

Science

- National Curriculum
- Coverage and Beacons



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Resilient, Persistent, Self-Motivated, Creative

Risk Takers, Good Citizens, Entrepreneurial

EFYS	KS1 National Curriculum	KS2 National Curriculum	
The World Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants, and explain why some things occur and talk about changes	The principal focus of science teaching in key stage 1 is to enable pupils to experience and observe phenomena, looking more closely at the natural and humanly constructed world around them. They should be encouraged to be curious and ask questions about what they notice. They should be helped to develop their understanding of scientific ideas by using different types of scientific enquiry to answer their own questions, including observing changes over a period of time, noticing patterns, grouping and classifying things, carrying out simple comparative tests, and finding things out using secondary sources of information. They should begin to use simple scientific language to talk about what they have found out and communicate their ideas to a range of audiences in a variety of ways. Most of the learning about science should be done through the use of first-hand practical experiences, but there should also be some use of appropriate secondary sources, such as books, photographs and videos.	Lower Key Stage 2 The principal focus of science teaching in lower key stage 2 is to enable pupils to broaden their scientific view of the world around them. They should do this through exploring, talking about, testing and developing ideas about everyday phenomena and the relationships between living things and familiar environments, and by beginning to develop their ideas about functions, relationships and interactions. They should ask their own questions about what they observe and make some decisions about which types of scientific enquiry are likely to be the best ways of answering them, including observing changes over time, noticing patterns, grouping and classifying things, carrying out simple comparative and fair tests and finding things out using secondary sources of information. They should draw simple conclusions and use some scientific language, first, to talk about and, later, to write about what they have found out.	Upper Key Stage 2 The principal focus of science teaching in upper key stage 2 is to enable pupils to develop a deeper understanding of a wide range of scientific ideas. They should do this through exploring and talking about their ideas; asking their own questions about scientific phenomena; and analysing functions, relationships and interactions more systematically. At upper key stage 2, they should encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. They should also begin to recognise that scientific ideas change and develop over time. They should select the most appropriate ways to answer science questions using different types of scientific enquiry, including observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests and finding things out using a wide range of secondary sources of information. Pupils should draw conclusions based on their data and observations, use evidence to justify their ideas, and use their scientific knowledge and understanding to explain their findings
Working scientifically’ is described separately at the beginning of the programme of study, but must always be taught through and clearly related to substantive science content in the programme of study.			

Science Curriculum Statement of Intent: We aim to harness our children’s natural curiosity and inquisitiveness about the world. Our children are equipped with knowledge and understanding through fun and engaging scientific enquiries that have a real-world context. We aim to foster a love of investigation and actively promote independent discovery. We strive for our children to understand the uses and implications of science in the wider world, and to inspire them to become scientists of the future.

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Year 1	<u>Plants</u>	<u>Animals, including humans</u>	<u>Everyday Materials</u>	<u>Seasonal Changes</u>	<u>Working Scientifically</u>
	• 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.	• 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.	• 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.	• observe changes across the four seasons • observe and describe weather associated with the seasons and how day length varies. (This topic can be taught across the whole year)	• 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.

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Year 2	<u>Living Things and their Habitats</u>	<u>Plants</u>	<u>Animals, including Humans</u>	<u>Use of Everyday Materials</u>	<u>Working Scientifically</u>
	• 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 micro-habitats • 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.	• 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.	• 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.	• 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.	• 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.

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Year 3	Science					
	Plants	Animals, including Humans	Rocks	Light	Forces and Magnets	Working Scientifically
	• 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.	• 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.	• 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.	• 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 a solid object • find patterns in the way that the size of shadows change.	• 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.	• 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 • using straightforward scientific evidence to answer questions or to support their findings.

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Year 4	National Curriculum					
	Living Things and their Habitats	Animals, including Humans	States of Matter	Sound	Electricity	Working Scientifically
	• 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.	• 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.	• 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.	• 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.	• 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.	• 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 • using straightforward scientific evidence to answer questions or to support their findings.

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Year 5	<u>Living Things and their Habitats</u>	<u>Properties and Changes to Materials</u>	<u>Earth and Space</u>	<u>Forces</u>	<u>Working Scientifically</u>
	<u>Animals, including Humans</u>				
	• 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.	• 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.	• 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.	• 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.	• 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 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.

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Year 6	<u>Living Things and their Habitats</u>	<u>Animals, including Humans</u>	<u>Evolution and Inheritance</u>	<u>Light</u>	<u>Electricity</u>	<u>Working Scientifically</u>
	• 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.	• 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.	• 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.	• 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.	• 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.	• 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 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.

