

# Science Progression Map





## Working Scientifically Skills Progression: KEY STAGE 1

	To ask scientific questions	To plan an enquiry	To observe closely	To take measurements	To gather and record results	To present results	To interpret results	To draw conclusions	To make a prediction	To evaluate an enquiry	
<b>Classification</b>	Be able to ask yes/no questions to aid sorting	Identify the headings for the two groups (it is..., it is not...)	Be able to compare objects, based on obvious features e.g. size, shape, colour			Sort objects and living things into two groups using a basic Venn diagram or simple table.	Talk about the number of objects in each group i.e. which has more or less.	Children in KS1 are not expected to draw conclusions. They are expected to make observations which will help them answer questions. They do not have the subject knowledge yet to give reasons for what they observe so they cannot draw scientific conclusions.	Children in KS1 are not expected to make scientific predictions as they do not have the subject knowledge to do this. That does not mean that you should not ask children what they think may happen, but this will be based on experience or may simply be a guess.	Children in KS1 are not expected to evaluate. However, children should be encouraged to consider their method (what they did) and adapt this where necessary.	
<b>Research</b>	Ask one or two simple questions linked to a topic.					Present what they have learnt verbally or using pictures.	Be able to answer their questions using simple sentences.				
<b>Comparative / fair testing</b>	Identify the question to investigate from a scenario or choose a question from a range provided.	Choose equipment to use and decide what to do and what to observe or measure to answer a question.	Make observations linked to answering the question.	Measure using standard units, when appropriate, where all the numbers are marked on the scale.	Record data in simple prepared tables, pictorially or by taking photographs.	Present what they learnt verbally, using pictures or block diagrams.	Answer their question in simple sentences using their observations or measurements.				
<b>Observation over time</b>	Ask a question about what might happen in the future based on an observation.										
<b>Pattern seeking</b>	Ask a question that is looking for a pattern based on observations.									Record data in simple, prepared tables and tally charts.	Present what they learnt verbally.



## Working Scientifically Skills Progression: LOWER KEY STAGE 2

	To ask scientific questions	To plan an enquiry	To observe closely	To take measurements	To gather and record results	To present results	To interpret results	To draw conclusions	To make a prediction	To evaluate an enquiry
<b>Classification</b>	Be able to ask a yes / no question to aid sorting.	Be able to put appropriate headings into intersecting Venn and Carroll diagrams.	Be able to compare objects based on more sophisticated, observable features. Present observations in labelled diagrams.			Sort objects and living things into groups using intersecting Venn diagrams and Carroll diagrams.	Spot patterns in the data particularly two criteria with no examples.	Draw simple conclusions, when appropriate, for patterns.		Suggest improvements . Suggest new questions arising from the investigation.
<b>Research</b>	Ask a range of questions linked to a topic.	Choose a source from a range provided.				Present what they learnt verbally or using labelled diagrams.	Be able to answer their questions using simple scientific language.			Suggest limitations. Suggest new questions arising from the investigation.
<b>Comparative / fair testing</b>		Decide what to change and what to measure / observe.	Make observations linked to answering the question.	Measure using standard units where not all the numbers are marked on the scale. Take repeat readings if needed.	Prepare own tables to record data.	Present data in bar charts.	Refer directly to their evidence when answering their question.	Where appropriate provide oral or written explanations for their findings.	Use results from an investigation to make a prediction about a further result.	Suggest improvements e.g. to method of taking measurements. Suggest new questions arising from the investigation.
<b>Observation over time</b>		Decide what to measure / observe. Decide how often to take measurements.	Make a range of relevant observations.	As above. Use dataloggers to measure over time.		Present data in time graphs.				
<b>Pattern seeking</b>		Decide what to measure or observe.	Make observations linked to answering the question.	Measure using standard units where not all the numbers are marked on the scale.		Use ICT package to present data as a scattergram.				



## Working Scientifically Skills Progression: UPPER KEY STAGE 2

	To ask scientific questions	To plan an enquiry	To observe closely	To take measurements	To gather and record results	To present results	To interpret results	To draw conclusions	To make a prediction	To evaluate an enquiry
<b>Classification</b>	Be able to ask a range of questions to aid sorting and decide which ways of sorting will give useful information.	Identify specific clear questions that will help to sort without ambiguity.	Be able to compare not only based on physical properties but also on knowledge gained through previous enquiry.			Use and create branching databases and keys to enable others to name living things and objects	Be able to talk about the features that objects and living things share and do not share based on information from keys etc.	Be able to use data to show that living things and materials that are grouped together have more things in common than with things in other groups.		Be able to explain using evidence that the branching database or key will only work for the living things or materials it was created for.
<b>Research</b>	Ask a range of questions recognising that some can be answered through research and others may not.	Choose suitable sources to use. Use a range of sources.				Present what they learnt in a range of ways e.g. different graphic organisers.	Be able to answer questions using scientific evidence gained from a range of sources.			Be able to talk about their degree of trust in the sources they used.
<b>Comparative / fair testing</b>	Ask a range of questions and identify the type of enquiry that will help to answer the questions. Ask further questions based on results and research.	Recognise and control variables where necessary.	Make observations linked to answering the question.	Measure using standard units using equipment that has scales involving decimals.	Prepare own tables to record data including columns for repeated results.	Choose an appropriate form of presentation, including line graphs.	Be able to answer their questions, describing casual relationships.	Provide oral or written explanations for their findings.	Use test results to make predictions for further investigation	Explain their degree of trust in their results e.g. precision in taking measurement, variables that may not have been controlled and accuracy of results.
<b>Observation over time</b>			Make a range of relevant observations.		Prepare own tables to record data.		Be able to answer their questions describing the change over time.			
<b>Pattern seeking</b>			Make observations linked to answering the question.		As above- including scatter graphs.		Be able to answer their questions, identifying patterns			



