

Science Milestones Broken down into Year Groups

		Milestone 1	What this looks like in Year 1	What this looks like in Year 2
	To work scientifically	<ul style="list-style-type: none"> • Ask simple questions. • Observe closely, using simple equipment. • Perform simple tests. • Identify and classify. • Use observations and ideas to suggest answers to questions. • Gather and record data to help in answering questions. 	<ul style="list-style-type: none"> • Explore the world around them and raise their own questions • Experience different types of scientific enquiries • Recognise ways to answer scientific questions • Use simple features to compare objects, materials and living things • Decide how to sort and group these things • Observe changes over time • With guidance they should begin to notice patterns and relationships • Ask people questions and use simple secondary sources to answer questions • Use simple measurements and equipment (e.g. hand lenses, egg timers) to gather data, carry out simple tests, record simple data • Talk about what they have found out and how they found it out • With help, record and communicate their findings in a range of ways • Begin to use simple scientific language 	<ul style="list-style-type: none"> • Explore the world around them and raise their own questions • Experience different types of scientific enquiries • Recognise ways to answer scientific questions • Use simple features to compare objects, materials and living things • Decide how to sort and group these things • Observe changes over time • With guidance they should begin to notice patterns and relationships • Ask people questions and use simple secondary sources to answer questions • Use simple measurements and equipment (e.g. hand lenses, egg timers) to gather data, carry out simple tests, record simple data • Talk about what they have found out and how they found it out • With help, record and communicate their findings in a range of ways • Begin to use simple scientific language
Biology	To understand plants	<ul style="list-style-type: none"> • Identify and name a variety of common plants, including garden plants, wild plants and trees and those classified as deciduous and evergreen. • Identify and describe the basic structure of a variety of common flowering plants, including roots, stem/trunk, leaves and flowers. • 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 	<ul style="list-style-type: none"> • Use the local environment throughout the year to explore and answer questions about plants growing in their habitat. • Observe the growth of flowers and/or vegetables they have planted • Identify conditions needed for a plant to grow and stay healthy • Become familiar with common names of flowers and examples of deciduous and evergreen trees • Become familiar with 	<ul style="list-style-type: none"> • Use the local environment throughout the year to observe how different plants grow • Explore the conditions needed for germinations, growth and survival • Explore processes of reproduction • Observe and record with some accuracy, the growth of a variety of plants as they change over time from a seed or bulb • Set up a comparative test to show that plants

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		and stay healthy.	<p>plant structures (leaves, flowers, petals, fruit, roots, bulb, seed, trunk, branches, stem)</p> <ul style="list-style-type: none"> • Use magnifying glasses to observe closely • Compare and contrast familiar plants • Keep records of how a plant changes over time 	need light and water to stay healthy
To understand animals and humans	<ul style="list-style-type: none"> • Identify and name a variety of common animals that are birds, fish, amphibians, reptiles, mammals and invertebrates. • 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 (birds, fish, amphibians, reptiles, mammals and invertebrates, 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. • Investigate 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. 	<ul style="list-style-type: none"> • Use the local environment (The Secret Garden) throughout the year to explore and answer questions about animals in their habitat • Become familiar with the common names of some fish, amphibians, reptiles, birds and mammals, including those kept as pets • Compare and contrast animals at first hand or through videos and photographs describing how they identify and group them • Group animals according to what they eat • Describe the basic needs of animals, including humans, for survival • Describe how different animals, including humans, have offspring which grow into adults • Learn the names of the main human body parts through games, actions, songs and rhymes 	<ul style="list-style-type: none"> • Identify the basic needs of animal survival • Identify the importance of exercise and nutrition for humans • Introduced to the processes of reproduction and growth in animals (pupils are not expected to understand how reproduction occurs) • e.g. baby, toddler, child, teenager, adult; caterpillar, pupa, butterfly; spawn, tadpole, frog • Understand how to take care of animals taken from their local environment and the need to return them safely after study 	
To investigate living things	<ul style="list-style-type: none"> • Explore and compare the differences between things that are living, that are dead and 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. 	Not NC	<ul style="list-style-type: none"> • Explore the idea that all living things have certain characteristics that are essential for keeping them alive and healthy • Raise and answer questions that help them to become familiar with the life processes that are common in all living things • Identify 'habitats' and 'micro-habitats' • Study a variety of 	