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	Key Skills and Knowledge		
	Beacon 1	Beacon 2	Beacon 3
Vocabulary Knowledge	Understand the following key vocabulary: Plants: habitat; variety; common; wild; garden; deciduous; evergreen; flowering; leaves; blossom; petals; roots; fruit; bulb; seed; trunk; branches; stem; germination; nutrition; reproduction Animals: fish; amphibians; reptiles; birds; mammals; carnivores; herbivores; omnivores; senses; head; neck; arms; elbows; legs; knees; face; ears; eyes; hair; mouth; teeth; textures; sound; smell; offspring; exercise; hygiene; nutrition; baby; toddler; child; teenager; adult Materials: object; wood; plastic; glass; metal; brick; paper; cardboard; water; rock; physical properties; waterproof; absorbent; opaque; transparent; solid; squashing; bending; twisting; stretching; suitable/unsuitable Seasons: weather; day, night, sun, autumn, winter, summer, spring, change Living Things: healthy; micro-habitat; living; dead; needs; shelter; seashore; woodland; ocean; rainforest; food chain	Understand the following key vocabulary: Plants: flowering; roots; stem; trunk; leaves; flowers; life; growth; air, light, water, nutrients, soil, transported, life cycle, pollination, seed formation; seed dispersal; fertiliser; reproduction; seeds; fruits; Animals: nutrition; skeletons; muscles; support; protection; movement; functions; diets; food groups; digestive system; producers; predators; prey; carnivores; herbivores; incisors; molars; canines Rocks: fossils; organic matter; soils; grains; crystals; sedimentary; Light: reflection; light source; opaque; shadows; Forces and Magnets: attract; repel, poles; magnetic materials; bar/ring/button/horseshoe magnets; strength; push; pull Living Things: environment; habitat; invertebrate and vertebrate animals; reptiles; amphibians; mammals; birds; flowering/non-flowering: ferns, mosses; human impact; population; litter; deforestation; States of Matter: solids; liquids; gases; heated; cooled; temperature; degrees Celsius; evaporation; condensation; water cycle; chemical change; change of state Sound: vibrations; medium; travel; pitch; volume; strength; distance; source; insulation Electricity: appliances; circuits; cells; wires; bulbs; switches; buzzers; battery; open and closed circuit; conductors; insulators; components;	Understand the following key vocabulary: Living Things and their Habitats: life cycles; mammals; amphibians; reptiles; birds; life processes; environment; naturalists; behaviourists; sexual and asexual reproduction; parent plant; seeds; stem; root cuttings; tubers; bulbs; micro-organisms Animals: old age; puberty; gestation; length; mass; heart; blood vessels; blood; circulatory system; diet; exercise; drugs; lifestyle; nutrients; transported; organs; skeletal; muscular; digestive; substances Materials: hardness; solubility; transparency; conductivity; insulation; circuit; heat source; electrical; thermal; magnetism; dissolve; solution; substance; solids; liquids; gases; separated; filtering; sieving; evaporating; changes of state; reversible and irreversible; burning; acid action; melting; rusting; reactions; polymers; Earth and Space: Earth; sun; moon; solar system; spherical bodies; rotation; movement; day and light; planets; Mercury; Venus, Earth, Mars, Jupiter; Saturn; Uranus; Neptune; dwarf planet; Neptune; celestial body; orbit Forces: gravity; air resistance; water resistance; friction; mechanisms; levers; pulleys; gears; Evolution and Inheritance: fossils; inhabited; offspring; adaptation; environment; Light: reflections; straight lines; light source; shadows Electricity: volume; voltage; series circuits; bulbs; buzzers; motors; switches; batteries; cells;

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	Key Skills and Knowledge		
	Beacon 1	Beacon 2	Beacon 3
Working Scientifically Skills	• Ask simple questions and recognise that they can be answered in different ways • Perform simple tests or follows teachers' instructions • Observes closely (including over time), using simple equipment • Gathers and records simple data to help in answering questions • Identifies and classifies • Use their observations and ideas to suggest answers to questions	• Ask relevant questions and use different types of scientific enquiry skills to answer them • Set up simple practical enquiries, comparative and fair tests • Makes systematic and careful observations • Makes accurate measurements using standard units, using a range of equipment, e.g. data loggers and thermometers • Gathers and records data in a variety of ways to help in answering questions • Records and presents findings using drawings, labelled diagrams, keys, tally charts, Carroll diagrams, Venn diagrams, bar charts and tables • Reports on findings from enquiries, in simple scientific language, using oral and written explanations, displays or presentations of results and conclusions • Identifies differences, similarities or changes related to simple scientific ideas and processes. • uses results to draw simple conclusions • Uses straightforward scientific evidence to answer questions or to support their findings • With support, uses results to suggest improvements to what they have done • With support, raises further questions (e.g. arising from the data) • With support, make predictions for new values	• Plans different types of scientific enquiries to answer questions • Recognises and controls variables where necessary • Takes measurements using a range of scientific equipment, with increasing accuracy and precision • Takes repeat readings where appropriate • Records data and results of increasing complexity • Records and presents findings using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs • Reports on findings from enquiries, using relevant scientific language and conventions, in oral and written explanations such as displays and other presentations • Identifies conclusions, causal relationships and explanations of results • Refer to the degree of trust • Identifies scientific evidence that has been used to support or refute ideas or arguments

