

# Year 1 - Progression of Skills and Vocabulary in Science

<p><b>Year 1</b></p>	<p><b>National Curriculum Key Stage 1:</b>  <b>The principal focus of science teaching in key stage 1 is to enable pupils to experience and observe phenomena, looking more closely at the natural and humanly constructed world around them. They should be encouraged to be curious and ask questions about what they notice. They should be helped to develop their understanding of scientific ideas by using different types of scientific enquiry to answer their own questions, including observing changes over a period of time, noticing patterns, grouping and classifying things, carrying out simple comparative tests, and finding things out using secondary sources of information. They should begin to use simple scientific language to talk about what they have found out and communicate their ideas to a range of audiences in a variety of ways. Most of the learning about science should be done through the use of first-hand practical experiences, but there should also be some use of appropriate secondary sources, such as books, photographs and videos.</b></p>		
<p><b>Animals, including Humans</b></p>	<ul style="list-style-type: none"> <li>• identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals</li> <li>• identify and name a variety of common animals that are carnivores, herbivores and omnivores</li> <li>• describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets)</li> <li>• identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense</li> </ul>	<p>Fish, Reptiles, Mammals, Birds, Amphibians, Herbivore, Omnivore, Carnivore, Leg, Arm, Elbow, Head, