



Science Curriculum Progression

National Curriculum Aims:

SCIENCE CURRICULUM PROGRESSION – Working Scientifically

EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<p>Working Scientifically</p> <ul style="list-style-type: none"> ask questions to find out more ask 'why?' questions choose the right resources to carry out their own plan use new vocabulary talk about what they see using a wide vocabulary develop their fine motor skills so that they can use a range of tools competently, safely and confidently make comparisons between objects relating to size, length, weight and capacity write short sentences using known sound letter correspondence begin to describe a sequence of events, real or 	<p>Working Scientifically</p> <ul style="list-style-type: none"> asking simple questions and recognising that they can be answered in different ways. observing closely, using simple equipment performing simple tests identifying and classifying using their observation and ideas to suggest answers to questions gathering and recording data to help in answering questions <p>NOTES The focus in KS1 is for pupils to explore the world around them, observe, be curious and raise their own questions about what they notice. Expectations by the end of Y2 is that they should:</p> <ul style="list-style-type: none"> experience different types of scientific enquiries, including practical activities, and begin to recognise different ways to answer scientific questions. use simple features to compare objects, materials and living things, and <i>with help</i> be able to sort and group, observe changes over time, and begin to notice patterns and relationships. ask questions and use simple secondary sources to find answers. 		<p>Working Scientifically</p> <ul style="list-style-type: none"> asking relevant questions and using different types of scientific enquiry to answer them setting up simple practical enquiries, comparative and fair tests making systematic and careful observations, where appropriate taking accurate measurements using standard units, using a range of equipment (inc thermometers and data loggers) gathering, recording, classifying and presenting data in a variety of ways to help answer 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. <p>NOTES</p>		<p>Working Scientifically</p> <ul style="list-style-type: none"> planning different types of scientific enquiries to answer questions, including recognising and controlling variables. Taking measurements using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings where appropriate. Recording data and results of increasing complexity, using scientific diagrams and tables, classification keys, tables, scatter graphs, bar and line graphs. Using test results to make predictions and 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 displays and other presentations. identifying scientific evidence that has been used to support or refute ideas or arguments. <p>NOTES The principal focus in UKS2 is to develop a deeper understanding of a wide range of scientific ideas. By the end of Y6 they should be able to:</p> <ul style="list-style-type: none"> use their science experiences to raise questions and select and plan enquiries to answer them 	

<p>fictional using words such as 'first'</p> <ul style="list-style-type: none"> • articulate their ideas and thoughts in well-formed sentences <p>NOTES The focus in EYFS is for children to develop their understanding of the world around them (science knowledge) through play, using their observational skills and natural curiosity to ask questions about the world around them.</p>	<ul style="list-style-type: none"> • use simple measurements and equipment to carry out simple tests, gather and record data, and talk about their findings. <i>With help</i> record and communicate findings in a range of ways • begin to use simple scientific language. 	<p>The main objective in LKS2 is to enable pupils to broaden their scientific view of the world. By the end of Y4 they should be able to:</p> <ul style="list-style-type: none"> • make their own decisions a/bout the types of scientific enquiry likely to be the best way to answer science questions; help make decisions about the type of observations to make, how long to make them for and the equipment needed; and talk about criteria for grouping, sorting and classifying. • collect their own data and help make decisions about how to record and analyse it. • With help look for changes, patterns, similarities and differences to draw conclusions and use some scientific language to talk about and write about their findings. • recognise when and how secondary sources might help answer questions that cannot be answered through practical investigations. 	<ul style="list-style-type: none"> • make their own decisions about what observations to make, what measurements to use and how long to make them for; explain which variables need to be controlled and why; choose the most appropriate equipment to use • decide how to record data, look for different causal relationships, and identify evidence that supports or refutes ideas; identify when further tests and observations might be needed. • recognise which secondary sources will be most useful to research ideas and begin to separate opinion from fact. • use relevant scientific language and illustrations to discuss, communicate and justify scientific ideas; talk about how scientific ideas have developed over time. • read, spell and pronounce scientific vocabulary correctly.
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SCIENCE CURRICULUM PROGRESSION – Animals Including Humans

EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<p>The Natural World</p> <p>Development Matters Reception:</p> <ul style="list-style-type: none"> Explore the natural world around them Describe what they see, hear and feel whilst outside. <p>Early Learning Goal:</p> <ul style="list-style-type: none"> Explore the natural world around them, making observations and drawing pictures of animals and plants. Understand some important processes and changes in the natural world around them. <p>NOTES: Children in EYFS explore changes in the natural world by: understanding, observing and talking about the lifecycle of a duck: knowing how to care for ducklings; observing and talking about the lifecycle of a butterfly.</p> <p>Children in EYFS learn about the names of their body parts through PSHE.</p> <p>LINKS TO: Y1 Animals including Humans.</p>	<p>Animals including Humans</p> <ul style="list-style-type: none"> Identify, name and compare a variety of common animals including fish, amphibians, reptiles, birds and mammals Describe and compare the structure of a variety of common animals inc pets. Identify carnivores, herbivores and omnivores. Identify, name, draw and label basic parts of the human body and identify parts related to senses <p>NOTES: <u>PUPILS SHOULD USE THE LOCAL ENVIRONMENT THROUGHOUT THE YEAR</u> to explore and answer questions. Body parts could be learned through games, actions and songs. Work scientifically: Observations to compare and contrast. Grouping to identify. Senses might be used to compare different textures, sounds and smells</p> <p>LINKS TO: Y3 nutrition Y4 teeth of carnivores & herbivores;</p>	<p>Animals including Humans</p> <ul style="list-style-type: none"> Notice that all animals inc humans have offspring which grow into adults (basic life-cycles) Find out and describe basic survival needs (water, food, air) Describe the importance of hygiene, exercise and healthy eating <p>NOTES: Pupils should be introduced to the processes of growth and reproduction but the focus at this stage should be on questions that help pupils recognise growth, They are not expected to understand how reproduction occurs. Simple examples of life-cycles eg. egg-chick-chicken-egg; spawn-tadpole-frog; baby-toddler-child-teenager-adult. Work scientifically by observing and measuring growth; asking questions and suggesting ways to find answers to questions.</p> <p>LINKS TO: Y3 nutrition, food groups & healthy eating; Y5 gestation & growth; Y5 life-cycles (Living Things & Habitats); Y2 PSHE</p>	<p>Animals including Humans</p> <ul style="list-style-type: none"> Identify that animals inc humans need the right type of nutrition; we cannot make our own food but get nutrition from what we eat. Identify that humans and some animals have skeletons and muscles for support, protection and movement. <p>NOTES: Build on work from Y1 on carnivores & herbivores; and in Y2 on nutrition. Compare and contrast diets of different animals and group accordingly. Research different food groups and design healthy meals. Pupils should be introduced to the main body parts associated with skeleton and muscles; understand that parts of the body have special functions; identify and group animals with and without skeletons; observe and compare their movements; explore ideas eg. what if humans didn't have skeletons?</p> <p>LINKS TO: Y4 teeth & digestion system</p>	<p>Animals including Humans</p> <ul style="list-style-type: none"> Identify different types of teeth and their simple functions Describe simple functions of basic parts of the digestive system Construct and interpret a variety of food chains, identifying producers, predators and prey. <p>NOTES: Main body parts of the digestion system: mouth; tongue; teeth; oesophagus; stomach; and intestine. Explore questions that help understand special functions.</p> <p>Build on work from Y1&3 by comparing teeth of carnivores and herbivores, suggesting reasons for differences; find out what damages teeth and how to look after them. They might discuss and draw their ideas about the digestive system and then compare their ideas with models/images. They are not expected to understand the processes of digestion at this stage.</p> <p>LINKS TO: Y6 blood & circulation system</p>	<p>Animals including Humans</p> <ul style="list-style-type: none"> Describe the changes as humans develop to old age. <p>NOTES: Pupils should be able to draw a timeline to indicate the stages of growth at different stages of development. They should learn about changes at puberty. They might work scientifically by researching gestation periods of other animals and compare them to humans; they might find out and record the length and mass of a baby as it grows.</p> <p>LINKS TO: Y6 Evolution & inheritance Y5&Y6 SRE Y5/6 MATHS</p>	<p>Animals including Humans</p> <ul style="list-style-type: none"> Identify the main parts of the human circulatory system; describe the functions of the heart, blood vessels and blood Describe the ways nutrients and water are transported within animals inc humans Recognise the impact of diet, exercise, drugs and lifestyle on the body. <p>NOTES: Build on work from Y3&4 about the main body parts and internal organs. Explore and answer questions that help them understand how the circulatory system enables the body to function; how to stay healthy; how bodies can be damaged through drugs and harmful substances. They might work scientifically by exploring the work of scientists on the relationship between diet, exercise, drugs, lifestyle and health</p> <p>LINKS TO: Y5 & Y6 PHSE/SRE</p>