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Beacon 1 (bold skills are statutory and a key focus)		Year 1	Topic Knowledge
Working Scientifically Skills	Ideas and Questioning	• Ask simple questions and recognise that they can be answered in different ways • Recognise scientific and technical developments that can help us	• Identify and name common, wild and garden plants, including deciduous and evergreen trees. • Identify and describe the basic structure of common flowering plants. • Identify and name animals including fish, amphibians, reptiles, birds and mammals. • Identify and name a variety of common animals that are carnivores, omnivores and herbivores • Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets) • Name, draw and label the basic parts of the human body and identify and recognise the five senses. • Distinguish between an object and the material from which it is made • Identify and name a variety of everyday materials. • Describe the simple physical properties of a variety of materials. • Compare and group together a variety of everyday materials on the basis of their simple physical properties • Observe changes across the four seasons. • Observe and describe weather associated with the seasons and how day length varies.
	Planning	• Perform simple tests or follows teachers' instructions • Experiences different types of planning enquiry • With guidance, suggests what they will do • With guidance, identifies things to measure or observe that are relevant to the question • Use resources provided or chosen from a limited range • Use simple measurements and equipment to gather data • Suggests why a test is unfair	
	Obtaining and Presenting Evidence	• Observes closely (including over time), using simple equipment • Makes measurements using non-standard units • Uses simple secondary resources to find answers, e.g. books, videos, photographs or people • Gathers and records simple data to help in answering questions • With support, prepares simple tables to record data	
	Considering and Evaluating Evidence	• With help, records their findings in a range of ways, e.g. simple tables, diagrams, pictograms, sorting circles, bar charts and templates • Talks about their findings using everyday terms, text scaffolds or simple scientific language • Uses simple observable features to compare objects, materials and living things • Identifies and classifies by deciding how to sort and group objects • With guidance, begins to notice changes, patterns (i.e. cause and effect) and relationships (i.e. how one variable affects another) • Use their observations and ideas to suggest answers to questions • Uses comparative language to describe changes, patterns and relationships • With support, suggests whether or not what happened was what they expected • With support, suggests different ways they could have done things	

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Beacon 1 (bold skills are statutory and a key focus)		Year 2	Topic Knowledge
Working Scientifically Skills	Ideas and Questioning	• Ask simple questions and recognise that they can be answered in different ways • Recognise scientific and technical developments that can help us	• 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 • 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 • 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 • Identify and compare the suitability of a variety of everyday materials including wood, metal, plastic, glass, brick, rock, paper and cardboard • Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching
	Planning	• Perform simple tests or follows teachers' instructions • Experiences different types of planning enquiry • With guidance, suggests what they will do • With guidance, identifies things to measure or observe that are relevant to the question • Use resources provided or chosen from a limited range • Use simple measurements and equipment to gather data • Suggests why a test is unfair	
	Obtaining and Presenting Evidence	• Observes closely (including over time), using simple equipment • Makes measurements using non-standard units • Uses simple secondary resources to find answers, e.g. books, videos, photographs or people • Gathers and records simple data to help in answering questions • With support, prepares simple tables to record data	
	Considering and Evaluating Evidence	• With help, records their findings in a range of ways, e.g. simple tables, diagrams, pictograms, sorting circles, bar charts and templates • Talks about their findings using everyday terms, text scaffolds or simple scientific language • Uses simple observable features to compare objects, materials and living things • Identifies and classifies by deciding how to sort and group objects • With guidance, begins to notice changes, patterns (i.e. cause and effect) and relationships (i.e. how one variable affects another) • Use their observations and ideas to suggest answers to questions • Uses comparative language to describe changes, patterns and relationships • With support, suggests whether or not what happened was what they expected • With support, suggests different ways they could have done things	