Progression in Substantive Knowledge - Biology							
	Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<b>Living Things and Habitats</b>	ELG 15a: Explore the natural world around them, making observations and drawing pictures of animals and plants	<p><b>Taking Care of The Earth (CKS)</b> Understand that some natural resources are limited</p> <p>Learn practical measures for conserving energy and resources</p> <p>Understand that some materials can be recycled</p> <p>Understand that pollution (for example, littering, smog, water pollution) can be harmful</p> <p>Understand how to help reduce pollution</p>	<p><b>Living Things and Their Habitats (NC)</b></p> <p>Explore and compare the differences between things that are living, dead, and things that have never been alive</p> <p>Identify that most living things live in habitats to which they are suited and describe how habitats provide for the basic needs of animals and plants, and how they depend on each other</p> <p>Identify and name a variety of plants and animals in their habitats (including micro-habitats) such as forests, meadows &amp; plains, underground, deserts and water</p> <p>Understand oceans and undersea Life</p> <p>Describe how animals obtain their food from plants and other animals using a simple food chain, and identify and name different sources of food</p>	<p><b>Insects (CKS)</b></p> <p>Understand ways that insects can be helpful, such as: <b>pollination; products like honey, beeswax, and silk; and eating harmful insects</b></p> <p>Understand ways that insects can harmful such as: <b>destroying crops, trees, wooden buildings, clothes; carrying disease; and biting or stinging</b></p> <p>Distinguish key characteristics such as: the exoskeleton, the chitin, the six legs and three body parts: head, thorax and abdomen; and wings</p> <p>Understand the life cycles of some insects, including metamorphosis</p> <p>Understand the behaviour of some social Insects</p>	<p><b>Living Things and Their Habitats (NC)</b></p> <p>Recognise that living things can be grouped in a variety of ways</p> <p>Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment</p> <p>Become familiar with and recognise basic characteristics of: fish, amphibians, reptiles, birds and mammals</p> <p>Recognise that environments can change and that this can sometimes pose dangers to living things</p> <p>Understand how ecosystems can be affected by changes in environment (for example, rainfall, food supply, etc.) and by man-made changes</p> <p>Understand man-made effects of the environment</p>	<p><b>Living Things and Their Habitats (NC)</b></p> <p>Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird</p> <p>Describe the life process of reproduction in some plants and animals</p> <p>Understand the growth stages of a human: embryo, foetus, new-born, infancy, childhood, adolescence, adulthood, old age</p> <p>Understand external fertilisation of some animals</p> <p>Understand internal fertilisation of some animals (e.g. birds and mammals)</p> <p>Understand development of an embryo - egg, zygote, embryo, growth in uterus, foetus, new-born</p>	<p><b>Living Things and Their Habitats (NC)</b></p> <p>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</p> <p>Give reasons for classifying plants and animals based on specific characteristics</p> <p>Understand basic taxonomy</p> <p>Understand different classes of vertebrates and major characteristics (review of Y4)</p> <p>Understand basic cell structure</p> <p>Understand the differences between animal &amp; plant cells</p>



Progression in Substantive Knowledge - Biology							
	Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<b>Plants</b>	<p>ELG 15a: Explore the natural world around them, making observations and drawing pictures of animals and plants</p>	<p><b>Plants (NC)</b> Identify and name a variety of common wild and garden plants, including deciduous/evergreen trees</p> <p>Describe the basic structure of common flowering plants, including trees - seed, root, stem, branch, leaf flower</p>	<p><b>Plants (NC)</b> Observe and describe how seeds and bulbs grow into mature plants</p> <p>Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy</p>	<p><b>Plants (NC)</b> Identify and describe functions of parts of flowering plants</p> <p>Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, room to grow) and how they vary between plants <i>(revision of year 2 but in depth)</i></p> <p>Investigate how water is transported within plants</p> <p>Explore the life cycle of flowering plants, including pollination, seed formation and seed dispersal</p>			



Progression in Substantive Knowledge - Biology							
	Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<b>Animals</b>	<p>ELG 15a: Explore the natural world around them, making observations and drawing pictures of animals and plants</p>	<p><b><u>Animals, Including Humans (NC)</u></b> Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals</p> <p>Identify and name a variety of common animals that are carnivores, herbivores and omnivores</p> <p>Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)</p> <p>Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense</p>	<p><b><u>Animals, Including Humans (NC)</u></b> Find out about and describe the basic needs of animals, including humans, for survival (water, food and air)</p> <p>Notice that animals, including humans, have offspring which grow into adults</p> <p><b>Understand that offspring are very much (but not exactly) like their parents</b></p> <p><b>Understand that most animal babies need to be fed and cared for by their parents, especially human babies</b></p> <p><b>Recognise that pets have special needs and must be cared for</b></p> <p>Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene</p>	<p><b><u>Animals, Including Humans (NC)</u></b> Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food, they get nutrition from what they eat</p> <p>Identify that humans and some other animals have skeletons and muscles for support, protection and movement</p> <p><b>Understand that germs can cause diseases and how to prevent illness, by taking care of your body and having vaccinations</b></p>	<p><b><u>Animals, Including Humans (NC)</u></b> Describe the simple functions of the basic parts of the digestive system in humans</p> <p><b>Describe the functions and parts of the excretion system in humans</b></p> <p>Identify the different types of teeth in humans and functions</p> <p><b>Understand how to take care of your body with a healthy diet, including the 'food pyramid', vitamins and minerals</b></p> <p>Construct and interpret a variety of food chains, identifying producers, predators and prey</p> <p><b><u>The Human Body: Systems, Vision and Hearing (CKS)</u></b> <b>Understand how the eye works</b></p> <p><b>Name parts of the eye: cornea, iris and pupil, lens, retina, optic nerve</b></p> <p><b>Understand far-sightedness and near-sightedness</b></p> <p><b>Understand how the ear works</b></p> <p><b>Name parts of the ear</b></p>	<p><b><u>Animals, Including Humans (NC)</u></b> <i>(taught as part of Living Things and Their Habitats Year 5 above)</i></p> <p>Describe the changes as humans develop to old age</p>	<p><b><u>Animals, Including Humans (NC)</u></b> Identify and name the main parts of the human circulatory system and describe the functions of the heart, blood vessels and blood</p> <p><b>Understand the basic workings of the respiratory system</b></p> <p>Recognise the impact of diet, exercise, drugs and lifestyle on the way bodies function</p> <p>Describe the ways that nutrients/water are transported within humans (revision of year 4)</p> <p><b><u>Evolution and Inheritance (NC)</u></b> Recognise that living things have changed over time and that fossils provide info about living things that inhabited Earth millions of years ago</p> <p>Recognise that living things produce offspring of the same kind but they vary and aren't identical to parents</p> <p>Identify how animals and plants are adapted to suit their environment in different ways and that this leads to evolution</p>



Progression in Substantive Knowledge - Chemistry							
	Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<b>Matter</b>	<p>ELG 15c: Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter</p>	<p><b>Everyday Materials (NC)</b> Distinguish between an object and the material from which it is made</p> <p>Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock.</p> <p>Describe the simple physical properties of a variety of everyday materials</p> <p>Compare and group together a variety of everyday materials on the basis of their simple physical properties</p>	<p><b>Uses of Everyday Materials (NC)</b> Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.</p> <p>Compare how things move on different surfaces.</p> <p>Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching</p>	<p><b>Rocks (NC)</b> Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties</p> <p>Describe in simple terms how fossils are formed when things that have lived are trapped within rock</p> <p>Recognise that soils are made from rocks and organic matter</p>	<p><b>States of Matter (NC)</b> Compare and group materials together according to whether they are solids, liquids or gases</p> <p>Observe that some materials change state when heated or cooled, and measure or research the temperature at which this happens in degrees Celsius</p> <p>Identify the part played by evaporation and condensation in the water cycle: associate the rate of evaporation with temperature</p>	<p><b>Properties and Changes of Materials (NC)</b> Compare and group together everyday materials on the basis of their properties</p> <p>Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution (solute/solvent)</p> <p>Use knowledge of solids, liquids and gases to decide how mixtures might be separated</p> <p>Give reasons for the particular uses of everyday materials, including metals, wood and plastic</p> <p>Demonstrate that dissolving, mixing and changes of state are reversible changes</p> <p>Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible</p> <p><b>Geology (CKS)</b> Name the Earth's layers: crust, mantle, core (outer core and inner core)</p> <p>Understand movement of tectonic plates (earthquakes, Tsunamis and volcanoes)</p> <p>Understand basic volcanology: active, dormant, extinct volcanoes</p> <p>Understand basic theories of how the continents &amp; oceans were formed, mountain/rock formation</p>	<p><b>Chemistry: Matter and Change (CKS)</b> Understand the basics of atomic structure: nucleus, protons (positive charge), neutrons (neutral), electrons (negative charge)</p> <p>Understand that atoms are constantly in motion: electrons move around the nucleus in paths called shells (or energy levels)</p> <p>Understand that atoms may join together to form molecules or compounds</p> <p>Name common compounds and their formulas</p> <p>Know that elements have atoms of only one kind</p> <p>Understand the organisation of the periodic table</p> <p>Name some well-known elements and their symbols</p> <p>Understand there are two important categories of elements: metals and non-metals</p> <p>Understand properties of metals: most are shiny, ductile, malleable, conductive</p>





Progression in Substantive Knowledge - Physics							
	Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Light				<p><b>Light (NC)</b> Recognise that we need light in order to see things and that dark is the absence of light</p> <p>To know that light travels at an amazingly high speed and in straight lines</p> <p>Notice that light is reflected from surfaces</p> <p>Recognise that sun rays can be dangerous and that there are ways to protect eyes</p> <p>Identify transparent and opaque objects</p> <p>Recognise that shadows are formed when the light from a light source is blocked by an opaque object</p> <p>Find patterns in the way that the size of shadows change</p>			<p><b>Light (NC)</b> Recognise that light appears to travel in straight lines (revision)</p> <p>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</p> <p>Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then eyes</p> <p>Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.</p> <p>Understand mirrors: plane/concave/convex</p> <p>Understand use of mirrors in telescopes/microscopes</p>
Sound					<p><b>Sound (NC)</b> Identify how sounds are made, associating some of them with vibration</p> <p>Recognise that vibrations from sounds travel through a medium to the ear, and that sound waves are slower than light waves</p> <p>Find patterns between the pitch of sounds &amp; features of the object/speed of vibration</p> <p>Find patterns between the volume of a sound and the strength of the vibrations that produced it</p> <p>Recognise that sounds get fainter as distance from source increases</p>		



Progression in Substantive Knowledge - Physics							
	Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<b>Forces</b>	<p>ELG 15c: Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter</p>	<p><b>Introduction to Magnetism (CKS)</b>                      Identify familiar everyday uses of magnets (for example, in toys, in cabinet locks, in refrigerator magnets, etc.)</p> <p>Metals are attracted to magnets and non-metal are not.</p>		<p><b>Forces and Magnets (NC)</b>                      Compare how things move on different surfaces</p> <p>Notice that some forces need contact between two objects, but magnetic forces act at a distance</p> <p>Observe how magnets attract or repel each other and attract some materials and not others</p> <p>Group everyday materials on the basis of whether they are attracted to a magnet, and identify magnetic materials (revision)</p> <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>Discuss our magnetic field</p> <p>Understand that the Earth behaves like a huge magnet</p> <p>Understand basic use of a magnetised needle in a compass, which always point to the north</p>		<p><b>Forces (NC)</b>                      Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object</p> <p>Identify the effects of air resistance, water resistance and friction, that act between moving surfaces</p> <p>Recognise that some mechanisms, including levers, pulleys, gears, inclined planes, wedges and screws allow a smaller force to have a greater effect</p> <p>Understand how a gear works and some of its common uses</p>	



Progression in Substantive Knowledge - Physics							
	Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Electricity			<p><b>Electricity (CKS)</b> Name basic parts of simple electric circuits (for example, batteries, wire, bulb or buzzer, switch)</p> <p>Name conductive and nonconductive materials</p> <p>Understand safety rules for electricity</p>		<p><b>Electricity (NC)</b> Identify common appliances that run on electricity</p> <p>Make simple series circuit - cells, wires, bulbs, switches and buzzers</p> <p>Identify if a lamp will light in a simple circuit, based on being part of a complete loop with a battery</p> <p>Recognise that a switch opens/closes a circuit and associate this with whether or not a lamp lights in a series circuit</p> <p>Recognise conductors &amp; insulators</p>		<p><b>Electricity (NC)</b> Associate the brightness of a lamp or volume of a buzzer with the number and voltage of cells used in the circuit</p> <p>Compare/give reasons for variations in how components function, including brightness of bulbs, loudness of buzzers and on/off position of switches (open and closed circuits)</p> <p>Understand short circuits</p> <p>Understand electric current</p> <p>Use recognised symbols when representing a simple circuit in a diagram</p>
Space			<p><b>Astronomy and The Earth (CKS)</b> Name the sun and 8 planets</p> <p>Know that the sun is a star and is the source of our light and heat (revision of year 1 seasons)</p> <p>Describe basic movement of the planets</p> <p>Understand that the moon moves around the Earth</p> <p>Understand that the Earth rotates</p>			<p><b>Earth and Space (NC)</b> Describe the movement of the Earth, and other planets, relative to the Sun in the solar system (revision and development of yr2)</p> <p>Describe the movement of the Moon relative to the Earth and understand the moon's phases (revision and development of yr2)</p> <p>Describe the Sun, Earth and Moon as approximately spherical bodies</p> <p>Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky</p> <p>Understand Big Bang theory and the universe</p> <p>Understand how seasons are caused by Earth's orbit and rotation</p>	



Progression in Substantive Knowledge - Physics							
	Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<b>Climate and Weather</b>	ELG 15c: Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter	<p><b>Seasonal Changes (NC)</b> Observe changes across the four seasons</p> <p>Observe and describe weather associated with the seasons and how day length varies.</p>				<p><b>Meteorology (CKS)</b> Understand the water cycle (Revision and development of year 4)</p> <p>Name different clouds: cirrus, stratus, cumulus</p> <p>Understand the layers of the atmosphere</p> <p>Understand how the Sun and the Earth heat the atmosphere</p> <p>Understand air movement</p> <p>Understand cold and warm fronts</p> <p>Understand forecasting</p> <p>Understand weather maps</p> <p>Understand difference between weather and climate</p>	



## Progression in the use of scientific vocabulary

- The vocabulary included for Nursery and Reception are words that children should be exposed to. They should use some correctly in a scientific context.
- The vocabulary included from Year 1 onwards are the words that children should know and use correctly in a scientific context. They should be able to define the specialist scientific vocabulary included.
- The vocabulary in **red** is from other linked topics. The topic they come from is indicated.
- The vocabulary in **purple** is from STAR CKS units (Core Knowledge Skills) which extend beyond the National Curriculum
- The Working Scientifically vocabulary identified in the first table of this document should be taught through the topics in each year-group during practical work or scientific enquiry.