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				<p>plants and animals within their habitat and observe how living things depend on each other (e.g. plants serving as a source of food and shelter for animals)</p> <ul style="list-style-type: none"> • Compare animals in familiar and less familiar habitats • Sort and classify living, dead or were never alive • Record findings using charts • Explore questions such as, 'is a flame alive?' 'Is a deciduous tree dead in winter?' • Construct simple food chains (grass, cow, human)
Chemistry	To investigate materials	<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. • <i>Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.</i> • <i>Identify and compare the uses of a variety of everyday materials, including wood, metal, plastic, glass, brick/rock, and paper/cardboard.</i> 	<ul style="list-style-type: none"> • Explore, name, discuss and raise and answer questions about everyday materials so that they become familiar with the names of materials and properties such as hard/soft, stretchy/stiff, shiny/dull, rough/smooth, bendy/not bendy, waterproof/not waterproof, absorbent/not absorbent, opaque/transparent • Experiment with a wide variety of materials, including: wood, plastic, glass, metal, water, rock, brick, fabrics, elastic, foil • Perform simple tests to explore questions, e.g. 'What is the best material for an umbrella?.... for lining a dog basket?... for curtains?....for a bookshelf.... for a gymnast's leotard?' 	<ul style="list-style-type: none"> • Identify and discuss the uses of everyday materials • become familiar with how some materials are used for more than one thing • become familiar with how different materials are used for the same thing • consider how the properties of materials make them suitable or unsuitable for particular purposes
Physics	To understand movement, forces and magnets	<ul style="list-style-type: none"> • Notice and describe how things move, using simple comparisons such as faster and slower. • Compare how different things 	<ul style="list-style-type: none"> • Observe and talk about changes in weather and the seasons • Understand that it is not safe to look directly at the sun, even when 	Not NC

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		<p>move.</p> <ul style="list-style-type: none"> • Observe the apparent movement of the Sun during the day. • Observe changes across the four seasons. • Observe and describe weather associated with the seasons and how day length varies. 	<p>wearing dark glasses</p> <ul style="list-style-type: none"> • Make tables and charts about the weather • Make displays about day length, as the seasons change 	
	To understand light and seeing	<ul style="list-style-type: none"> • Observe and name a variety of sources of light, including electric lights, flames and the Sun, explaining that we see things because light travels from them to our eyes. 	Not NC	Not NC
	To investigate sound and hearing	<ul style="list-style-type: none"> • Observe and name a variety of sources of sound, noticing that we hear with our ears. 	Not NC	Not NC
	To understand electrical circuits	<ul style="list-style-type: none"> • Identify common appliances that run on electricity. • Construct a simple series electrical circuit. 	Not NC	Not NC
	To understand the Earth's movement in space	<ul style="list-style-type: none"> • Observe the apparent movement of the Sun during the day. • Observe changes across the four seasons. • Observe and describe weather associated with the seasons and how day length varies. 	Not NC	Not NC

