Science Curriculum Knowledge and Skills Progression Map

National Curriculum Subject Content

KS1	LKS2	UKS2
• Pupils should experience and observe phenomena, looking more closely at the natural and humanly constructed world around them • They should show curiosity, asking questions about what they have noticed • They should develop their understanding of scientific ideas through the use of different types of scientific enquiry to answer their own questions, including observing changes over 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	• Pupils should broaden their scientific view of the world around them through exploring, talking about, testing and developing ideas about everyday phenomena and the relationships between living and non-living things and familiar environments and by beginning to develop 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, to both talk about and write about what they have found out • They should read and spell scientific vocabulary correctly and with confidence, using their growing word and spelling knowledge.	• Pupils should develop a deeper understanding of a wide range of scientific ideas through exploring and talking about their ideas; asking their own questions about scientific phenomena; and analysing functions, relationships and interactions more systematically • They should encounter more abstract ideas and begin to recognise how these help them to understand and predict how the world operates • They should begin to recognise that scientific ideas change over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative fair tests and finding things out using a wide range of secondary sources of information • They should draw conclusions based on their data and observations, using evidence to justify their ideas and their scientific knowledge and understanding to explain their findings • They should read, spell and pronounce scientific vocabulary correctly

<table>
<tr><td colspan="5">KS1 national curriculum strands</td></tr>
<tr><td>KS1 Working Scientifically</td><td colspan="4">Year 1</td></tr>
<tr><td rowspan="3">• 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</td><td colspan="2">Biology</td><td>Chemistry</td><td>Physics</td></tr>
<tr><td>Animals including humans
• 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</td><td>Plants
• 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</td><td>Everyday Materials
• 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</td><td>Seasonal Changes
• Observe changes across the four seasons
• Observe and describe weather associated with the seasons and how day length varies</td></tr>
<tr><td colspan="4">Year 2</td></tr>
<tr><td colspan="3">Biology</td><td>Chemistry</td></tr>
<tr><td>Animals, including humans
• Notice that animals, including humans, have offspring which grow into adults</td><td>Living things and their habitats
• Explore and compare the differences between things that are living, dead, and</td><td>Plants
• observe and describe how seeds and bulbs grow into mature plants
• Find out and describe how plants need water, light and a suitable</td><td>Use of everyday Materials
• Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses</td></tr>
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	• 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 •	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	temperature to grow and stay healthy	• Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.

Lower Key Stage 2 National Curriculum Strands					
LKS2 Working Scientifically	**Year 3**				
• 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	**Biology**		**Chemistry**	**Physics**	
	Animals, including humans - Animals and Me (T2)	**Plants (T6)**	**Rocks and Soils (T1)**	**Forces and Magnets (T3/4)**	**Light and Shadow (T5)**
	Year 4				
	Biology		**Chemistry**	**Physics**	
	Animals, including humans - Teeth and Digestion (T3/4)	**Living things and their habitats - Classification (T6)**	**States of Matter (T5)**	**Electricity (T1)**	**Sounds (T2)**

<table>
<tr><td colspan="6">Upper Key Stage 2 National Curriculum Strands</td></tr>
<tr><td>UKS2 Working Scientifically</td><td colspan="5">Year 5</td></tr>
<tr><td rowspan="6">• 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</td><td colspan="2">Biology</td><td>Chemistry</td><td colspan="2">Physics</td></tr>
<tr><td>Animals, including humans – Life cycle of humans (T5/6)</td><td>Living things and their habitats – Life cycles of plants and animals (T5/6)</td><td>Properties and Changes of Materials (T1)</td><td>Earth and Space (T3/4)</td><td>Forces (T2)</td></tr>
<tr><td colspan="5">Year 6</td></tr>
<tr><td colspan="3"></td><td colspan="2">Physics</td></tr>
<tr><td>Animals, including humans (T1/2)</td><td>Living things and their habitats – classification (T4)</td><td>Evolution and Inheritance (T5</td><td>Light (T3)</td><td>Electricity (T6)</td></tr>
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Year 3