SCIENCE CURRICULUM PROGRESSION – Living Things and their Habitats

EYFS	Year 1	Year 2	Year 4	Year 5	Year 6
<p>The Natural World Development Matters Reception:</p> <ul style="list-style-type: none"> Explore the natural world around them Describe what they see, hear and feel whilst outside. Understand the effect of changing seasons on the natural world around them. <p>Early Learning Goal:</p> <ul style="list-style-type: none"> Explore the natural world around them, making observations and drawing pictures of animals and plants. Understand some important processes and changes in the natural world around them, including the seasons. <p>NOTES: Children make observations during forest school and outside play. Children recognise the signs of different seasons.</p>	<p>Seasonal Changes</p> <ul style="list-style-type: none"> Observe changes across the four seasons. Observe and describe weather associated with the seasons Observe and describe how day length varies across the seasons <p>NOTES: <u>TO BE TAUGHT THROUGHOUT THE YEAR</u> Pupils should observe and talk about changes in the weather and the seasons. Pupils might work scientifically by making tables and charts about the weather; making displays of the world around them. Pupils should be warned not to look directly at the sun even with dark glasses.</p> <p>LINKS TO: → Y2 local environments; Y4 changing environments</p>	<p>Living Things and Their Habitats</p> <ul style="list-style-type: none"> Explore and compare the difference between things living, dead and never alive. Identify that most living things need habitats to which they are suited and which provide for basic needs, and how these animals depend on each other. Identify and name a variety of plants and animals in their habitats inc micro-habitats Describe how animals obtain food from plants and other animals; identify and name sources of food <p>NOTES: Pupils should be introduced to the idea that some life processes are common to all living things; identify and study a range of plants and animals in the local environment and observe inter-dependency; Know the terms ‘habitat’ and ‘micro-habitat’ and compare animals in familiar habitats with less familiar habitats. Pupils might work scientifically by sorting and classifying things according to whether alive, dead or never alive, recording their findings using charts They should describe how they decided what to put where. Construct <u>simple</u> food chains such as grass-cow-human. Describe and compare the conditions in different habitats and micro-habitats and find out how the conditions affect the number and type(s) of plants and animals that live there.</p>	<p>Living Things and Their Habitats</p> <ul style="list-style-type: none"> Recognise that living things can be grouped in a variety of ways. Explore and use classification keys to group, identify and name a variety of living things in local and wider environments. Recognise that environments can change which might pose a threat to living things. <p>NOTES: <u>PUPILS SHOULD USE THE LOCAL ENVIRONMENT THROUGHOUT THE YEAR</u> ← Build on Y2 to identify plants and animals in their habitat and identify how habitats change throughout the year. Explore possible ways of grouping a wide variety of living things: group vertebrate animals into fish, amphibians; reptiles, birds and mammals; invertebrates into snails and slugs, worms, spiders and insects; plants into flowering plants (inc grasses) and non-flowering plants (eg ferns and mosses). Explore examples of human impact on environments (positive and negative) Work scientifically by: using and making simple guides or keys to local plants and animals.</p> <p>LINKS TO: → Y6 Classification; Y5 geography on conservation</p>	<p>Living Things and Their Habitats</p> <ul style="list-style-type: none"> Describe the differences in the life-cycles of a mammal, an amphibian, an insect and a bird Describe the life processes of reproduction in some plants and animals <p>NOTES: <u>PUPILS SHOULD USE THE LOCAL ENVIRONMENT THROUGHOUT THE YEAR</u> ← Build on Y2 directly observing life-cycle changes in a variety of living things (eg. vegetable garden, chicks, tadpoles) Find out about the work of naturalists & animal behaviourists such as David Attenborough and Jane Goodall. Find out about different types of reproduction including sexual and asexual reproduction in plants and sexual reproduction in animals Work scientifically by comparing life cycles of local living things with others from around the world and other times (eg pre-historic); Grow new plants from seeds, stem and root cuttings, tubers and bulbs. Observe the hatching and rearing of chicks.</p> <p>LINKS TO: → Y6 Evolution & inheritance Y5/6 SRE</p>	<p>Living Things and Their Habitats</p> <ul style="list-style-type: none"> Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences (inc micro-organisms, plants and animals) Give reasons for classifying plants and animals based on specific characteristics. <p>NOTES: ← Build on learning from Y4 by looking at the classification system in more detail understanding that broad groups can be subdivided. Classify animals by direct observation where possible. Learn about the work on classification by Carl Linnaeus. Work scientifically by using classification systems and keys to identify some plants and animals in the local environment; research unfamiliar plants/animals and decide where they belong in the classification system.</p> <p>LINKS TO: → Y6 Evolution & inheritance</p>

