

Working Scientifically UKS2						
General	Observing and measuring (and observing over time)	Comparative and fair tests	Identifying and classifying	Looking for naturally occurring patterns and relationships	Recording and reporting findings	Researching using secondary sources
Explore and talk about their own ideas.	Make their own decisions about what observations to make, what measurements to use and for how long to make them, and whether to repeat them.	Select and plan the most appropriate type of scientific enquiry to use to answer scientific questions.	Be able, independently, to use simple databases or keys to identify or classify living things, objects or events.	Identify patterns that might be found in the natural environment.	Decide how to record data from a choice of familiar approaches.	Recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact.
Ask pertinent questions.	Choose the most appropriate equipment to make measurements and explain how to use it accurately.	Recognise when and how to set up comparative and fair tests and explain which variables need to be controlled and why.	Be able to discuss reasons why living things are placed in one group and not another.	Systematically investigate the relationship between phenomena, e.g. light and shadows.	Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas and talk about how scientific ideas have developed over time.	Use secondary sources, e.g. internet links to research objects, events and phenomena that cannot be experienced in the classroom, e.g. planetary movements, animals from around the world.
Explore ideas and raise different kinds of questions about scientific phenomena.	Recognise that some measurements or observations may need to be repeated.	Be able to state clearly which is the change variable and which is the measurement variable in a fair test.	Suggest reasons for similarities and differences.	Look for different causal relationships in their data and identify evidence that refutes or supports their ideas.	Decide on the most appropriate method to present findings graphically, e.g. using a line graph or bar chart for different types of data.	Gather and record data to help in answering questions.
Refine a scientific question so that it can be tested.	Repeat observations or measurements appropriately.	Systematically identify the effect of changing one variable at a time.	Begin to understand that broad groupings, such as micro-organisms, plants and animals can be subdivided.	Analyse functions, relationships and interactions more systematically.	Justify what type of presentation is appropriate to use.	
Understand that some scientific questions cannot be answered by a particular investigation.	Be able to select appropriate ranges or intervals of measurements.	Recognise that some variables may be more significant than others in investigations.	Identify the positive aspects and limitations of some forms of classification.	Find out about how scientific ideas have changed and developed over time as new evidence is discovered, e.g. ideas about the solar system.	Explain findings using data to identify causal relationships.	

Objective



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Objective	Be able to suggest changes to questions following collection/analysis of data.	Explain how repeating measurements impacts on data collection.	Be able to justify their choice of method as being appropriate to answer their investigative question.	Use and develop keys and other information records to identify, classify and describe living things and materials.	Recognise when evidence supports an idea or not.	<b>Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.</b>	
	Understand a range of enquiries can be used together to explore an answer to a question.	Recognise when measurements or data are unreliable and be able to take steps to improve this.	Be able to use their results to identify when further tests and observations might be needed.	Create more complex forms of classification tools, e.g. databases, branching keys.	Be able to identify and offer explanations for anomalous results.	<b>Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.</b>	
	Recognise key aspects of a scientific question.	<b>Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.</b>	Compare their own results with others' and suggest reasons why there may be differences.	Create and use a variety of sources to identify and classify living things, objects and phenomena.	<b>Identifying scientific evidence that has been used to support or refute ideas or arguments.</b>		
			Recognise the limitations of tests.				
			<b>Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.</b>				



Child's name: \_\_\_\_\_

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			Using test results to make predictions to set up further comparative and fair tests.				



Knowledge Year 5					
Objective	Biology		Chemistry	Physics	
	Animals, including humans	Living things and their habitats	Properties and changes of materials	Forces	Earth and space
	Know that humans have a life cycle. Y5 LC L1, L2, L5	Recognise that all living things have a life cycle. Y5 LC L1	Understand what is meant by a material's hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets. Y5 M L1	Understand that a force is needed to make things move. Y5 F L1	Recognise the term 'spherical'. Y5 EAS L1
	Know that humans change in appearance and capabilities as they age. Y5 LC L4	Know that all life cycles have distinct stages. Y5 LC L1, L2	Describe materials and identify materials from their description. Y5 M L1	Know that gravity is an invisible force that pulls falling objects back to Earth. Y5 F L1	Know that the Earth, Sun and Moon are part of the solar system. Y5 EAS L1
	<b>Describe the changes as humans develop to old age.</b> Y5 LC L4	Know that some animals metamorphose during their life cycle. Y5 LC L3	Group materials with similar properties. Y5 M L1, L2	Recognise that objects fall because of a force called gravity. Y5 F L1	<b>Describe the Sun, Earth and Moon as approximately spherical bodies.</b> Y5 EAS L1
		Be able to describe the process of metamorphosis. Y5 LC L3	<b>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.</b> Y5 M L1, L2, L3, L4, L6	<b>Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.</b> Y5 F L1, L3	Know that Earth has one moon. Y5 EAS L1
		Be able to identify life cycle stages in different animals. Y5 LC L2, L3, L5	Describe the observation of the apparent disappearance of a soluble solid when it dissolves in a liquid. Y5 SM L2	Describe how friction acts on moving objects to slow them down. Y5 F L2	<b>Describe the movement of the Moon relative to the Earth.</b> Y5 EAS L5
	<b>Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.</b> Y5 LC L1, L2, L3	Explain what a solution is. Y5 SM L2	Understand how friction can be used to improve how well an object grips to a surface. Y5 F L2	Know that the Sun is a star. Y5 EAS L2	