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		Milestone 2	What this looks like in Year 3	What this looks like in Year 4
	To work scientifically	<ul style="list-style-type: none"> • Ask relevant questions. • Set up simple practical enquiries and comparative and fair tests. • Make accurate measurements using standard units, using a range of equipment, e.g. thermometers and data loggers. • Gather, record, classify and present data in a variety of ways to help in answering questions. • Record findings using simple scientific language, drawings, labelled diagrams, bar charts and tables. • Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. • Use results to draw simple conclusions and suggest improvements, new questions and predictions for setting up further tests. • Identify differences, similarities or changes related to simple, scientific ideas and processes. • Use straightforward, scientific evidence to answer questions or to support their findings. 	<ul style="list-style-type: none"> • In a range of scientific experiences they raise their own questions • Start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions • Recognise when a simple fair test is necessary and help to decide how to set it up • Talk about criteria for grouping, sorting and classifying and use simple keys • Begin to look for naturally occurring patterns and decide what data to collect to identify them • Help make decisions about what observations to make, how long to make them and for the type of simple equipment that might be used • Learn how to use equipment, such as dataloggers • Collect data from own observations and measurements • Use notes, simple tables and standard units • Draw simple conclusions and answer questions • With support, identify new questions arising from data and make predictions within or beyond the data collected • Recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations • Use scientific language to discuss ideas and communicate findings 	<ul style="list-style-type: none"> • In a range of scientific experiences they raise their own questions • Start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions • Recognise when a simple fair test is necessary and help to decide how to set it up • Talk about criteria for grouping, sorting and classifying and use simple keys • Begin to look for naturally occurring patterns and decide what data to collect to identify them • Help make decisions about what observations to make, how long to make them and for the type of simple equipment that might be used Learn how to use equipment, such as dataloggers • Collect data from own observations and measurements • Use notes, simple tables and standard units • Draw simple conclusions and answer questions • With support, identify new questions arising from data and make predictions within or beyond the data collected • Recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations • Use scientific language to discuss ideas and communicate findings
Biology	To understand plants	<ul style="list-style-type: none"> • Identify and describe the functions of different parts of flowering plants: roots, stem, leaves and flowers. • Explore the requirements of 	<ul style="list-style-type: none"> • Explore questions about the role of the roots and stem in nutrition and support, leaves for nutrition and flowers for reproduction 	

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		<p>plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant.</p> <ul style="list-style-type: none"> • Investigate the way in which water is transported within plants. • Explore the role of flowers in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. 	<ul style="list-style-type: none"> • Compare the effect of different factors on plant growth, e.g. amount of light, fertiliser; looking for patterns in the structure of fruits that relate to how seeds are dispersed • Observe how water is transported in plants, e.g. by putting cut, white carnations into coloured water and observing how water travels up the stem to the flowers 	
To understand animals and humans	<ul style="list-style-type: none"> • Identify that animals, including humans, need the right types and amounts of nutrition, that they cannot make their own food and they get nutrition from what they eat. • Describe the ways in which nutrients and water are transported within animals, including humans. • Identify that humans and some animals have skeletons and muscles for support, protection and movement. • 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. 	<ul style="list-style-type: none"> • Learn about the importance of nutrition • Compare and contrast the diets of different animals (including their pets) and decide ways of grouping them • Research food groups and how they keep us healthy and design meals on what they find out. • Introduced to the main body parts associated with the skeleton and muscles • Find out how different body parts have different functions • Groups animals with and without skeletons and observing and comparing their movement • Explore ideas about what would happen if humans did not have skeletons • 	<ul style="list-style-type: none"> • Introduced to main body parts associated with the digestive system and explore questions which help the, to understand their functions • Compare teeth of carnivores and herbivores and suggest reasons for differences • Find out what damages teeth and how to look after them 	
To investigate living things	<ul style="list-style-type: none"> • Identify and name a variety of living things (plants and animals) in the local and wider environment, using classification keys to assign them to groups. • Give reasons for classifying plants and animals based on specific characteristics. • Recognise that environments are constantly changing and that this can sometimes pose dangers to specific habitats. 	Not NC	<ul style="list-style-type: none"> • Use the local environment throughout the year to raise and answer questions • Identify how a habitat changes throughout the year – visit the Environment Area to observe the changes in the habitats throughout the year. • Explore possible ways of grouping a wide selection of living things including animals and flowering plants and non-flowering plants • Group vertebrates and 	