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Beacon 2 (bold skills are statutory and a key focus)		Year 3	Topic Knowledge
Working Scientifically Skills	Ideas and Questioning	• Ask relevant questions and use different types of scientific enquiry skills to answer them • Explain the purposes of a variety of scientific and technological developments	• Can identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. • Can explore the requirements of plants for life and growth 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 • Can identify that animals, including humans, need the right types and amount of nutrition and they cannot make their own food but get nutrition from what they eat. • Can identify that humans and some other animals have skeletons and muscles for support, protection and movement. • Can compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. • Can describe in simple terms how fossils are formed when things that have lived are trapped within rock. • Recognise the soils are made from rocks and organic matter • Can recognise that they need light in order to see things, that dark is the absence of light and 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 • Can recognise that shadows are formed when the light from a light source is blocked by an opaque object; Find patterns in the way the size of shadows change • Compare how things move on different surfaces • Notice that some forces need contact between two objects, but magnetic forces can act at a distance • Can observe how magnets attract or repel each other and attract some materials and not others; predict whether two magnets will attract or repel depending on which way the poles face. • 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
	Planning	• Set up simple practical enquiries, comparative and fair tests • Begins to make their own decisions about the most appropriate type of scientific enquiry to answer questions • Begins to make decisions about what observations to make and how long to make them for • Begin to choose the type of simple equipment that might be used from a reasonable range • Use appropriate equipment and measurements with reasonable accuracy • Recognises when a simple fair test is needed • With help, decides how to set up a fair test and control variables	
	Obtaining and Presenting Evidence	• Makes systematic and careful observations • Makes accurate measurements using standard units, using a range of equipment, e.g. data loggers and thermometers • Recognises when and how secondary sources might help answer questions that cannot be answered through practical investigations • Gathers and records data in a variety of ways to help in answering questions • Prepares own format for recording data • Makes decisions about how to record and analyse the data • Records and presents findings using drawings, labelled diagrams, keys, tally charts, Carroll diagrams, Venn diagrams, bar charts and tables • Reports on findings from enquiries, in simple scientific language, using oral and written explanations, displays or presentations of results and conclusions	
	Considering and Evaluating Evidence	• Uses observable and other criteria to group, sort and classify in different ways (including simple keys and branching databases) • Identifies differences, similarities or changes related to simple scientific ideas and processes. • With help, looks for changes, patterns and relationships in their data • With help, uses results to draw simple conclusions and answer questions using appropriate levels of knowledge and their own experiences • Uses straightforward scientific evidence to answer questions or the support their findings • Uses relevant scientific language to discuss their ideas and communicate their findings • With support, uses results to suggest improvements to what they have done • With support, raise further questions (e.g. arising from the data) • With support, makes predictions for new values within or beyond the data collected	

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Beacon 2 (bold skills are statutory and a key focus)			Year 4	Topic Knowledge
Working Scientifically Skills	Ideas and Questioning	• Ask relevant questions and use different types of scientific enquiry skills to answer them • Explain the purposes of a variety of scientific and technological developments		• Explore and use classification keys to help group, identify and name a variety of different things in their local and wider environment • Can recognise that living things can be grouped in a variety of different ways
	Planning	• Set up simple practical enquiries, comparative and fair tests • Begins to make their own decisions about the most appropriate type of scientific enquiry to answer questions • Begins to make decisions about what observations to make and how long to make them for • Begin to choose the type of simple equipment that might be used from a reasonable range • Use appropriate equipment and measurements with reasonable accuracy • Recognises when a simple fair test is needed • With help, decides how to set up a fair test and control variables		• Recognise that environments can change and pose dangers to living things • Describe the simple function of parts of the digestive system in humans, including teeth • Construct and interpret a variety of food chains, identifying predators, producers and prey • 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; measure or research the temperature at which this happens in degrees Celsius
	Obtaining and Presenting Evidence	• Makes systematic and careful observations • Makes accurate measurements using standard units, using a range of equipment, e.g. data loggers and thermometers • Recognises when and how secondary sources might help answer questions that cannot be answered through practical investigations • Gathers and records data in a variety of ways to help in answering questions • Prepares own format for recording data • Makes decisions about how to record and analyse the data • Records and presents findings using drawings, labelled diagrams, keys, tally charts, Carroll diagrams, Venn diagrams, bar charts and tables • Reports on findings from enquiries, in simple scientific language, using oral and written explanations, displays or presentations of results and conclusions		• Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature • Can identify how sounds are made associating some of them with something vibrating • Recognise that vibrations from sound 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 sound and the strength of vibrations; recognise that sounds get fainter as the distance from the sound source increases
	Considering and Evaluating Evidence	• Uses observable and other criteria to group, sort and classify in different ways (including simple keys and branching databases) • Identifies differences, similarities or changes related to simple scientific ideas and processes. • With help, looks for changes, patterns and relationships in their data • With help, uses results to draw simple conclusions and answer questions using appropriate levels of knowledge and their own experiences • Uses straightforward scientific evidence to answer questions or the support their findings • Uses relevant scientific language to discuss their ideas and communicate their findings • With support, uses results to suggest improvements to what they have done • With support, raise further questions (e.g. arising from the data) • With support, makes predictions for new values within or beyond the data collected		• 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.