	Animals, including humans	Living things and their habitats	Properties and changes of materials	Forces	Earth and space
Objective		Be able to describe and sequence parts of plant and animal life cycles. Y5 LC L5	Explain that when a solution is left exposed to the air the liquid will evaporate into the air leaving the dissolved solid behind. Y5 SM L2, L4	Recognise that air resistance is a force. Y5 F L3	Know that the Earth is a planet. Y5 EAS L2
		Understand that sexual reproduction in plants and animals requires fertilisation to occur, i.e. between two parents. Y5 LC L6	<b>Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution.</b> Y5 SM L2, L3, L5, L6	Describe how air resistance reduces the speed at which objects fall. Y5 F L3	Know that the Earth, the other planets and their moons form our solar system. Y5 EAS L2
		Know that some plants can reproduce without other plants. Y5 LC L5	Explain how sieving solids is possible because of the comparative size of the pieces of solid and the holes in the sieve. Y5 SM L1	Explain how air can be used to push objects and make them move. Y5 F L4	Understand that the Sun does not move in space. Y5 EAS L2, L3, L4
		<b>Describe the life process of reproduction in some plants and animals.</b> Y5 LC L5, L6	Explain how filtering separates a solid from a liquid because the solid is too large to pass through the holes in the filter but the liquid can pass through. Y5 SM L5	Recognise that water resistance is a force. Y5 F L5	Know that the planets, including Earth, move around the Sun. Y5 EAS L2
			<b>Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.</b> Y5 SM L1, L4, L5, L6	Describe how water resistance slows down moving objects. Y5 F L5	Understand the term 'orbit' and be able to describe what a planetary orbit is. Y5 EAS L1, L2
			Know that a variety of materials may be suitable for an object based on the properties of the materials. Y5 M L2	Describe how the shape of objects can be used to reduce the effects of water resistance. Y5 F L5	<b>Describe the movement of the Earth, and other planets, relative to the Sun in the solar system.</b> Y5 EAS L2, L6
			Raise questions about the properties of materials related to their suitability. Y5 M L4	<b>Identify the effects of air resistance, water resistance and friction, that act between moving surfaces.</b> Y5 F L2, L3, L4, L5	Know that Earth has an axis. Y5 EAS L3



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Objective			Test properties of a material to establish their suitability or not for a given purpose. Y5 M L5	Recall the terms 'spring', 'lever', 'pulley' and 'gear' ('cog'). Y5 F L6	Understand that Earth spins on its axis. Y5 EAS L3
			<b>Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.</b> Y5 M L2, L3, L4, L5, L6	Describe how the use of levers, pulleys and other simple machines reduces the amount of effort needed to move things. Y5 F L6	Understand that by spinning on its axis, some parts of the Earth are in daylight when other parts are in darkness. Y5 EAS L3, L4
			Recall the terms 'dissolving', 'mixing', 'melting', 'freezing', 'evaporation' and 'condensation' from earlier work. Y5 TOC L1	<b>Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.</b> Y5 F L6	<b>Use the idea of the Earth's rotation to explain day and night and the apparent movement of the Sun across the sky.</b> Y5 EAS L3, L4
			Define reversible change. Y5 TOC L1		
			Understand that dissolving is a reversible change based on observations of a soluble solid dissolving in water and then being recovered by evaporating the water. Y5 TOC L1, L2		
			Explain that mixtures can be separated using a sieve or filter meaning the mixtures are not permanently combined so the process is reversible. Y5 TOC L2		
			<b>Demonstrate that dissolving, mixing and changes of state are reversible changes.</b> Y5 TOC L1, L2, L3, L6		



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Objective			Define irreversible change. Y5 TOC L1		
			Describe observable changes when a substance is burnt, identifying that new substances are formed. Y5 TOC L4		
			Describe observable changes when acid and bicarbonate of soda are mixed and explain that new substances are formed. Y5 TOC L5		
			List some of the new substances formed through burning a familiar substance such as wax or wood and combining vinegar and bicarbonate of soda. Y5 TOC L4, L5		
			<b>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.</b> Y5 TOC L4, L5, L6		