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				<p>invertebrates</p> <p>Explore examples of human impact (positive and negative) on environments (eg nature reserves; deforestation)</p>
	<p>To understand evolution and inheritance</p>	<ul style="list-style-type: none"> • Identify how plants and animals, including humans, resemble their parents in many features. • Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. • Identify how animals and plants are suited to and adapt to their environment in different ways. 		<ul style="list-style-type: none"> •
Chemistry	<p>To investigate materials and states of matter</p>	<ul style="list-style-type: none"> • Compare and group together different kinds of rocks on the basis of their simple, physical properties. • Relate the simple physical properties of some rocks to their formation (igneous or sedimentary). • Describe in simple terms how fossils are formed when things that have lived are trapped within sedimentary rock. <p>Recognise that soils are made from rocks and organic matter</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 the temperature at which this happens in degrees Celsius (°C), building on their teaching in mathematics. • Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. 	<ul style="list-style-type: none"> • Explore different kinds of rocks and soils, including from the local environment • Observe rocks, including those in buildings, explore how they may have changed over time • Using a hand lens classify rocks according to whether they have fossils in them • Explore how fossils are formed • Explore different soils and identify similarities and differences between them • Investigate what happens when soils are rubbed together or what changes occur when they are in water • Raise and answer questions about the ways soils are formed 	<ul style="list-style-type: none"> • Explore a variety of everyday materials and describe simply their states of matter using their properties • Observe water as a solid, liquid and a gas • Note changes to water when it is heated or cooled • Explore the effect of temperature on substances eg chocolate, butter, cream • Observe and record evaporation over a period of time eg puddle on the playground • Investigate the effect of temperature on washing/drying or snowmen melting
Physics	<p>To understand movement, forces and magnets</p>	<ul style="list-style-type: none"> • compare how things move on different surfaces <p>Notice that some forces need contact between two objects and</p>	<ul style="list-style-type: none"> • Observe that magnetic forces can act without contact, unlike most forces, where direct contact is necessary 	<p>Not NC</p>

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		<p>some forces act at a distance.</p> <ul style="list-style-type: none"> • 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. <p>Describe magnets as having two poles</p> <p>Predict whether two magnets will attract or repel each other, depending on which poles are facing</p>	<p>(opening a door, pushing a swing)</p> <ul style="list-style-type: none"> • Explore the behaviour and everyday uses of different magnets (e.g. bar, ring, button, horseshow) • Raise questions and carry out tests to find out how things move on different surfaces • Gather and record data • Explore the strength (attracting and repelling) of different magnets and find a fair way to compare them • Sort materials into magnetic and not magnetic • Identify how properties of magnets make them useful in everyday items 	
	To understand light and seeing	<ul style="list-style-type: none"> • recognise that they need light in order to see things and that dark is the absence of light <p>Notice that light is reflected from surfaces.</p> <p>Recognise that light from the sun can be dangerous and that there are ways to protect their eyes</p> <ul style="list-style-type: none"> • Associate shadows with a light source being blocked by something; find patterns that determine the size of shadows. 	<ul style="list-style-type: none"> • Explore what happens when light reflects off a mirror or other reflective surfaces • Think about why it is important to protect their eyes from bright lights • Find out what might cause the shadows to change • Look for patterns in what happens to shadows when the light source moves or the distance between the light source and the object changes • Investigate the need for light and that dark is the absence of light 	Not NC
	To investigate sound and hearing	<ul style="list-style-type: none"> • Identify how sounds are made, associating some of them with something vibrating. • Recognise that sounds get fainter as the distance from the sound's source increases. <p>Find patterns between pitch of a sound and features of the object that produced it</p> <p>Find patterns between the volume of sound and the</p>	Not NC	<ul style="list-style-type: none"> • Explore and identify the way sound is made through vibration in a range of different musical instruments <i>from around the world</i> • Investigate how sound travels through the ear • Find out how the pitch and volume of sounds can be changed in a variety of ways • Find patterns in the sounds made by different

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		<p>strength of the vibrations that produced it</p>		<p>objects eg different sized saucepan lids or elastic bands with different thicknesses</p> <ul style="list-style-type: none"> • Make earmuffs to investigate which material provides the best insulation against sound • Make and play their own instruments using what they have found out about pitch and volume
	<p>To understand electrical circuits</p>	<ul style="list-style-type: none"> • identify common appliances which run on electricity <p>Construct a simple series circuit and identify its main basic parts</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> <ul style="list-style-type: none"> • Recognise that a switch notopens 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>Not NC</p>	<ul style="list-style-type: none"> • Construct simple series circuits, trying different components • Create simple devices using a circuit • Draw circuits as pictorial representation • Understand the precautions for working safely with electricity • Observe patterns e.g. bulbs get brighter of more cells are added; metals tend to be conductors of electricity
	<p>To understand the Earth's movement in space</p>	<ul style="list-style-type: none"> • Describe the movement of the Earth relative to the Sun in the solar system. • Describe the movement of the Moon relative to the Earth. 	<p>Not NC</p>	<p>Not NC</p>