Science

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Risk Takers, Good Citizens, Entrepreneurial

Beacon 3 (bold skills are statutory and a key focus)		Year 5	Topic Knowledge
Working Scientifically Skills	Ideas and Questioning	• Uses their scientific experiences to explore ideas and raise different types of questions • Talks about how scientific ideas have developed over time • Recognises the applications of specific scientific ideas	• Describe the differences in the life cycles of a mammal, amphibian, insect and bird • Describe the life process of reproduction in some plants and animals • Describe the changes as humans develop to old age. • 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 • 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 and 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 • 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
	Planning	• Selects and plans different types of scientific enquiries to answer questions • Makes decisions about what observations to make, what measurements to use, how long to make them for and whether to repeat them • Chooses the most appropriate equipment to make measurements • Explains how to use the equipment accurately • Recognises when and how to set up comparative and fair tests • Recognises and controls variables where necessary (e.g. explains which variables need to be controlled and why) • Takes measurements, in standard units, using a range of scientific equipment, with increasing accuracy and precision	
	Obtaining and Presenting Evidence	• Takes repeat readings where appropriate • Recognises which secondary sources will be most useful to research their ideas • Begins to separate opinion from fact • Records data and results of increasing complexity • Decides how to record data from a choice of familiar approaches • Calculates mean value where appropriate	
	Considering and Evaluating Evidence	• Records and presents findings using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs • Reports on findings from enquiries, using relevant scientific language and conventions, in oral and written explanations such as displays and other presentations • Uses and develops keys and other information records to identify, classify and describe living things and materials • Identifies conclusions, causal relationships and explanations of results • Identifies patterns that might be found in the natural environment • Draws valid conclusions, explains and interprets the results (including the degree of trust) using scientific knowledge and understanding (e.g. recognises limitations of data) • Identifies scientific evidence that has been used to support or refute ideas or arguments • Uses relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas • Makes practical suggestions about how their working method could be improved (e.g. sample size on reliability) • Uses results to identify when further tests and observations might be needed • Uses test results to make predictions and to set up further comparative and fair tests	

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Beacon 3 (bold skills are statutory and a key focus)		Year 6	Topic Knowledge
Working Scientifically Skills	Ideas and Questioning	• Uses their scientific experiences to explore ideas and raise different types of questions • Talks about how scientific ideas have developed over time • Recognises the applications of specific scientific ideas	• 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 • Identify and name the main parts of the 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 way in which nutrients and water are transported within animals including humans • 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 • Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eyes; use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them • 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
	Planning	• Selects and plans different types of scientific enquiries to answer questions • Makes decisions about what observations to make, what measurements to use, how long to make them for and whether to repeat them • Chooses the most appropriate equipment to make measurements • Explains how to use the equipment accurately • Recognises when and how to set up comparative and fair tests • Recognises and controls variables where necessary (e.g. explains which variables need to be controlled and why) • Takes measurements, in standard units, using a range of scientific equipment, with increasing accuracy and precision	
	Obtaining and Presenting Evidence	• Takes repeat readings where appropriate • Recognises which secondary sources will be most useful to research their ideas • Begins to separate opinion from fact • Records data and results of increasing complexity • Decides how to record data from a choice of familiar approaches • Calculates mean value where appropriate	
	Considering and Evaluating Evidence	• Records and presents findings using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs • Reports on findings from enquiries, using relevant scientific language and conventions, in oral and written explanations such as displays and other presentations • Uses and develops keys and other information records to identify, classify and describe living things and materials • Identifies conclusions, causal relationships and explanations of results • Identifies patterns that might be found in the natural environment • Draws valid conclusions, explains and interprets the results (including the degree of trust) using scientific knowledge and understanding (e.g. recognises limitations of data) • Identifies scientific evidence that has been used to support or refute ideas or arguments • Uses relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas • Makes practical suggestions about how their working method could be improved (e.g. sample size on reliability) • Uses results to identify when further tests and observations might be needed • Uses test results to make predictions and to set up further comparative and fair tests	