	Rocks and Soils	Animals, including humans - Animals and Me	Forces and Magnets	Light and Shadow	Living things and their habitats - Plants
Knowledge **Animals, including humans** • Know 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 • Know that humans and some other animals have skeletons and muscles for support, protection and movement. **Plants** • Know and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers • Know 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 • Know the way in which water is transported within plants • Know the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal **Rocks and soils**	• Know the difference between natural and man-made 'rocks' e.g. bricks • Know that igneous rocks are formed by molten rock • Know that sedimentary rocks are formed from particles • Know that metamorphic rocks are changed from their original state by heat and pressure • Know the process by which a fossil is formed • Know that soil is made from a mixture of rocks and organic matter.	• Know that animals, unlike plants which can make their own food, need to eat in order to get the nutrients they need • Know that food contains a range of different nutrients that are needed by the body to stay healthy – carbohydrates including sugars, protein, vitamins, minerals, fibre, fat, sugars and water. • Know that a piece of food will often provide a range of nutrients • Know that in order for humans to be healthy and active they need to eat a balanced diet, which contains eating all the different nutrients the body needs in the correct proportions • Know that pre-packed foods have labels on them to show the different quantities of	• Compare how things move on different surfaces – explore the effects of friction • Recognise pulling and pushing forces • Know that a magnet has a north and south pole • Know that these poles affect if a magnet is attracted or repelled by another. • Know that a magnet is only attracted to an item made out of iron	• Know that in order to see, we need light • Know what a light source is • Know what a reflector is and that light is reflected in varying degrees from most surfaces • Know that UV rays are given off by the sun • Know ways to keep yourself safe from the harmful effects of UV rays. • Know the differences between transparent, translucent and opaque • Know that a shadow is formed when a light source is blocked by an object.	• Identify the stem, root, flower and leaf and their functions • Know that a plant needs air, light, nutrients and space to grow. • Know that these requirements change between plants. • Know that water is transported within plants by the xylem and phloem • Know the life cycle of a plant – including germination, pollination and fertilisation. • Know how some different seeds disperse

• Know that fossils are formed when things that have lived are trapped within rock • Know that soils are made from rocks and organic matter. • Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties **Forces and Magnets** • Compare how things move on different surfaces • Know that some forces need contact between two objects, but magnetic forces can act at a distance • Know that magnets attract or repel each other depending on which way the poles are facing • Know that magnets attract some materials and not others • Know that magnets have two poles **Light and Shadow** • Know that we need light in order to see things and that dark is the absence of light • Know that light is reflected from surfaces • Know that light from the sun can be dangerous and that there are ways to protect their eyes • Know that shadows are formed when the light from a light source is blocked by an opaque object		nutrients they have in them • Know the difference between a herbivore, omnivore and carnivore • Know that an animal's diet is dependent on what food is available and the habitat in which they live • Humans and some other animals have skeletons and muscles for support, protection and movement • Know that animals can be classified into vertebrates (have a backbone) and invertebrates (don't have a backbone) • Know that some animals have an exoskeleton (outside of the body) and that some have an endoskeletons (inside the body) • Know that there are 206 bones in the human body • Know some of the scientific names for the bones in the human body, including the cranium, clavicle and scapula			

• Know what causes the size of a shadow to change		• To know that a joint is where two bones meet and give examples of different types of joints e.g. (Hinge, Saddle, Ball and Socket, Gliding and Pivot) • Know that muscles help us to move out bones and that they work in pairs			
Cross-curricular links					
Skills • Asks relevant questions and uses different types of scientific enquiries to answer them • Sets up simple practical enquiries, comparative and fair tests • Makes systematic and careful observations and, where appropriate, takes accurate measurements using standard units, using a range of equipment, including thermometers and data loggers • Gathers, records, classifies and presents data in a variety of ways to help answer questions • Records findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables • Reports on findings from enquiries, including oral and written explanations, displays or	• Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties (Test rocks to compare their hardness, texture, density and permeability)*** • Investigate soil permeability**	• Classify which foods belong to each food group • Plan a healthy meal, which provides a good balance of nutrients. Record and present findings ** • Use secondary sources to research the different foods animals eat from different world countries ** • Classify animals into vertebrates and invertebrates • Classify and compare animals with endoskeletons and exoskeletons	• Compare how things move on different surfaces – explore the effects of friction ***** • Observe the effects of magnets on other magnets • Observe the effects of magnets on different objects.	• Investigate transparency and opacity and how this affects shadows. ***** • Investigate how shadows change size. ****	• Explore what a plant needs to survive ***