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		Milestone 3	What this looks like in Year 5	What this looks like in Year 6
	To work scientifically	<ul style="list-style-type: none"> • Plan enquiries, including recognising and controlling variables where necessary. • Use appropriate techniques, apparatus, and materials during fieldwork and laboratory work. • Take measurements, using a range of scientific equipment, with increasing accuracy and precision. • Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, bar and line graphs, and models. • Report findings from enquiries, including oral and written explanations of results, explanations involving causal relationships, and conclusions. • Present findings in written form, displays and other presentations. • Use test results to make predictions to set up further comparative and fair tests. • Use simple models to describe scientific ideas, identifying scientific evidence that has been used to support or refute ideas or arguments. 	<ul style="list-style-type: none"> • Explore ideas and raise different types of questions • Select and plan the most appropriate type of scientific enquiry to use to answer specific questions • Recognise when and how to set up comparative and fair tests and explain which variables need to be controlled and why • Use and develop keys and other information records to identify, classify and describe living things and materials and identify patterns that might be found in the natural environment • Make own decisions about what observations to use and how long to make them for and whether to repeat them • Choose the most appropriate equipment to make measurements and explain how to use it accurately • Decide how to record data from a choice of familiar approaches, look for different causal relationships in their data and identify when further tests and observations might be needed • Recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact • Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas and talk about how scientific ideas have developed over time 	<ul style="list-style-type: none"> • Explore ideas and raise different types of questions • Select and plan the most appropriate type of scientific enquiry to use to answer specific questions • Recognise when and how to set up comparative and fair tests and explain which variables need to be controlled and why • Use and develop keys and other information records to identify, classify and describe living things and materials and identify patterns that might be found in the natural environment • Make own decisions about what observations to use and how long to make them for and whether to repeat them • Choose the most appropriate equipment to make measurements and explain how to use it accurately • Decide how to record data from a choice of familiar approaches, look for different causal relationships in their data and identify when further tests and observations might be needed • Recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact • Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas and talk about how scientific ideas have developed over time
Biology	To understand plants	<ul style="list-style-type: none"> • Relate knowledge of plants to studies of evolution and inheritance. • Relate knowledge of plants 	Environmental area.	

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		to studies of all living things.		
	To understand animals and humans	<ul style="list-style-type: none"> • describe the changes the changes as humans develop to old age 	<ul style="list-style-type: none"> • Draw a timeline to indicate stages in the growth and development of humans • Learn about the changes in puberty • Research the gestation periods of other animals and compare them with humans • Compare by finding out and record the length and mass of a baby as it grows. 	<ul style="list-style-type: none"> • Pupils should build on their learning from years 3 and 4 about the main body parts and internal organs (skeletal, muscular and digestive system) to explore and answer questions that help them to understand how the circulatory system enables the body to function. • learn how to keep their bodies healthy and how their bodies might be damaged – including how some drugs and other substances can be harmful to the human body. • work scientifically by: exploring the work of scientists and scientific research about the relationship between diet, exercise, drugs, lifestyle and health.
	To investigate living things	<ul style="list-style-type: none"> • Describe the life cycles common to a variety of animals, including humans (birth, growth, development, reproduction, death), and to a variety of plants (growth, reproduction and death). • Explain the classification of living things into broad groups according to common, observable characteristics and based on similarities and differences, including plants, animals and micro-organisms. • Describe the life process of reproduction in some plants and animals. • Describe the changes as humans develop from birth to old age. • Recognise the impact of diet, exercise, drugs and lifestyle on the way human bodies function. 	<ul style="list-style-type: none"> • Study and raise questions about their local environment throughout the year. (Environmental area) • Observe life-cycle changes in a variety of living things, eg plants in the vegetable garden or flower border and animals in their local environment. (Environmental area) • Find out about the work of naturalists and animal behaviourists e.g. David Attenborough and Jane Goodall • Find out about different types of reproduction, including sexual and asexual reproduction in plants and sexual reproduction in animals • Observe and compare life cycles of plants and animals in their local environment with other plants and animals around the world (rainforest, oceans, deserts and prehistoric times) • Ask pertinent questions and suggest reasons for 	<ul style="list-style-type: none"> • Pupils should build on their learning about grouping living things in year 4 by looking at the classification system in more detail. • They should be introduced to the idea that broad groupings, such as micro-organisms, plants and animals can be subdivided. • Through direct observations in the environmental area, they should classify animals into commonly found invertebrates (such as insects, spiders, snails, worms) and vertebrates (fish, amphibians, reptiles, birds and mammals). • discuss reasons why living things are placed in one group and not another. • find out about the significance of the work of scientists such as Carl Linnaeus, a pioneer of classification. • work scientifically by: using classification systems and keys to identify some animals and plants in the immediate environment. • research unfamiliar animals and plants from a

