

Science Curriculum

<p>EYFS Curriculum</p> <p>Physical Development Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices.</p>	<p>The Natural World .Explore the natural world around them, making observations and drawing pictures of animals and plants.</p> <ul style="list-style-type: none"> • 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>KEY STAGE ONE NATIONAL CURRICULUM EXPECTATIONS</p>	
<p>Plant Knowledge Pupils should be taught to:</p> <ul style="list-style-type: none"> - identify and name a variety of common wild and garden plants, including deciduous and evergreen trees - identify and describe the basic structure of a variety of common flowering plants, including trees - observe and describe how seeds and bulbs grow into mature plants - find out and describe how plants need water, light and a suitable temperature to grow and stay healthy <p>Animals, including humans Pupils should be taught to:</p> <ul style="list-style-type: none"> - identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals 	<p>Working Scientifically</p> <ul style="list-style-type: none"> - asking simple questions and recognising that they can be answered in different ways; - observing closely, using simple equipment; - performing simple tests; - identifying and classifying; - using their observations and ideas to suggest answers to questions; - gathering and recording data to help in answering questions.

- identify and name a variety of common animals that are carnivores, herbivores and omnivores
- describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets)
- identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense
- notice that animals, including humans, have offspring which grow into adults
- find out about and describe the basic needs of animals, including humans, for survival (water, food and air)
- describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene

Everyday materials

Pupils should be taught to:

- distinguish between an object and the material from which it is made
- identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock
- describe the simple physical properties of a variety of everyday materials
- compare and group together a variety of everyday materials on the basis of their simple physical properties
- identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses
- find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching

<p>Seasonal changes</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> - observe changes across the 4 seasons - observe and describe weather associated with the seasons and how day length varies 	
<p>LOWER KEY STAGE TWO</p>	
<p>Plants</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> - identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers - explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant - investigate the way in which water is transported within plants - explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal <p>Animals, including humans</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> - identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat - identify that humans and some other animals have skeletons and muscles for support, protection and movement 	<p>Working scientifically</p> <ul style="list-style-type: none"> - asking relevant questions and using different types of scientific enquiries to answer them - setting up simple practical enquiries, comparative and fair tests - making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers - gathering, recording, classifying and presenting data in a variety of ways to help in answering questions - recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables - reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions - using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions - identifying differences, similarities or changes related to simple scientific ideas and processes

- describe the simple functions of the basic parts of the digestive system in humans
- identify the different types of teeth in humans and their simple functions
- construct and interpret a variety of food chains, identifying producers, predators and prey

Rocks

Pupils should be taught to:

- 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

Light

Pupils should be taught to:

- 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

Forces and magnets

- compare how things move on different surfaces
- notice that some forces need contact between 2 objects, but magnetic

- using straightforward scientific evidence to answer questions or to support their findings.

forces can act at a distance

- observe how magnets attract or repel each other and attract some materials and not others
- compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials
- describe magnets as having 2 poles
- predict whether 2 magnets will attract or repel each other, depending on which poles are facing

Living things and their habitats

Pupils should be taught to:

- recognise that living things can be grouped in a variety of ways
- explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment
- recognise that environments can change and that this can sometimes pose dangers to living things

States of matter

Pupils should be taught to:

- compare and group materials together, according to whether they are solids, liquids or gases
- observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius ($^{\circ}\text{C}$)
- identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature

Sound

Pupils should be taught to:

- identify how sounds are made, associating some of them with something vibrating
- recognise that vibrations from sounds travel through a medium to the ear
- find patterns between the pitch of a sound and features of the object that produced it
- find patterns between the volume of a sound and the strength of the vibrations that produced it
- recognise that sounds get fainter as the distance from the sound source increases

Electricity

Pupils should be taught to:

- identify common appliances that run on electricity
- construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers
- identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery
- recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit
- recognise some common conductors and insulators, and associate metals with being good conductors

UPPER KEY STAGE TWO

Living things and their habitats

Pupils should be taught to:

Working Scientifically

- describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird
- describe the life process of reproduction in some plants and animals
- describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals
- give reasons for classifying plants and animals based on specific characteristics

Animals, including humans

Pupils should be taught to:

- describe the changes as humans develop to old age
- identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood
- 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

Properties and changes of materials

Pupils should be taught to:

- compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets
- know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution
- use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating

- planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
- recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
- using test results to make predictions to set up further comparative and fair tests
- reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations
- identifying scientific evidence that has been used to support or refute ideas or arguments

- give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic
- demonstrate that dissolving, mixing and changes of state are reversible changes
- explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda

Earth and space

Pupils should be taught to:

- describe the movement of the Earth and other planets relative to the sun in the solar system
- describe the movement of the moon relative to the Earth
- describe the sun, Earth and moon as approximately spherical bodies
- use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky

Forces

Pupils should be taught to:

- explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object
- identify the effects of air resistance, water resistance and friction, that act between moving surfaces
- recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect

Evolution and inheritance

Pupils should be taught to:

- recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago
- recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents
- identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution

Light

Pupils should be taught to:

- recognise that light appears to travel in straight lines
- use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye
- explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes
- use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them

Intent

It is our intention at St Mary and Joseph's to instil in all young people a lifelong curiosity and interest in the sciences. We intend for children to have the opportunity, wherever possible, to learn through varied systematic investigations with quality resources, leading to them being equipped to ask and answer scientific questions about the world around them. As children progress through the year groups, they build on their skills in working scientifically, as well as on their scientific knowledge, as they develop greater independence in planning and carrying out fair and comparative tests to answer a range of scientific questions. At St Mary and St Joseph's we use a knowledge organiser with each unit that can be used to help reinforce the key knowledge as set out in the science national curriculum. The knowledge organisers help children to consolidate and retain the science knowledge they have learnt and also reinforce key scientific vocabulary from each unit. We ensure that children have a varied, progressive and well-mapped-out science curriculum that provides the opportunity for progression across the full breadth of the science national curriculum for KS1 and KS2. Most units are taught thematically to create wider connections with other subjects and the local context. We intend that children understand the uses and implications of science, and linked STEM careers, now and in the future.

Implementation

A love of science is nurtured at our school and children are encouraged to ask questions. The acquisition of key scientific knowledge and conceptual understanding is an integral part of every science lesson. Linked knowledge organisers enable children to learn and retain the important, useful and powerful vocabulary and knowledge contained within each unit. The progression of skills for working scientifically are developed through the year groups and scientific enquiry skills are of key importance within lessons. The progression of these skills is set out in the Science Progression Map. Each lesson has a clear focus. Scientific knowledge and enquiry skills are developed with increasing depth and challenge as children move through the year groups. They complete investigations and hands-on activities while gaining the scientific knowledge for each unit. Interwoven through each lesson are key questions to assess the children's levels of understanding and to review concepts where necessary. The sequence of lessons helps to embed scientific knowledge and skills, with each lesson building on previous learning. Activities are effectively scaffolded so that all children have an appropriate level of support and challenge. At St Mary and St Joseph's we ensure teachers are equipped with secure scientific subject knowledge, enabling them to deliver high-quality teaching and learning opportunities while being aware of possible scientific misconceptions.

Impact

At St Mary and St Joseph's, progress is measured through a child's ability to know more, remember more and explain more. The use of questioning ensures opportunities are built into the lesson for ongoing assessment. Attainment and progress can be measured across the school using end of unit assessment questions and activities. The learning environment across the school is consistent with science technical vocabulary displayed, spoken and used by all learners. The impact of our science curriculum and teaching will be children who feel confident in their science knowledge and enquiry skills and are excited about science, show that they are actively curious to learn more and will see the relevance of what they learn in science lessons to real-life situations and also the importance of science in the real world.