presentations of results and conclusions • Uses results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions • Identifies differences, similarities or changes related to simple scientific ideas and processes • Uses straightforward scientific evidence to answer questions or to support their findings					
Year 4					
	Electricity	**Sounds**	**Animals, including humans - Teeth and Digestion**	**Changes of State**	**Living things and their habitats - Classification**
Knowledge **Animals, including humans - Teeth and Digestion** • 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 • Know how to construct and interpret a variety of food chains, identifying producers, predators and prey **Living things and their habitats - Classification** • Know that living things can be grouped in a variety of ways • Know how to use classification keys to help group, identify and	• Know the difference between mains electricity and battery power • Be able to identify items that run on electricity – both mains and battery. • Understand that a circuit has to be a closed loop with a cell • Know that electrons travel around a circuit, so if a circuit is broken, it does not work • Be able to make various circuits, including using bulbs,	• Know that sounds are caused by something vibrating • Know that sound has to travel through a medium into our ear. • Know that sounds get quieter as they get further away. • Know what pitch is and draw this as a sound wave • Know what volume is and draw this as a sound wave. • Know that the stronger the vibration, the louder the sound •	• Describe the parts of the digestive system (mouth, oesophagus, gall bladder, large intestine, small intestine, liver, stomach, rectum, anus) and their functions. • Know the different types of teeth (Incisor, canine and molar) and their functions • Know the structure of a tooth (crown, nerve, dentine, gums, root, jawbone, enamel) and their function.	• Know the properties of a solid • Know the properties of a liquid • Know the properties of a gas • Know how evaporation happens and that it is when a liquid turns to a gas by being given extra energy in the form of heat • Know how condensation happens and that it is when a gas turns to a liquid by the extra (heat) energy being taken away.	• Know the features of a mammal, amphibian, bird, reptile and fish. • Classify different animals into these categories. • Use different classification keys • Create different classification keys • Recognise that environments can change, and this can cause dangers to animals. (Coral bleaching, littering, endangered species, volcano damage – I

name a variety of living things in their local and wider environment • Recognise that environments can change and that this can sometimes pose dangers to living things **States of Matter** • Know the properties of solids, liquids or gases • know that some materials change state when they are heated or cooled, and know 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 **Electricity** • Identify common appliances that run on electricity • Know how a simple series electrical circuit is constructed, 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	buzzers, wires cells, motors and switches. • Understand that a switch allows a circuit to be complete (on) or broken (off) • Understand the terms electrical insulator and electrical conductor • Recognise some conductors and insulators.		• Understand that sugar can affect a tooth's enamel. • Understand the terms predator, prey, producer, consumer, carnivore, herbivore and omnivore. • Be able to attribute these traits to different organisms • Be able to arrange these into various food chains.	• Know that melting is when a solid turns to a liquid because it is given extra energy in the form of heat • Know that freezing or solidifying is when a liquid turns to a solid because the extra (heat) energy is taken away. • Know the role played by evaporation and condensation in the water cycle.	think this is now done in environmental week)

