice affect how long it takes to melt? • How does the surface area of water affect how long it takes to evaporate? • Does seawater evaporate faster than fresh water? 	<ul style="list-style-type: none"> • Can you group these materials and objects into solids, liquids, and gases? • How would you sort these objects/materials based on their temperature? 	<ul style="list-style-type: none"> • Which material is best for keeping our hot chocolate warm? • How does the level of water in a glass change when left on the windowsill? 	<ul style="list-style-type: none"> • Is there a pattern in how long it takes different sized ice lollies to melt? • How does evaporation rate change as you add more salt to your water? 	<ul style="list-style-type: none"> • What are hurricanes, and why do they happen?
<p>Y5 (Mixtures & Separation)</p>	<ul style="list-style-type: none"> • How does the temperature of tea affect how long it takes for a sugar cube to dissolve? • Which type of sugar dissolves the fastest? 	<ul style="list-style-type: none"> • Can you group these materials based on whether they are transparent or not? 	<ul style="list-style-type: none"> • How does a container of saltwater change over time? • How does a sugar cube change as it is put in a glass of water? 	<ul style="list-style-type: none"> • Do all stretchy materials stretch in the same way? • How does temperature affect how much solute we can dissolve? 	<ul style="list-style-type: none"> • What are microplastics and why are they harming the planet?
<p>Y5 (Changes)</p>	<ul style="list-style-type: none"> • Which material rusts fastest / slowest? • How can we change the 'jelly-ness' of jelly? 	<ul style="list-style-type: none"> • Can you identify and classify these reactions and changes into reversible, and irreversible? Can you describe their groups similarities and differences? 	<ul style="list-style-type: none"> • How does a nail in saltwater change over time? 	<ul style="list-style-type: none"> • What patterns can you notice in different reactions? • How does the amount of bicarbonate of soda, washing up liquid and vinegar affect the reaction? 	<ul style="list-style-type: none"> • What are smart materials and how can they help us?