



Science

PROGRESSION DOCUMENT

Subject Lead: Mrs Bedworth

EYFS

End of Reception Expectations

- Talk about the lives of the people around them and their roles in society.
- Describe their immediate environment using knowledge from observation, discussion, stories, non-fiction texts and maps.
- Explore the natural world around them, making observations and drawing pictures of animals and plants.
- 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.

Nursery

- Explores natural materials with a hands on approach
- Begins to explore different materials
- Explore how things work
- Explores and groups different natural materials (shape, size, length)
- Plants seeds and understands how to care for them
- Talks about materials and changes that can be made e.g. floating/melting/stretching
- Begin to discuss key features of a life cycle
- Can talk about caring for living things

Reception

- Describe what they see, hear and feel outside
- Can discuss differences in environments
- Explore the natural world around them
- Investigates changes in states of matter
- Name and describe different occupations

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Animals Including Humans	<p>Children will learn to:</p> <ul style="list-style-type: none"> • identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals; • identify and name a variety of common animals that are carnivores, herbivores and omnivores; • describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets); • identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. 	<p>Children will learn to:</p> <ul style="list-style-type: none"> • 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. 	<p>Children will learn 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>Children will learn to:</p> <ul style="list-style-type: none"> • 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. 	<p>Children will learn to:</p> <ul style="list-style-type: none"> • describe the changes as humans develop to old age. 	<p>Children will learn to:</p> <ul style="list-style-type: none"> • 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.
Plants	<p>Children will learn 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. 	<p>Children will learn to:</p> <ul style="list-style-type: none"> • 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>Children will learn 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. 			

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Living Things and Their Habitats		<p>Children will learn to:</p> <ul style="list-style-type: none"> • 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. 		<p>Children will learn to:</p> <ul style="list-style-type: none"> • 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. 	<p>Children will learn to:</p> <ul style="list-style-type: none"> • 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. 	<p>Children will learn to:</p> <ul style="list-style-type: none"> • 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.
Evolution and Inheritance						<p>Children will learn to:</p> <ul style="list-style-type: none"> • 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.

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Seasonal Changes	<p>Children will learn 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. 					
Forces			<p>Forces and Magnets</p> <p>Children will learn to:</p> <ul style="list-style-type: none"> • compare how things move on different surfaces; • notice that some forces need contact between 2 objects, but magnetic forces can act at a distance; • observe how magnets attract or repel each other and attract some materials and not others; • compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials; • describe magnets as having 2 poles; • predict whether 2 magnets will attract or repel each other, depending on which poles are facing. 		<p>Forces</p> <p>Children will learn to:</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; • 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. 	

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Light			<p>Children will learn to:</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>Children will learn to:</p> <ul style="list-style-type: none"> • 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.
Sound				<p>Children will learn to:</p> <ul style="list-style-type: none"> • 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. 		

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Earth and Space					<p>Children will learn to:</p> <ul style="list-style-type: none"> • 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. 	
Electricity				<p>Children will learn to:</p> <ul style="list-style-type: none"> • 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. 		<p>Children will learn to:</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.

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Materials	<p>Everyday Materials</p> <p>Children will learn to:</p> <ul style="list-style-type: none"> 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. 	<p>Uses of Everyday Materials</p> <p>Children will learn to:</p> <ul style="list-style-type: none"> 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>Rocks</p> <p>Children will learn to:</p> <ul style="list-style-type: none"> 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>States of Matter</p> <p>Children will learn to:</p> <ul style="list-style-type: none"> compare and group materials together, according to whether they are solids, liquids or gases; observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C); identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. 	<p>Properties and Changes of Materials</p> <p>Children will learn to:</p> <ul style="list-style-type: none"> compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets; know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution; use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating; give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic; demonstrate that dissolving, mixing and changes of state are reversible changes; explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda. 	

Also see examples of everyday scientists - <https://pstt.org.uk/resources/curriculum-materials/ASJLM>

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Scientists and Inventors	<p>Children will learn to:</p> <ul style="list-style-type: none"> <u>Plants</u> <p>Investigation – observation skills using magnifying glasses</p> <p>Scientists – Chef.</p> <p><u>Everyday materials</u></p> <p>Investigation - Raise and answer questions about everyday materials.</p> <p>What is the best material for an umbrella?</p> <p>Scientist – Us.</p> <p><u>Seasonal changes</u></p> <p>Investigation – make a simple rain gauge.</p> <p>Scientist – weather forecaster</p> <p><u>Animals including humans</u></p> <p>Investigation – local environmental study. (learn how to treat and put living things back)</p> <p>Group animals based on a set criteria (e.g. what they eat)</p> <p>Scientist – Vets, Florence Nightingale</p>	<p>Children will learn to:</p> <ul style="list-style-type: none"> <u>Plants</u> <p>Investigation - Growing a bean from a seeds.</p> <p>Growing a hyacinth from a bulb</p> <p>Light and water comparative test.</p> <p>Scientist - Alan Titchmarsh?</p> <p><u>Uses of everyday materials</u></p> <p>Identify and classify the uses of different materials and record observations.</p> <p>Scientist - Dunlop.</p> <p><u>Living things in their habitat</u></p> <p>Investigation – First hand observation of humans through time (length of wrist to elbow through the school)</p> <p>Sort and classify living things. (Construct simple food chains)</p> <p>Scientist – Us – How can we look after our school environment</p> <p><u>Animals including humans</u></p> <p>Investigation – First hand observations over time. (measurement of wrist to elbow across the school)</p> <p>Scientist – Doctors, nurses, Mary Seacole</p>	<p>Children will learn to:</p> <ul style="list-style-type: none"> <u>Plants</u> <p>Investigation - Effect of different factors on plant growth</p> <p>Water transportation using white carnations</p> <p>Scientist - David Attenborough?</p> <p><u>Materials – Rocks</u></p> <p>Investigation into the hardness of rocks.</p> <p>Scientist – Mary Anning (fossils)</p> <p><u>Light</u></p> <p>Investigation – patterns with shadows when the light source moves or changes distance. Scientist – Opticians.</p> <p><u>Forces and magnets</u></p> <p>Investigation – Developing a fair test to explore the force of magnets through different surfaces and recording the results.</p> <p>Devise a way to use magnets in everyday life.</p> <p>Scientist - Magnes is a mythological figure - made 1st magnet =William Gilbert</p> <p><u>Animals including humans</u></p> <p>Investigation – make own animal poo for children to dissect and explore the diet.</p> <p>Weigh out the sugar found in popular foods.</p> <p>Scientist – Marie Curie</p>	<p>Children will learn to:</p> <ul style="list-style-type: none"> <u>Materials - States of matter</u> <p>Investigation – Slime.</p> <p>Melting investigation, use of thermometers. Observations over a period of time.</p> <p>Scientist – Lonnie G Johnson (invented the water soaker)</p> <p><u>Electricity</u></p> <p>Investigation – investigate conductors and insulators when creating their own switch</p> <p>Scientist – Thomas Edison</p> <p><u>Sound</u></p> <p>Investigation – design the best ear muffs to insulate sound.</p> <p>Scientist – Alexander Graham Bell</p> <p><u>Living things in their habitat</u></p> <p>Investigation – use and make simple guides and keys to explore and identify local plants and animals</p> <p>Scientist – Conservationist (UK/Global) - Us.</p> <p><u>Animals including humans</u></p> <p>Investigation – Using old tights and bread, recreate the digestive system.</p> <p>Scientist - Dentists</p>	<p>Children will learn to:</p> <ul style="list-style-type: none"> <u>Materials – Properties and changes in materials</u> <p>Investigation – evaporation and condensation (reversible change)</p> <p>Bicarbonate and soda – chemical reactions (irreversible change)</p> <p>Scientist - Spencer Silver, who invented the glue for sticky notes or Ruth Benerito, who invented wrinkle-free cotton.</p> <p><u>Earth and space</u></p> <p>Investigation – construct a simple sun dial.</p> <p>Scientist - Tim Peake Ptolemy</p> <p><u>Forces</u></p> <p>Investigation – design and test parachutes.</p> <p>Scientist – Isaac Newton, Galileo Galilei</p> <p><u>Living things in their habitat</u></p> <p>Investigation – asexual reproduction – grow a new plant.</p> <p>Scientist - Jane Goodall</p> <p><u>Animals including humans</u></p> <p>Research the gestation period of animals and compare them with humans. Record data of length and mass of an infant as it grows.</p> <p>Scientist – Midwife/ health visitor</p>	<p>Children will learn to:</p> <ul style="list-style-type: none"> <u>Electricity</u> <p>Investigation – The effect of multiple batteries/buzzers/bulbs on each other.</p> <p>Scientist – Tesla, Volta, Faraday.</p> <p><u>Light</u></p> <p>Investigation – make a periscope.</p> <p>Investigate prisms and refraction of light</p> <p>Scientist - Sir Howard Grubb</p> <p><u>Evolution and inheritance</u></p> <p>Investigation – Darwin's Finches (Beaks)</p> <p>Scientist – Charles Darwin</p> <p><u>Living things in their habitat</u></p> <p>Nature count – How many different species in one area.</p> <p>Scientist - Linnaeus</p> <p><u>Animals including humans</u></p> <p>Jelly snakes and skittles – Osmosis and diffusion.</p> <p>Pulse rate</p> <p>Scientist - explore the work of scientists and scientific researchers about the relationship between diet, exercise, drugs, lifestyle and health.</p> <p>William Harvey (discovered the circulatory system)</p> <p>Paul Winchell (patented the artificial heart)</p>

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	KS1	LKS2	UKS2
Asking Questions and Carrying Out Fair and Comparative Tests	<p>KS1 Science National Curriculum Asking simple questions and recognising that they can be answered in different ways.</p> <p><i>Performing simple tests. Children can:</i></p> <ul style="list-style-type: none"> ▪ explore the world around them, leading them to ask some simple scientific questions about how and why things happen; ▪ begin to recognise ways in which they might answer scientific questions; ▪ ask people questions and use simple secondary sources to find answers; ▪ carry out simple practical tests, using simple equipment; ▪ experience different types of scientific enquiries, including practical activities; ▪ talk about the aim of scientific tests they are working on. 	<p>Lower KS2 Science National Curriculum Asking relevant questions and using different types of scientific enquiries to answer them.</p> <p><i>Setting up simple practical enquiries, comparative and fair tests.</i></p> <p><i>Children can:</i></p> <ul style="list-style-type: none"> ▪ start to raise their own relevant questions about the world around them in response to a range of scientific experiences; ▪ start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions; ▪ recognise when a fair test is necessary; ▪ help decide how to set up a fair test, making decisions about what observations to make, how long to make them for and the type of simple equipment that might be used; ▪ set up and carry out simple comparative and fair tests. 	<p>Upper KS2 Science National Curriculum Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.</p> <p>Using test results to make predictions to set up further comparative and fair tests.</p> <p><i>Children can:</i></p> <ul style="list-style-type: none"> ▪ with growing independence, raise their own relevant questions about the world around them in response to a range of scientific experiences; ▪ with increasing independence, make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions; ▪ explore and talk about their ideas, raising different kinds of scientific questions; ▪ ask their own questions about scientific phenomena; ▪ select and plan the most appropriate type of scientific enquiry to use to answer scientific questions; ▪ make their own decisions about what observations to make, what measurements to use and how long to make them for, and whether to repeat them; ▪ plan, set up and carry out comparative and fair tests to answer questions, including recognising and controlling variables where necessary; ▪ use their test results to identify when further tests and observations may be needed; ▪ use test results to make predictions for further tests.