## Working Scientifically

Year group(s)	vocabulary
Nursery & Reception	look closely, observe, watch, touch, feel, smell, listen, same, different, compare, ask questions, record, sort, group
Years 1 and 2	observe, changes, patterns, grouping, sorting, compare, same, different, identify (name), measure, data, record results, drawing, picture, table, tally chart, present, pictogram, block chart, Venn diagram, ask questions, test, investigate, explore, equipment, resources, magnifying glass, hand lens, ruler, tape measure, metre stick, pipette, syringe, spoon, teaspoon, answer questions, interpret results, scientific enquiry, pattern seeking, comparative testing, observing over time, classifying, researching using secondary sources
Years 3 and 4	practical work, fair testing, relationships, accurate, thermometer, data logger, stopwatch, timer, estimate, data, diagram, identification key, chart, bar chart, prediction, similarity, difference, evidence, information, findings, criteria, values, properties, characteristics, conclusion, explanation, reason, evaluate, improve
Years 5 and 6	variables, independent variable, dependent variable, control variable, evidence, justify, argument (science), causal relationship, accuracy, precision, scatter graphs, bar graphs, line graphs, force meter

## Plants

Year group(s)	vocabulary
Nursery	plant, leaf, stem, branch, root, bark, flower, petal, seed, berry, fruit, vegetable, bulb, plant, hole, dig, water, weed, grow, shoot, die, dead, soil, names of plants they grow
Reception	<b>tree, bush, herb, names of plants they see (Reception - Living things and their habitats)</b>
Year 1	leaf, flower, blossom, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud, names of trees in the local area, names of garden and wild flowering plants in the local area
Year 2	light, shade, Sun, warm, cool, water, space, grow, healthy, bulb, germinate, shoot, seedling <b>names of plants in local habitats and micro-habitats (Y2 - Living things and their habitats)</b>
Year 3	photosynthesis, pollen, insect/wind pollination, male, female, seed formation, seed dispersal (wind dispersal, animal dispersal, water dispersal), air, nutrients, minerals, soil, absorb, transport
Year 4	<b>classification, classification keys (Y4 - Living things and their habitats)</b>
Year 5	<b>life cycle, reproduce, sexual, fertilises, asexual, plantlets, runners, tubers, cuttings (Y5 - Living things and their habitats)</b>
Year 6	<b>flowering, non-flowering, mosses, ferns, conifers (Y6 - Living things and their habitats)</b>



## Living things and their habitats

Year group(s)	vocabulary
Nursery	natural, plant, animal, leaves, seeds, conkers, acorns, twigs, bark, shells, feathers, pebbles, stones, same, different, pattern plant, leaf, stem, branch, root, bark, flower, petal, seed, berry, fruit, vegetable, bulb, plant, hole, dig, water, weed, grow, shoot, die, dead, soil (Nursery - Plants)
Reception	plant, tree, bush, flower, vegetable, herb, weed, animal, names of plants and animals they see, name of a contrasting environment (e.g. beach, forest)
Year 1	names of garden and wild flowering plants in the local area (Y1 - Plants) head, body, eyes, ears, mouth, teeth, leg, tail, wing, claw, fin, scales, feathers, fur, beak, paws, hooves, names of animals experienced first-hand from each vertebrate group (Y1 - Animals, including humans) weather, sunny, rainy, raining, shower, windy, snowy, cloudy, hot, warm, cold, storm, thunder, lightning, hail, sleet, snow, icy, frost, puddles, rainbow, seasons, winter, summer, spring, autumn, Sun, sunrise, sunset, day length (Y1 - Seasonal changes)
Year 2	living, dead, never been alive, suited, suitable, basic needs, food, food chain, shelter, move, feed, water, air, survive, survival, names of local habitats (e.g. pond, woodland etc.), names of micro-habitats (e.g. under logs, in bushes etc.), conditions, light, dark, shady, sunny, wet, damp, dry, hot, cold, names of living things in the habitats and micro-habitats studied light, shade, Sun, warm, cool, water, space, grow, healthy, bulb, germinate, shoot, seedling (Y2 - Plants) offspring, reproduction, growth, baby, toddler, child, teenager, adult, old person, names of animals and their babies (e.g. chick/chicken, cat/kitten, caterpillar/butterfly) (Y2 - Animals, including humans)
Year 3	photosynthesis, pollen, insect/wind pollination, male, female, seed formation, seed dispersal (e.g. wind dispersal, animal dispersal, water dispersal), air, nutrients, minerals, soil, absorb, transport insect, helpful, harm / harmful, aphids, wasps, bees, butterflies, flowers, pollen, mosquitos, germ, diseases, locusts, Horseflies, head, thorax, abdomen, antennae, exoskeletons, lave, caterpillar, prolegs, cocoon / chrysalis, pupa, pupation, grasshopper, moulting, termites, ant, colony, nectar, cooperate, worker, beehives, waggle, queen bee, worker bee, drone, honeycomb
Year 4	classification, classification keys, environment, habitat, human impact, positive, negative, migrate, hibernate herbivore, carnivore, omnivore, producer, predator, prey (Y4 - Animals, including humans)
Year 5	life cycle, reproduce, sexual, sperm, fertilises, egg, live young, metamorphosis, asexual, plantlets, runners, cuttings
Year 6	vertebrates, fish, amphibians, reptiles, birds, mammals, warm-blooded, cold-blooded, invertebrates, insects, spiders, snails, worms, flowering, non-flowering, mosses, ferns, conifers