Children make observations and drawing pictures of animals and plants

LINKS TO: Y1 Seasonal Changes

LINKS TO: Y4 changing environments; Y4 food chains (Animals inc humans)

SCIENCE CURRICULUM PROGRESSION – Plants

EYFS	Year 1	Year 2	Year 3
<p>The Natural World</p> <p>Development Matters Reception:</p> <ul style="list-style-type: none"> • Explore the natural world around them • Describe what they see, hear and feel whilst outside. • Understand the effect of changing seasons on the natural world around them. <p>Early Learning Goal:</p> <ul style="list-style-type: none"> • Explore the natural world around them, making observations and drawing pictures of animals and plants. • Understand some important processes and changes in the natural world around them, including the seasons. <p>NOTES: Children make observations during forest school and through outside play. Children plant and grow a seed in a glass jar enabling them to see the germination of the bean and care for it (water/sunlight) to facilitate its growth. Children understand the lifecycle of a plant.</p> <p>LINKS TO: → Y1 Seasonal Changes</p>	<p>Plants</p> <ul style="list-style-type: none"> • Identify and name a variety of common wild and garden plants including deciduous and evergreen trees. • Identify and describe the basic structure of a variety of common flowering plants including trees. <p>NOTES: <u>PUPILS SHOULD USE THE LOCAL ENVIRONMENT THROUGHOUT THE YEAR</u> to explore and answer questions about plants growing in their habitat. Observe growth of flowers and vegetables they have planted. They should become familiar with common names of flowers, trees. Learn about plant structures: leaves, flowers (blossom), petals, fruit, roots, bulb, seed, trunk, branches, stem</p> <p>LINKS TO: → Y3 parts of flowering plants;</p>	<p>Plants</p> <ul style="list-style-type: none"> • Observe and describe how seeds and bulbs grow into mature plants • Find out and describe how plants need water, light and a suitable temperature to stay healthy <p>NOTES: <u>PUPILS SHOULD USE THE LOCAL ENVIRONMENT THROUGHOUT THE YEAR</u> to observe how different plants grow. Introduced to the requirements of plants for: germination, growth and survival, and to the processes of reproduction Seeds and bulbs need water to grow but do not need light; seeds and bulbs have food stores inside them. Work scientifically by observing, measuring and recording growth of a variety of plants; setting up comparative tests to show plants need water/light to stay healthy.</p> <p>LINKS TO: → Y3 requirements for life & growth; Y3 animals need food (Animals inc Humans)</p>	<p>Plants</p> <ul style="list-style-type: none"> • Identify and describe the <u>functions</u> of different parts of flowering plants: roots, stem/trunk, leaves, flowers. • Explore the part that flowers play in the life-cycle of flowering plants including: pollination, seed formation, and seed dispersal • Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, room to grow) and how they vary from plant to plant. • Investigate how water is transported within plants. <p>NOTES: Build on work in Y1 to understand the relationship between structure and function; understand that every part has a job to do; focus on the role of roots & stem in nutrition and support; leaves for nutrition; flowers for reproduction. Build on Y2 work on requirements for growth and health Can be introduced to the idea that plants make their own food but at this stage do <u>not</u> need to understand how.</p> <p>Work scientifically by: Comparing the effect of different factors on plant growth; Discovering how seeds are formed by watching different stages of plant life-cycle; looking for the patterns in the structure of fruits that relate to seed dispersal; observe how water is transported in plants by observing coloured water travelling up stems to flowers</p> <p>LINKS TO: → Y5 plant and animal reproduction (Living Things & Habitats)</p>