Knowledge & Skills Progression

Subject: Science	Subject Leader: Anita Henderson
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	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Plants	<p>Make observations of plants, explain why some things occur, talk about changes (The World)</p> <p>-Spring walk around the school grounds looking for signs of new life</p> <p>Photograph what we see</p> <p>-Recognise and name the parts of a plant</p> <p>-Grow cress, a bean plant, a sunflower</p> <p>-Learn about the life cycle of a sunflower</p> <p>-Learn about the life cycle of a butterfly</p> <p>Roots, Shoots & Welly Boots (summer 1)</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.</p> <p>Enchanted Woodland (Summer 2)</p>	<p>Observe and describe how seeds and bulbs grow into mature plants.</p> <p>Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.</p> <p>Scented Garden (Summer 1)</p>	<p>Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers.</p> <p>Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant.</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. Flow (Spring 2)</p>			
Animals, including humans	<p>Make observations and talk about changes (The World)</p>	<p>Identify and name a variety of common animals including fish,</p>	<p>Notice that animals, including humans, have offspring which grow into adults.</p>	<p>Identify that animals, including humans, need the right types and amount of nutrition,</p>	<p>Describe the simple functions of the basic parts of the digestive system in humans.</p>	<p>Describe the changes as humans develop to old age.</p>	<p>Identify and name the main parts of the human circulatory</p>

	<p>Look at how we have grown and changed since we were born. Find out about and name different parts of the body.</p> <p><i>Marvelous Me (Autumn 1)</i></p>	<p>amphibians, reptiles, birds and mammals. Identify and name a variety of common animals that are carnivores, herbivores and omnivores. Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets).</p> <p><i>Dinosaur Planet (Autumn 2)</i></p> <p>Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. <i>Superheroes (Autumn 1)</i></p>	<p>Find out about and describe the basic needs of animals, including humans, for survival (water, food and air). Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.</p> <p><i>Wriggle and Crawl (Summer 2)</i></p>	<p>and that they cannot make their own food; they get nutrition from what they eat.</p> <p><i>Human needs covered in Rattle those Bones (Autumn 2), animals covered in Predator (Spring 2)</i></p> <p>Identify that humans and some other animals have skeletons and muscles for support, protection and movement.</p> <p><i>Rattle those Bones (Autumn 2) and Predator (Spring 2).</i></p>	<p>Identify the different types of teeth in humans and their simple functions.</p> <p><i>Bottoms, Burps and Bile (Autumn 2)</i></p> <p>Construct and interpret a variety of food chains, identifying producers, predators and prey.</p> <p><i>Blue Abyss (Summer 2)</i></p>	<p><i>Sort myths from fact. Meet someone older to hear how they feel about ageing.</i></p> <p><i>Allotment (Spring 2)</i></p>	<p>system, and describe the functions of the heart, blood vessels and blood.</p> <p>Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function.</p> <p>Describe the ways in which nutrients and water are transported within animals, including humans.</p> <p><i>Bloodheart (Autumn 2)</i></p>
Everyday materials		<p>Distinguish between an object and the material from which it is made. Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock.</p> <p><i>Bright Lights, Big City (Spring 1)</i></p> <p>Describe the simple physical properties of a variety of everyday materials.</p>				<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.</p> <p>Know that some materials will dissolve in liquid to form a solution, and describe how</p>	