• Recognise some common conductors and insulators, and associate metals with being good conductors **Sounds** • Identify how sounds are made, associating some of them with something vibrating • Recognise that vibrations from sounds travel through a medium to the ear • Know that the pitch of a sound is related to the features of the object that produced the sound (Smaller, shorter, thinner, tighter and denser objects make more high-pitched sounds. Larger, longer, thicker, looser and less-dense objects make more low-pitched sounds) • Know that there is a relationship between the volume of a sound is related to the strength of the vibration (large vibrations give louder sounds) • Recognise that sounds get fainter as the distance from the sound source increases					
Cross-curricular links				Geography – the water cycle	
Skills • Asks relevant questions and uses different types of scientific enquiries to answer them	• Be able to make various circuits, including using bulbs, buzzers, wires cells, motors and switches.	• Find patterns between the pitch of a sound and features of the object that produced it	• Plan and execute an investigation into different drinks' effects on eggs (representing	• Investigate gases • Investigate melting ** • Investigate the rate of evaporation *****	• Create and use different classification keys

• Sets up simple practical enquiries, comparative and fair tests • Makes systematic and careful observations and, where appropriate, takes accurate measurements using standard units, using a range of equipment, including thermometers and data loggers • Gathers, records, classifies and presents data in a variety of ways to help answer questions • Records findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables • Reports on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions • Uses results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions • Identifies differences, similarities or changes related to simple scientific ideas and processes • Uses straightforward scientific evidence to answer questions or to support their findings	• Investigate whether the number of bulbs in a circuit affects its brightness. *** • Investigate if a material is an insulator or a conductor of electricity.	• Find patterns between the volume of a sound and the strength of the vibrations that produced it ****** •	the tooth's enamel. ***** •		
Year 5					

	Properties and Changes of Materials	Forces	Earth and Space	Animals, including humans – Life cycle of humans	Living things and their habitats – Life cycles of plants and animals
Knowledge **Animals, including humans** • Describe the changes as humans develop to old age **Living things and their habitats** • 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 **Properties and Changes of Materials** • Know that everyday materials can be grouped 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	• Know that some solids dissolve in a liquid. These are called soluble. • Know that some solids do not dissolve in a liquid. These are called insoluble. • Know that the solid is called a solute and the liquid a solvent. • Know that when a solute has dissolved in a solvent, the result is called a solution. • Know that evaporation is the inverse of dissolving and that you can evaporate off the liquid to leave behind the solid. • Know that dissolving is a reversible change. • Know that mixing is a reversible change. • Know other reversible changes like melting ice. • Know the properties of solids, liquids and gases.	• Know how pulleys work • Know how levers work • Know how gears work • Know that mechanisms allow smaller forces to have a greater effect. • Understand the effects of friction • Understand the effects of water resistance • Understand the effects of air resistance • Understand that gravity is the Earth's pull, making objects 'fall' downwards. • Recognise the links between mass and weight and the differences between them • Know that Isaac Newton first explored the effects of gravity.	• Know the Earth, sun and planets are roughly spherical • Know the names and the order of the eight planets in the solar system • Know the approximate, relative size of the planets and their distance from the sun. • Know that the first four planets are rocky planets and that the last four are gas giants. • Know that different planets have different amounts of moons and that the Earth has one • Know that Earth's moon orbits Earth and that this takes 28days. • Know that the orbit of the moon is why we see different phases of the moon. Know the names of these different phases. • Know that the Earth rotates on its axis, and this is why we have	• Know and understand the terms baby, toddler, child, teenager, adult and elderly person. • Know the order these go in • Understand that babies, toddlers, children and elderly people cannot reproduce.	• Know the life processes of living things – Movement, reproduction, sensitivity, nutrition, excretion, respiration, growth • Know the parts of a flower – petals, sepals, stigma, style, ovary, anther, filament, pollen. • Know the difference between and functions of the male and female parts of a flower. • Know how pollination works • Know that seeds are different shapes to allow them to disperse. • Understand wind, water, animal and explosion methods of seed dispersal. • Know what germination is and what a seed needs in order to germinate (water, light, heat) • Know the life cycle of an insect