## Animals, including humans

Year group(s)	vocabulary
Nursery	egg, chick, bird, caterpillar, cocoon, chrysalis, butterfly, frog spawn, tadpole, froglet, frog, grow, change, die, names of animals and their young, fur, feathers, scales, tail, wings, beak, claws, paws, hooves, swim, walk, run, jump, fly, patterns, spots, stripes, grow, change, baby, toddler, child, adult, old person, smell, taste, touch, feel, hear, see, blind, deaf
Reception	names of animals, live, on land, in water, jungle, desert, North Pole, South Pole, sea, hot, cold, wet, dry, snow, ice, hair (e.g. black, brown, dark, light, blonde, ginger, grey, white, long, short, straight, curly), eyes (e.g. blue, brown, green, grey), skin (e.g. black, brown, white), big/tall, small/short, bigger/smaller, baby, toddler, child, adult, old person, old, young, brother, sister, mother, father, aunt, uncle, grandmother, grandfather, cousin, friend, family, boy, girl, man, woman
Year 1	head, body, eyes, ears, mouth, teeth, leg, tail, wing, claw, fin, scales, feathers, fur, beak, paws, hooves, names of animals experienced first-hand from each vertebrate group, parts of the human body including those within the school's RSE policy, senses, touch, see, smell, taste, hear, fingers, skin, eyes, nose, ears, tongue
Year 2	offspring, reproduction, growth, baby, toddler, child, teenager, adult, old person, names of animals and their babies (e.g. chick/chicken, kitten/cat, caterpillar/butterfly), survive, survival, water, food, air, exercise, heartbeat, breathing, hygiene, germs, disease, food types (e.g. meat, fish, vegetables, bread, rice, pasta, dairy) living, dead, never been alive, suited, suitable, basic needs, food, food chain, shelter, move, feed, water, air, survive, survival (Y2 - Living things and their habitats)
Year 3	nutrition, nutrients, carbohydrates, sugars, protein, vitamins, minerals, fibre, fat, water, skeleton, bones, muscles, joints, support, protect, move, skull, ribs, spine
Year 4	digestive system, digestion, mouth, teeth, saliva, oesophagus, stomach, small intestine, large intestine, rectum, anus, incisor, canine, molar, premolar, herbivore, carnivore, omnivore, producer, predator, prey cornea, iris, pupil, optic nerve, retina, lens, ear canal, ear drum, auditory, nerve, cochlea, ear bones (hammer, anvil and stirrup), outer ear, ear canal, cartilage
Year 5	puberty, the vocabulary to describe sexual characteristics in line with the school's RSE policy life cycle, foetus, baby, child, adolescent, adult, reproduce, sexual, sperm, fertilises, egg, live young (Y5 - Living things and their habitats)
Year 6	heart, pulse, rate, pumps, blood, blood vessels, transported, lungs, oxygen, carbon dioxide, cycle, circulatory system, diet, drugs, lifestyle



## Evolution and inheritance

Year group(s)	vocabulary
Nursery	natural, plant, animal, leaves, seeds, conkers, acorns, twigs, bark, shells, feathers, pebbles, stones, same, different, pattern (Nursery - Living things and their habitats)
Reception	plant, tree, bush, flower, vegetable, herb, weed, animal, names of plants and animals they see, name of a contrasting environment (e.g. beach, forest) (Reception - Living things and their habitats)
Year 1	leaf, flower, blossom, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud (Y1 - Plants)
Year 2	light, shade, Sun, warm, cool, water, space, grow, healthy, bulb, germinate, shoot, seedling (Y2 - Plants) living, dead, never been alive, suited, suitable, basic needs, food, food chain, shelter, move, feed, water, air, survive, survival, conditions, light, dark, shady, sunny, wet, damp, dry, hot, cold (Y2 - Living things and their habitats)
Year 3	photosynthesis, pollen, insect/wind pollination, male, female, seed formation, seed dispersal (e.g. wind dispersal, animal dispersal, water dispersal), air, nutrients, minerals, soil (Y3 - Plants) soil, fossil, bone, flesh, minerals (Y3 - Rocks)
Year 4	environment, habitat, human impact, positive, negative, migrate, hibernate (Y4 - Living things and their habitats) herbivore, carnivore, omnivore, producer, predator, prey (Y4 - Animals, including humans)
Year 5	life cycle, reproduce, sexual, fertilises, asexual, plantlets, runners, tubers, cuttings (Y5 - Living things and their habitats)
Year 6	offspring, sexual reproduction, vary, characteristics, adapted, inherited, species, evolve, evolution