		<p>Compare and group together a variety of everyday materials on the basis of their simple physical properties. Bright Lights, Big City (Spring 1)</p>				<p>to recover a substance from a solution. Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. Demonstrate that dissolving, mixing and changes of state are reversible changes. Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda. <i>Test materials for their suitability for purpose (lunchbox/drinks flask).</i> <i>Pose questions to test further in</i></p>	
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						<i>independently directed investigations.</i> <i>Properties and changes of materials (Autumn 1 and Autumn 2)</i>	
Seasonal Changes		Observe changes across the four seasons. Observe and describe weather associated with the seasons and how day length varies. <i>Splendid Skies (Spring 2)</i>					
Living things and their habitats			Explore and compare the differences between things that are living, dead, and things that have never been alive. Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other. Identify and name a variety of plants and animals in their habitats, including microhabitats. Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food. <i>Beachcombers (Spring 2) and Wriggle and Crawl (Summer 2)</i>		Recognise that living things can be grouped in a variety of ways. Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. Recognise that environments can change and that this can sometimes pose dangers to living things. <i>Blue Abyss (Summer 2)</i>	Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. Describe the life process of reproduction in some plants and animals. <i>Observe the life cycle of butterflies and other animals if possible.</i> <i>Research the life cycles of different species - drawing diagrams to represent the stages.</i> <i>Allotment (Spring 2)</i>	Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals. <i>Give reasons for classifying plants and animals based on specific characteristics.</i> <i>Frozen Kingdoms (Spring 1)</i>

Rocks				<p>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.</p> <p>Emperors and Empires (Summer 1)</p>			
Light				<p>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> <p>Tribal Tales (Autumn 1)</p>			<p>Recognise that light appears to travel in straight lines. Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye. Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes. Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.</p> <p>Discrete Science Unit (Autumn 1)</p>

Forces and magnets	<p>Know about similarities and differences in relation to materials (The World)</p> <p>-Floating & Sinking <i>Ocean Commotion (Summer 2)</i></p>			<p>Compare how things move on different surfaces. Notice that some forces need contact between two objects, but magnetic forces can act at a distance. Observe how magnets attract or repel each other and attract some materials and not others. Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials. Describe magnets as having two poles. Predict whether two magnets will attract or repel each other, depending on which poles are facing. <i>Mighty Metals (Summer 2)</i></p>		<p>Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. Identify the effects of air resistance, water resistance and friction, that act between moving surfaces. Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. <i>Investigate the forces in action on theme park rides and design their own. Make a working model and test it out. <i>Scream Machine (Summer 1) continuing into Forces (Summer 2)</i></i></p>	
States of matter	<p>Make observations, explain why some things occur and talk about changes (The World)</p> <p>Cooking activities: Toast Fruit Kebabs Pizza <i>Food, Glorious Food (Autumn 2)</i> Cooking activities: Porridge</p>				<p>Compare and group materials together, according to whether they are solids, liquids or gases. Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C)</p>		

	Bread Gingerbread Men Noodles and Rice Pancakes <i>Once Upon a Time (Spring 1)</i> -Make chocolate Easter nests: observe changes to chocolate when melted and then when cooled again <i>Once Upon a Time (spring 2)</i>				<i>States of Matter (Autumn 1)</i> Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. <i>Misty Mountain Sierra (Spring 2)</i>		
Sound					Identify how sounds are made, associating some of them with something vibrating. Recognise that vibrations from sounds travel through a medium to the ear. Find patterns between the pitch of a sound and features of the object that produced it. Find patterns between the volume of a sound and the strength of the vibrations that produced it. Recognise that sounds get fainter as the distance from the sound source increases. <i>Playlist (Summer 1)</i>		
Electricity					Identify common appliances that run on electricity.		Associate the brightness of a lamp or the volume of a buzzer

					<p>Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers.</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>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>Road Trip USA (Spring 1)</p>		<p>with the number and voltage of cells used in the circuit.</p> <p>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.</p> <p>Use recognised symbols when representing a simple circuit in a diagram.</p> <p>Discrete Science Unit (Summer 2)</p>
Earth and Space						<p>Describe the movement of the Earth, and other planets, relative to the Sun in the solar system.</p> <p>Describe the movement of the Moon relative to the Earth</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. <i>Model the movements of planets and the moon in groups with .</i> <i>Create 3D models of the solar system.</i> <i>Study satellite and telescope pictures and learn their uses.</i> <i>Pose questions about the planets and space exploration and research answers.</i> <i>Watch videos of different space careers.</i> Stargazers (Spring 1)</p>	
Evolution and inheritance							<p>Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.</p>