SCIENCE CURRICULUM PROGRESSION – Materials and States of Matter

EYFS	Year 1	Year 2	Year 3	Year 4	Year 5
<p>The Natural World</p> <p>Development Matters Reception:</p> <ul style="list-style-type: none"> Explore the natural world around them Describe what they see, hear and feel whilst outside. Understand the effect of changing seasons on the natural world around them. <p>Early Learning Goal:</p> <ul style="list-style-type: none"> Explore the natural world around them, making observations and drawing pictures of animals and plants. Understand some important processes and changes in the natural world around them, including the seasons and changing state of matter. <p>NOTES: Children explore ice / observing and melting. Adults support using effective question prompts: What can you see? What does it remind you of? What do you think will happen next? How can we change this? What do you already know about...? What is the same/different? I wonder why... I wonder when... I wonder how... I wonder what... What would happen if...?</p> <p>LINKS TO: Y1 Everyday Materials</p>	<p>Everyday Materials</p> <ul style="list-style-type: none"> Distinguish between an object and the material it is made from. Identify and name a variety of materials including wood, plastic, glass, metal, water, rock Describe simple physical properties of a variety of everyday materials Compare and group together everyday materials on the basis of simple physical properties <p>NOTES: Explore, name, discuss and raise and answer questions so they become familiar with names of materials and properties such as: hard/soft; stretchy/stiff; shiny/dull; rough/smooth; opaque/transparent; bendy; waterproof; absorbent. Pupils should study a wide range of materials not just those in the statement. Perform simple tests to determine the best material for an object/task eg. umbrella</p> <p>LINKS TO: Y2 Uses of materials</p>	<p>Uses of Everyday Materials</p> <ul style="list-style-type: none"> Identify and compare the uses of a variety of everyday materials including wood, metal, plastic, glass, rock, brick, paper, cardboard Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. <p>NOTES: Identify and discuss uses of materials so they know that some materials can be used for more than one purpose/object. Discuss the properties that make them un/suitable for particular purposes. Imagine unusual or creative uses for everyday materials – learn about people who have developed NEW materials eg John Dunlop, Charles Macintosh, John McAdam, Stephanie Kwoelek</p> <p>Work scientifically by comparing uses of materials; observing, classifying and recording findings.</p> <p>LINKS TO: Y3 comparing & classifying rocks Y5 properties of materials Y4 classification (Living Things & Habitats)</p>	<p>Rocks and Soils</p> <ul style="list-style-type: none"> Compare and group different kinds of rocks in the basis of appearance and simple properties. Recognise that soils are made from rocks and organic matter Describe in simple terms how fossils are formed when that have lived are trapped within rock <p>NOTES: Link with work on geography to explore different kinds of rocks and soils including in local environment</p> <p>Work scientifically by: observing rocks inc those in buildings and gravestones, exploring how and why they might have changed over time; using a hand lens or microscope to identify and classify rocks according to whether they have grains or crystals; research different things whose fossils are found in sedimentary rock; explore and investigate different kinds of soil and their similarities & differences.</p> <p>LINKS TO: Y6 Evolution & Inheritance KS2 physical geography</p>	<p>States of Matter</p> <ul style="list-style-type: none"> Compare and group materials together depending on 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 °C. Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. <p>NOTES: Explore a wide range of everyday materials and develop simple definitions/descriptions of the states of matter. Observe water in all three of its forms and note the changes when heated/cooled. Teachers should avoid using materials where heating results in a chemical change eg baking</p> <p>Work scientifically by: grouping and classifying a variety of materials; exploring the effect of temperature on substances such as chocolate, butter cream (eg crispie cakes/ice-cream); research the temperature at which different materials change state; observe and record evaporation over a period of time; investigate the effect of temperature on washing drying or snowmen melting</p>	<p>Properties of Materials</p> <ul style="list-style-type: none"> Compare and group materials on the basis of their properties including: hardness, solubility, transparency, electrical and thermal conductivity, and responses to magnets. Give reasons based on evidence from comparative and fair tests for particular uses of materials inc metal, wood, plastic Know that some solids will dissolve to form solutions, and describe how to recover substances from solution. Use knowledge of solids, liquids and gases to decide how mixtures might be separated: filtering, sieving, evaporating. 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 is usually not reversible inc burning, acid/bicarb <p>NOTES: Build a more systematic understanding of materials in relating learning from Y3&4 on magnetism and electricity. Recognise that melting and dissolving are different processes. Explore materials scientists such as Spencer Silver and Ruth Benerito.</p>