<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Observing and Measuring Changes</p>	<p>KS1 Science National Curriculum Observing closely, using simple equipment.</p> <p><i>Children can:</i></p> <ul style="list-style-type: none"> ▪ observe the natural and humanly constructed world around them; ▪ observe changes over time; ▪ use simple measurements and equipment; ▪ make careful observations, sometimes using equipment to help them observe carefully. 	<p>Lower KS2 Science National Curriculum Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.</p> <p><i>Children can:</i></p> <ul style="list-style-type: none"> ▪ make systematic and careful observations; ▪ observe changes over time; ▪ use a range of equipment, including thermometers and data loggers; ▪ ask their own questions about what they observe; ▪ where appropriate, take accurate measurements using standard units using a range of equipment. 	<p>Upper KS2 Science National Curriculum Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.</p> <p><i>Children can:</i></p> <ul style="list-style-type: none"> ▪ choose the most appropriate equipment to make measurements and explain how to use it accurately; ▪ take measurements using a range of scientific equipment with increasing accuracy and precision; ▪ make careful and focused observations; ▪ know the importance of taking repeat readings and take repeat readings where appropriate.
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Identifying, Classifying, Recording and Presenting Data</p>	<p>KS1 Science National Curriculum Identifying and classifying. Gathering and recording data to help in answering questions.</p> <p><i>Children can:</i></p> <ul style="list-style-type: none"> ▪ use simple features to compare objects, materials and living things; ▪ decide how to sort and classify objects into simple groups with some help; ▪ record and communicate findings in a range of ways with support; ▪ sort, group, gather and record data in a variety of ways to help in answering questions such as in simple sorting diagrams, pictograms, tally charts, block diagrams and simple tables. 	<p>Lower KS2 Science National Curriculum 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.</p> <p><i>Children can:</i></p> <ul style="list-style-type: none"> ▪ talk about criteria for grouping, sorting and classifying; ▪ group and classify things; ▪ collect data from their own observations and measurements; ▪ present data in a variety of ways to help in answering questions; ▪ use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge; ▪ record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables. 	<p>Upper KS2 Science National Curriculum Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.</p> <p><i>Children can:</i></p> <ul style="list-style-type: none"> ▪ independently group, classify and describe living things and materials; ▪ use and develop keys and other information records to identify, classify and describe living things and materials; ▪ decide how to record data from a choice of familiar approaches; ▪ record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar graphs and line graphs.

<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Drawing Conclusions, Noticing Patterns and Presenting Findings</p>	<p>KS1 Science National Curriculum Using their observations and ideas to suggest answers to questions.</p> <p>Children can:</p> <ul style="list-style-type: none"> ▪ notice links between cause and effect with support; ▪ begin to notice patterns and relationships with support; ▪ begin to draw simple conclusions; ▪ identify and discuss differences between their results; ▪ use simple and scientific language; ▪ read and spell scientific vocabulary at a level consistent with their increasing word reading and spelling knowledge at key stage 1; ▪ talk about their findings to a variety of audiences in a variety of ways. 	<p>Lower KS2 Science National Curriculum Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.</p> <p>Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.</p> <p>Children can:</p> <ul style="list-style-type: none"> ▪ draw simple conclusions from their results; ▪ make predictions; ▪ suggest improvements to investigations; ▪ raise further questions which could be investigated; ▪ first talk about, and then go on to write about, what they have found out; ▪ report and present their results and conclusions to others in written and oral forms with increasing confidence. 	<p>Upper KS2 Science National Curriculum 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.</p> <p>Children can:</p> <ul style="list-style-type: none"> ▪ notice patterns; ▪ draw conclusions based in their data and observations; ▪ use their scientific knowledge and understanding to explain their findings; ▪ read, spell and pronounce scientific vocabulary correctly; ▪ identify patterns that might be found in the natural environment; ▪ look for different causal relationships in their data; ▪ discuss the degree of trust they can have in a set of results; ▪ independently report and present their conclusions to others in oral and written forms.
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Using Scientific Evidence and Secondary Sources of Information</p>		<p>Lower KS2 Science National Curriculum Identifying differences, similarities or changes related to simple scientific ideas and processes.</p> <p>Using straightforward scientific evidence to answer questions or to support their findings.</p> <p>Children can:</p> <ul style="list-style-type: none"> ▪ make links between their own science results and other scientific evidence; ▪ use straightforward scientific evidence to answer questions or support their findings; ▪ identify similarities, differences, patterns and changes relating to simple scientific ideas and processes; ▪ recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations. 	<p>Upper KS2 Science National Curriculum Identifying scientific evidence that has been used to support or refute ideas or arguments.</p> <p>Children can:</p> <ul style="list-style-type: none"> ▪ use primary and secondary sources evidence to justify ideas; ▪ identify evidence that refutes or supports their ideas; ▪ recognise where secondary sources will be most useful to research ideas and begin to separate opinion from fact; ▪ use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas; ▪ talk about how scientific ideas have developed over time.