## Seasonal changes / Taking care of the environment

Year group(s)	vocabulary
Nursery	grow, shoot, die, dead (Nursery - Plants) egg, chick, bird, caterpillar, cocoon, chrysalis, butterfly, frog spawn, tadpole, froglet, frog, grow, change, die, names of animals and their young (Nursery - Animals, excluding humans)
Reception	spring, summer, autumn, winter, seasons, sunny, cloudy, hot, warm, cold, shower, raining, storm, thunder, lightning, hail, sleet, snow, icy, frost, puddles, windy, rainbow, animals, young, plants, flowers
Year 1	weather, sunny, rainy, raining, shower, windy, snowy, cloudy, hot, warm, cold, storm, thunder, lightning, hail, sleet, snow, icy, frost, puddles, rainbow, seasons, winter, summer, spring, autumn, Sun, sunrise, sunset, day length natural resources, man-made resources, renewable, non-renewable, pollution, logging, environment, graze, crops, extinct, endangered, contaminated, recycle, conserve





## Materials

Year group(s)	vocabulary
Nursery	mix, stir, cook, hot, oven, microwave, change, burn, melt, hard, runny, set, freeze, freezer, cold, blended, hard, soft, bendy, stiff, wobbly, wood, plastic, paper, card, fabric
Reception	ice, water, frozen, icicle, snow, melt, wet, cold, slippery, smooth, big, bigger, biggest, smaller, smaller, smallest, hard, soft, bendy, rigid, wood, plastic, paper, card, metal, strong, weak, hot, apply heat, waterproof, soggy, not waterproof, best, change, change back
Year 1	object, material, wood, plastic, glass, metal, water, rock, brick, paper, fabric, elastic, foil, card/cardboard, rubber, wool, clay, hard, soft, stretchy, stiff, bendy, floppy, waterproof, absorbent, breaks/tears, rough, smooth, shiny, dull, see-through, not see-through
Year 2	opaque, transparent, translucent, reflective, non-reflective, flexible, rigid, shape, push/pushing, pull/pulling, twist/twisting, squash/squashing, bend/bending, stretch/stretching absorbent, bendy, brittle, bumpy, dull, elastic, flexible, hard, man-made, natural, opaque, rough, shiny, smooth, twist / twisting, properties, changed, change, recycle, fabric, glass, metal, paper, plastic, rubber, squash / squashing, bounce / bouncing, rigid, transparent, waterproof, soft, stretchy, stiff,
Year 3	rock, stone, pebble, boulder, grain, crystals, layers, hard, soft, texture, absorbs water, fossil, bone, flesh, minerals, marble, chalk, granite, sandstone, slate, types of soil (e.g. peaty, sandy, chalky, clay) (Y3 - Rocks) magnetic force, magnet, attract, magnetic material, metal, iron, steel (Y3 - Forces and magnets)
Year 4	solid, liquid, gas, heating, cooling, state change, melting, freezing, melting point, boiling, boiling point, evaporation, condensation, temperature, water cycle electrical conductor, electrical insulator, metal, non-metal (Y4 - Electricity)
Year 5	thermal insulator/conductor, change of state, mixture, dissolve, solution, soluble, insoluble, filter, sieve, reversible/non-reversible change, burning, rusting, new material water cycle, precipitation, condensation, transport, ground water, flow, transpiration, surface run off, infiltration, weather forecast, weather symbols, temperature, wind direction, rain, sleet, sunny, showers, spells of sunshine, heavy rain, thunder, stormy, cirrus, stratus, cumulus, atmosphere, troposphere, stratosphere, mesosphere, thermosphere, exosphere, cold front, warm front, warm air, cold air, prevailing wind, wind direction

## Rocks

Year group(s)	vocabulary
Nursery	natural, shells, pebbles, stones
Reception	
Year 1	object, material, rock, brick, clay, hard, soft, waterproof, absorbent, rough, smooth, shiny, dull, see-through, not see-through (Y1 - Everyday materials)
Year 2	opaque, transparent, translucent, reflective, non-reflective (Y2 - Uses of everyday materials)
Year 3	rock, stone, pebble, boulder, grain, crystals, layers, hard, soft, texture, absorbs water, fossil, bone, flesh, minerals, marble, chalk, granite, sandstone, slate, types of soil (e.g. peaty, sandy, chalky, clay)
Year 5	Crust, mantle, magma, outer core, inner core, earthquake, geologists, vibrations, seismographs, Richer scale, magnitude, plates, boundary, fault, San Andreas fault, epicentre, tsunami, volcanoes, erupts, lava, ash vent, active, dormant, extinct, Mount Vesuvius, Pompeii, archaeologists, dome mountains, folded, minerals, igneous rock, sedimentary rock, metamorphic rock, erosion, glacier, weathering



## Light

Year group(s)	vocabulary
Nursery	light, torch, bulb, lamp, spotlight, shiny, bright, brighter, brightest, Sun, shine, glow, mirror
Reception	Sun, sunny, light, shadow, shady, clouds, torch, see-through, not see-through, source, light source
Year 1	senses, see, eyes (Y1 - Animals, including humans) shiny, dull, see-through, not see-through (Y1 - Materials)
Year 2	opaque, transparent, translucent, reflective, non-reflective (Y2 - Uses of everyday materials)
Year 3	light, light source, dark, absence of light, surface, shadow, reflect, mirror, Sun, sunlight, dangerous
Year 6	straight lines, light rays