Working Scientifically						
Answering and answering questions	Use everyday language/begin to use simple scientific words to ask or answer a scientific question.	Suggest ideas, ask simple questions and know that they can be answered/investigated in different ways including simple secondary sources such as books/video clips.	Use ideas to pose questions, independently about the world around them.	Suggest relevant questions and know that they could be answered in a variety of ways including using secondary sources such as ICT. Answer questions using straight forward scientific evidence.	Raise different types of scientific questions and hypotheses.	Pose/select the most appropriate line of enquiry to investigate scientific questions.
Investigating	Follow instructions to complete a simple test individually or in a group.	Do things in the correct order when performing a simple test and begin to recognise when something is unfair.	Discuss enquiry methods and describe a fair test.	Make decisions about different enquiries including recognising when a fair test is necessary and begin to identify variables.	Plan a range of science enquiries including comparative and fair tests.	Select and plan the most suitable line of enquiry, explaining which variables need to be controlled and why in a variety of comparative and fair tests.
Observing	Observe objects materials and living things and describe what they see.	Observe something closely and describe changes over time.	Make decisions about what to observe during an investigate.	Make systematic and careful observations.	Plan and carry out comparative and fair tests making systematic and careful observations.	Make their own decisions about which observations to make using test results and observations to make predictions or set up further comparative or fair tests.
Equipment and measuring	Use simple, non- standard measurements in a practical task.	Use simple equipment such as hand lenses or egg timer to take measurements, make observations and carry out simple tests.	Take accurate measurements using standard units.	Take accurate measurements using standard units and a range of equipment, including thermometers and dataloggers.	Take measurements using a range of scientific equipment with increasing accuracy and precision.	Choose the most appropriate equipment in order to take measurements, explaining how to use it accurately. Decide how long to take measurements for, checking results with additional readings.
Identifying and classifying	Sort and group objects, materials and living things with help, according to simple observational features.	Decide, with help, how to group materials, living things and objects, noticing changes over time and beginning to see patterns.	Talk about criteria for grouping, sorting and categorising, beginning to see patterns and relationships.	Identify similarities/differences/ changes when talking about scientific processes. Use and begin to create simple keys.	Use and develop keys to identify classify and describe living things and materials.	Identify and explain patterns seen in the natural environment.

Recording and reporting on findings	Talk about their findings and explain what they have found out.	Gather data, record and talk about their findings in a range of ways using simple scientific vocabulary.	Record their findings using scientific language and present in note form, writing frame, diagrams, tables and charts.	Choose appropriate ways to record and present information, findings and conclusions for different audiences e.g. displays, oral or written explanations.	Record data and results of increasing complexity using scientific diagrams, labels, classification keys, tables, bar and line graphs and model.	Choose the most effective approach to record and report results linking to mathematical knowledge.
Analysing data	Use every day or simple scientific language to ask and or answer a question on given data.	Identify simple patterns and/or relationships using simple comparative language.	Gather record and use data in a variety of ways to answer a simple question.	Identify, with help, changes, patterns, similarities and differences in data to help form conclusions. Use scientific evidence to support their findings.	Use relevant scientific language and illustrations to discuss communicate and justify their scientific ideas.	Identify and explain causal relationships in data and identify evidence that supports or refutes their findings, selecting fact from opinion.
Drawing conclusions	Explain with help what they think they have found out.	Use simple scientific language to explain what they have found out.	Draw, with help, a simple conclusion based on evidence from an enquiry or observation.	Use recorded data to make predictions, pose new questions and suggest improvements for further enquiries.	Use simple mode of communication to justify their conclusions on a hypothesis. Begin to recognise how scientific ideas change over time.	Identify validity of conclusion and required improvement to methodology. Discuss how scientific ideas develop over time.