everyday materials, including metals, wood and plastic • Know that dissolving, mixing and changes of state are reversible changes • Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda. **Earth and Space** • Describe the movement of the Earth, and other planets, relative to the Sun in the solar system • Describe the movement of the Moon relative to the Earth • Describe the Sun, Earth and Moon as approximately spherical bodies • Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky. **Forces** • 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,	• Understand how filtering, sieving and evaporating work. • Know that irreversible changes result in the formation of new materials. • Know and understand the following terms: hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets • Know that these properties mean that there are different uses for these materials.		night-time and daytime. • Know that this takes 24 hours. • Know that the Earth orbits the sun and this takes 365.25 days. • Know that a combination of the Earth's orbit of the sun and its tilt on its axis is the reason we have seasons.		• Know the life cycles of a bird, mammal, reptile, amphibian and fish

pulleys and gears, allow a smaller force to have a greater effect					
Cross-curricular links			Space – English Geography	PHSE – growing up	
Skills • Plans different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary • Takes measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate • Records data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs • Reports and presents 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 • Uses test results to make predictions to set up further comparative and fair tests • Identifies scientific evidence that has been used to support or refute ideas or arguments	• Test hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets of various materials. * • Watch demonstrations of various irreversible reactions and record the results. *	• Test various pulleys, gears and levers to explore their effects. * • Investigate friction * • Investigate how shape affects water resistance* • Investigate how the size of a parachute affects air resistance***** • Use results form size investigation to investigate other variables. ***** • Recognise the link between mass and weight *	Demonstrate how the sun can only shine on half the Earth at a time and that is creates night-time and daytime. *		• Investigate whether a seed needs light, heat or water more in order to germinate. ****
Year 6					

	Animals, including humans (Circulatory, digestive systems, diet, exercise and drugs)	Light	Living things and their habitats - Classification	Evolution and Inheritance	Electricity
Knowledge **Animals, including humans** • 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. **Living things and their habitats – classification** • Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals • Give reasons for classifying plants and animals based on specific characteristics **Evolution and Inheritance** • Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago	• Know the parts of the circulatory system and how it works • Understand what heart rate is and how it can be affected. • Know what foods are healthy and unhealthy and understand the importance of a healthy diet • Know the impacts of exercise upon the body • Describe the way some drugs impact the body. • Know the different parts of the digestive system and their functions.	• Know what light is • Know that light travels in straight lines • Know how light helps us see • Understand the terms transparent, translucent and opaque • Understand the terms reflection and refraction and the differences between them • Know that shadows form when an object blocks light. • Know this is why a shadow is the same shape as the object that formed it	• Know that Carl Linnaeus developed the classification of living things • Know that organisms can be grouped by their physical characteristics • Be able to classify living things by their characteristics • Know some of the groups – plants, animals, fungi, bacteria • Know the features of a mammal, amphibian, bird, reptile and fish. • Classify different animals into these categories. • Know the difference between vertebrates and invertebrates. • Know the difference between flowering and non-flowering plants. Name some examples.	• know how fossils are formed • Know that Charles Dawin first put forward the idea of evolution and the impact this had on the scientific community. • Know the difference between inherited and acquired characteristics in offspring. • Know that organisms adapt to their environment. • Know that these adaptations may lead to species changes over time – called evolution. • Know that evolution is when a type of organism changes over time – usually due to environmental factors. •	• Know that more cells in a circuit equals a brighter bulb or a louder buzzer. • Understand the function of a switch and how it works • Know the correct symbols to represent a circuit in a diagram – including bulb and cell

• Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents • Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution **Light** • 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 **Electricity** • Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit • Know what causes the 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.					
Cross-curricular links					
Skills • Plans different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary • Takes measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate • Records data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs • Reports and presents 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 • Uses test results to make predictions to set up further comparative and fair tests • Identifies scientific evidence that has been used to support or refute ideas or arguments	• Investigate the effects of exercise on heart rate **** • Research the effects of drugs* •	• Demonstrate refraction ** • Investigate different types of reflection ** • Investigate how a shadow changes due to the angles of the light source ***	• Conduct a 'bug hunt' in the school grounds	• Understand the impact of Darwin's ideas. • Prove that penguins huddle together to conserve their body heat. ***** •	• 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 ****