## Forces

Year group(s)	vocabulary
Nursery	object, float, sink, water, up, down, top, bottom, push, pull, magnet, spring, squash, bend, twist, stretch, turn, spin, smooth, rough, fast, slow
Reception	float, sink, up, down, top, bottom, surface, move, roll, drop, fly, turn, spin, fall, fast, slow, faster, slower, fastest, slowest, further, furthest, wind, air, water, blow, bounce
Year 2	flexible, rigid, shape, push/pushing, pull/pulling, twist/twisting, squash/squashing, bend/bending, stretch/stretching (Y2 - Uses of everyday materials)
Year 3	force, push, pull, twist, contact force, non-contact force, magnetic force, magnet, strength, bar magnet, ring magnet, button magnet, horseshoe magnet, attract, repel, magnetic material, metal, iron, steel, poles, north pole, south pole
Year 5	force, gravity, Earth, air resistance, water resistance, friction, mechanisms, simple machines, levers, pulleys, gears

## Sound

Year group(s)	vocabulary
Nursery	sound, noise, loud, quiet, high, low, music, bang, blow, pluck, soft, hard, fast, slow, names of instruments
Reception	sound, noise, listen, hear, music, voices, bird song, traffic, sirens, thunder, high, low, loud, quiet, soft, volume, crackle, thunder, hum, buzz, roar
Year 1	senses, hear, ear (Y1 - Animals, including humans)
Year 4	sound, source, vibrate, vibration, travel, pitch (high, low), volume, faint, quiet, loud, insulation



## Electricity

Year group(s)	vocabulary
Nursery	battery, plug, socket, electricity, wire, sound, light, move
Reception	battery, plug, socket, electricity, wire, sound, light, move
Year 4	electricity, electrical appliance/device, mains, plug, electrical circuit, complete circuit, component, cell, battery, positive, negative, connect/connections, loose connection, short circuit, crocodile clip, bulb, switch, buzzer, motor, conductor, insulator, metal, non-metal, symbol
Year 6	circuit diagram, circuit symbol, voltage

## Earth and Space

Year group(s)	vocabulary
Reception	Sun, Moon, Earth, star, planet, sky, day, night, space, round, bounce, float
Year 2	Planet, dwarf planet, Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune, Pluto, solar system, orbit, rotate, rotation, spinning, axis, moon, Sun, light source
Year 3	light, light source, Sun, sunlight, dangerous (Y3 - Light)
Year 5	Sun, Moon, Earth, planets (Mercury, Jupiter, Saturn, Venus, Mars, Uranus, Neptune), spherical, Solar System, rotate, star, orbit



### Long Term Science Plan

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
<b>Year 1</b>	Animals, Including Humans (NC) <i>Jane Goodall (studied chimps)</i>	Everyday Materials (NC) <i>Charles Macintosh</i>	Plants (NC) <i>Joseph Banks (Botanist)</i>	Introduction to Magnetism (CKS) <i>Albert Einstein (physicist)</i>	Taking Care of the Earth (CKS)	Seasonal Changes (NC)
	<i>Seasonal Changes throughout the year as appropriate to the changing seasons</i>					
<b>Year 2</b>	Animals, Including Humans (NC)	Living Things and their Habitats (NC)	Electricity (CKS) <i>John Dunlop or C. Macintosh (creating new materials)</i>	Plants (NC)	Matter (NC) <i>Thomas Edison (light bulb)</i>	Astronomy and The Earth (CKS) <i>Galileo Galilei (astronomer) Copernicus (solar system)</i>
<b>Year 3</b>	Animals including humans (NC) <i>Louis Pasteur (vaccinations) A. Fleming (penicillin)</i>	Forces and Magnets (NC) <i>Albert Einstein (physicist)</i>	Rocks (NC) <i>Mary Anning (fossil hunter)</i>	Plants (NC)	Light (NC)	Insects (CKS)
<b>Year 4</b>	States of matter (NC)	Animals, Including Humans (NC)	Sound (NC) <i>Alexander Bell (inventor of telephone)</i>	Electricity (NC) <i>Michael Faraday (invented electric motor)</i>	The Human Body: Systems, Vision and Hearing (CKS)	Living Things and their habitats (NC) <i>Rachel Carson (pollution)</i>
<b>Year 5</b>	Forces (NC) <i>Isaac Newton (gravity) Albert Einstein (physicist)</i>	Properties and changes of materials (NC) <i>Spencer Silver (invented glue) Benetton (wrinkle free cotton)</i>	Earth & Space (NC) <i>Galileo Galilei (astronomer) Copernicus (solar system) Stephen Hawking (physicist)</i>	Living things and their Habitats (NC) [inc Animals inc Humans] <i>David Attenborough (naturalist)</i>	Meteorology (CKS)	Geology (CKS) <i>Leonardo Da Vinci (anatomist and geologist)</i>
<b>Year 6</b>	Animals, Including Humans (NC)	Living Things and their habitats (NC) <i>Carl Linnaeus (classification)</i>	Light (NC)	Evolution and Inheritance (NC) <i>Charles Darwin (theory of evolution)</i>	Electricity (NC) <i>Michael Faraday (invented electric motor)</i>	Chemistry: Matter and Change (CKS)

\*Pupils should study at least two influential scientists per year, supported by above exemplar scientists.