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			<p>similarities and differences</p> <ul style="list-style-type: none"> • Grow new plants from different parts of the parent plant eg seeds, stem and root cuttings, tubers, bulbs • Observe changes in an animal over a period of time (eg hatching and rearing chicks) • Compare how different animals reproduce and grow 	<p>broad range of other habitats and decide where they belong in the classification system.</p>
<p>To understand evolution and inheritance</p>		<ul style="list-style-type: none"> • Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. • Describe how adaptation leads to evolution. • Recognise how and why the human skeleton has changed over time, since we separated from other primates. 		<ul style="list-style-type: none"> • Building on what they learned about fossils in the topic on rocks in year 3, pupils should find out more about how living things on earth have changed over time. • They should be introduced to the idea that characteristics are passed from parents to their offspring, for instance by considering different breeds of dogs, and what happens when, for example, labradors are crossed with poodles. • appreciate that variation in offspring over time can make animals more or less able to survive in particular environments, for example, by exploring how giraffes' necks got longer, or the development of insulating fur on the arctic fox. • find out about the work of palaeontologists such as Mary Anning and about how Charles Darwin and Alfred Wallace developed their ideas on evolution. <p>Note: At this stage, pupils are not expected to understand how genes and chromosomes work.</p> <ul style="list-style-type: none"> • work scientifically by: observing and raising questions about local animals and how they are adapted to their environment; comparing how some living things are adapted to survive in extreme conditions, for example, cactuses,

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				<p>penguins and camels.</p> <ul style="list-style-type: none"> analyse the advantages and disadvantages of specific adaptations, such as being on two feet rather than four, having a long or a short beak, having gills or lungs, tendrils on climbing plants, brightly coloured and scented flowers.
Chemistry	To investigate materials	<ul style="list-style-type: none"> Compare and group together everyday materials based on evidence from comparative and fair tests, including their hardness, solubility, conductivity (electrical and thermal), and response to magnets. Understand how 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, oxidation and the action of acid on bicarbonate of soda. 	<ul style="list-style-type: none"> build a more systematic understanding of materials by exploring and comparing the properties of a broad range of materials, including relating these to what they learnt about magnetism in year 3 and about electricity in year 4. explore reversible changes, including, evaporating, filtering, sieving, melting and dissolving, recognising that melting and dissolving are different processes. explore changes that are difficult to reverse, for example, burning, rusting and other reactions, for example, vinegar with bicarbonate of soda. find out about how chemists create new materials, for example, Spencer Silver, who invented the glue for sticky notes or Ruth Benerito, who invented wrinkle-free cotton. <p><i>(NB: pupils are not required to make quantitative measurements about conductivity and insulation at this stage. It is sufficient for them to observe that some conductors will produce a brighter bulb in a circuit than others and that some materials will feel hotter than others when a heat source is placed against them. Safety guidelines should be followed when burning materials.)</i></p> <ul style="list-style-type: none"> work scientifically by: carrying out tests to answer questions, for example, 'Which materials would be the most effective for making a warm jacket, for wrapping ice cream to stop it melting, or for making blackout curtains?' compare materials 	