LINKS TO: Y5 reversible/
irreversible changes
KS2 geography: water cycle

NOT expected to make quantitative measurements about conductivity and insulation at this stage but they should note that some conductors produce a brighter bulb than others and some materials will be hotter.

Work scientifically by: **carrying out tests** to answer questions such as 'Which materials would be most effective for making a warm jacket/wrapping ice-cream/ making blackout curtains.; **compare** materials to make a switch in a circuit; observe and compare changes taking place when baking bread or cakes; research and **discuss the impact** of chemical changes on our lives eg new materials such as polymers, super sticky or super thin materials.

SCIENCE CURRICULUM PROGRESSION – Light & Sound

Year 3	Year 4	Year 6
<p>Light</p> <ul style="list-style-type: none"> • Recognise we need light in order to see things and darkness is an 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 our eyes • Recognise that shadows are formed when light is blocked by a opaque object. • Find patterns in the way that the size of shadows change <p>NOTES: Explore what happens when light reflects off a mirror and other reflective surfaces, including playing mirror games to help answer questions about how light behaves. Look for and measure shadows; find out how they are formed and what might cause shadows to change. They should think about why it is important to protect our eyes from bright lights. Pupils should be warned not to look directly at the sun even with dark glasses. Work scientifically by looking for patterns in what happens to shadows when the light source moves or the distance between the light source and the object changes.</p> <p>LINKS TO → Y6 Light Y6 Earth and Space (shadow clocks and sun dials)</p>	<p>Sound</p> <ul style="list-style-type: none"> • Identify how sounds are made, associating some of them with something vibrating • Recognise that vibrations from sounds travel through a medium (air, earth, water) 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 vibrations that produced it. • Recognise that sounds get fainter as the distance from the source is increased. <p>NOTES: Explore and identify the way sound is made through vibration in a wide range of different instruments from around the world. Find out how pitch and volume of sounds can be changed in a variety of ways. Work scientifically by: Finding patterns in sounds made by different objects eg. saucepan lids of different sizes or elastic bands of different thicknesses; Make earmuffs from different materials to investigate which provide best insulation against sound; Make and play own instruments using what they have learned about pitch and volume.</p> <p>LINKS TO: → Y5 Properties of materials KS2 Music; DT; Geography</p>	<p>Light</p> <ul style="list-style-type: none"> • Recognise that light appears to travel in straight lines. • Explain that we see things because light travels from light sources to our eyes or from light sources to objects then to our eyes • 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 • Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. <p>NOTES: Build on learning from Y3 exploring the way that light behaves, including light sources, reflection and shadows. They should talk about what happens and make predictions. They might work scientifically by: Deciding where to place rearview mirrors on cars; designing and making periscopes and explaining how it works. Investigate the relationship between light sources, objects and shadows by making and using shadow puppets. Observe range of phenomena such as rainbows, colours on soap bubbles, objects looking bent in water and coloured filters – they do not need to explain these phenomena</p> <p>LINKS TO: → DT; Maths: angles, measurement</p>