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			<p>in order to make a switch in a circuit.</p> <ul style="list-style-type: none"> ▪ observe and compare the changes that take place, for example, when burning different materials or baking bread or cakes. ▪ research and discuss how chemical changes have an impact on our lives, for example, cooking, and discuss the creative use of new materials such as polymers, super-sticky and super-thin materials 	
<p>Physics</p>	<p>To understand movement, forces and magnets</p>	<ul style="list-style-type: none"> • Describe magnets as having two poles. • Predict whether two magnets will attract or repel each other, depending on which poles are facing. • Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. • Identify the effect of drag forces, such as air resistance, water resistance and friction that act between moving surfaces. • Describe, in terms of drag forces, why moving objects that are not driven tend to slow down. • Understand that force and motion can be transferred through mechanical devices such as gears, pulleys, levers and springs. 	<ul style="list-style-type: none"> ▪ explore falling objects and raise questions about the effects of air resistance. ▪ explore the effects of air resistance by observing how different objects such as parachutes and sycamore seeds fall. ▪ experience forces that make things begin to move, get faster or slow down. ▪ explore the effects of friction on movement and find out how it slows or stops moving objects, for example, by observing the effects of a brake on a bicycle wheel. ▪ explore the effects of levers, pulleys and simple machines on movement. ▪ find out how scientists, for example, Galileo Galilei and Isaac Newton helped to develop the theory of gravitation. ▪ work scientifically by: exploring falling paper cones or cup-cake cases, and designing and making a variety of parachutes and carrying out fair tests to determine which designs are the most effective. ▪ explore resistance in water by making and testing boats of different shapes. ▪ design and make products that use levers, pulleys, gears and/or springs and explore their 	

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			effects.	
	To understand light and seeing	<ul style="list-style-type: none"> • Understand 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 eyes. • Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them, and to predict the size of shadows when the position of the light source changes. 		<ul style="list-style-type: none"> • Pupils should build on the work on light in year 3, exploring the way that light behaves, including light sources, reflection and shadows. • talk about what happens and make predictions. • work scientifically by: deciding where to place rear-view mirrors on cars; • designing and making a periscope and using the idea that light appears to travel in straight lines to explain how it works. • investigate the relationship between light sources, objects and shadows by using shadow puppets. • extend their experience of light by looking a range of phenomena including rainbows, colours on soap bubbles, objects looking bent in water and coloured filters (they do not need to explain why these phenomena occur).
	To investigate sound and hearing	<ul style="list-style-type: none"> • 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. 		
	To understand electrical circuits	<ul style="list-style-type: none"> • Identify and name the basic parts of a simple electrical circuit, including cells, wires, bulbs, switches and buzzers. • 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. 		<ul style="list-style-type: none"> • Building on their work in year 4, pupils should construct simple series circuits, to help them to answer questions about what happens when they try different components, for example, switches, bulbs, buzzers and motors. • learn how to represent a simple circuit in a diagram using recognised symbols. <p>Note: Pupils are expected to learn only about series circuits, not parallel circuits. Pupils should be taught to take the necessary precautions for working safely with</p>

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				<p>electricity.</p> <ul style="list-style-type: none"> • work scientifically by: systematically identifying the effect of changing one component at a time in a circuit.
	<p>To understand the Earth's movement in space</p>	<ul style="list-style-type: none"> • Describe the Sun, Earth and Moon as approximately spherical bodies. • Use the idea of the Earth's rotation to explain day and night. 	<ul style="list-style-type: none"> ▪ Pupils should be introduced to a model of the Sun and Earth that enables them to explain day and night. ▪ learn that the Sun is a star at the centre of our solar system and that it has eight planets: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune (Pluto was reclassified as a 'dwarf planet' in 2006). ▪ understand that a moon is a celestial body that orbits a planet (Earth has one moon; Jupiter has four large moons and numerous smaller ones). Note: Pupils should be warned that it is not safe to look directly at the Sun, even when wearing dark glasses. ▪ find out about the way that ideas about the solar system have developed, understanding how the geocentric model of the solar system gave way to the heliocentric model by considering the work of scientists such as Ptolemy, Alhazen and Copernicus. ▪ work scientifically by: comparing the time of day at different places on the Earth through internet links and direct communication; creating simple models of the solar system; constructing simple shadow clocks and sundials, calibrated to show midday and the start and end of the school day; finding out why some people think that structures such as Stonehenge might have been used as astronomical clocks 	