SCIENCE CURRICULUM PROGRESSION – Forces, Magnets and Electricity

Year 3	Year 4	Year 5	Year 6
<p>Forces and Magnets</p> <ul style="list-style-type: none"> • 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 but not others. • Compare and group 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. <p>NOTES: Observe that magnetic forces can act without direct contact and note that this is different to most forces. Explore the behaviour and everyday uses of different magnets. Work scientifically by: Comparing how different things move and grouping them; carry out tests how far things move on different surfaces, gathering and recording data to answer questions. Exploring strengths of different magnets and finding a fair way to compare them; sorting materials that are magnetic or not; looking for patterns in the way magnets behave and considering what might cause this; identifying how magnets are useful in everyday life and suggesting creative uses.</p> <p>LINKS TO: Y5 Forces: friction Y5 Properties of Materials</p>	<p>Electricity</p> <ul style="list-style-type: none"> • Identify common appliances that run on electricity • Construct a simple series circuit, identifying and naming basic parts: cells, wires, bulbs, switches, 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 common conductors and insulators and associate metals with being good conductors. <p>NOTES: Construct simple series circuits, trying different components such as bulbs, buzzers and motors and including switches. Use circuits to create simple devices. Pupils should draw circuits using pictorial representations at this stage; circuit symbols will be introduced in Y5 Pupils might use the terms current and voltage but these should not be introduced or defined formally at this stage. Work scientifically observing patterns: eg. bulbs get brighter if more cells are added; that metals tend to be conductors; that some materials cannot be used to connect across a gap in the circuit.</p> <p>LINKS TO: Y6 Electricity Y5 Properties of Materials</p>	<p>Forces</p> <ul style="list-style-type: none"> • Explain that unsupported objects fall towards 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. <p>NOTES: Explore falling objects and raise questions about the effects of air-resistance. Experience forces that make things begin to move, go faster and slow down. Building on work from Y3, explore the effects of friction on movement and find out how it slows or stops moving objects. Explore the effects of lever, pulleys and simple machines. Find out about scientists such as Galileo Galilei and Isaac Newton. Work scientifically by: exploring falling paper cones or cake cases and designing and making parachutes, carrying out fair tests to determine the most effective designs; exploring resistance in water by making and testing boats of different shapes; design and make artefacts using simple levers, pulley, gears and/or springs and explore their effects.</p> <p>LINKS TO: KS2 DT KS2 Maths: weight and mass</p>	<p>Electricity</p> <ul style="list-style-type: none"> • Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells 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. <p>NOTES: Build on learning from Y4, construct simple series circuits to help them answer questions when they add or vary different components. Represent a simple circuit in a diagram using recognised symbols. Work scientifically by: Systematically identifying the effect of changing one component at a time in a circuit Designing and making a set of traffic lights, a burglar alarm or some other useful circuit. Pupils are expected to learn only about series circuits, not parallel circuits.</p> <p>LINKS TO: KS2 DT</p>

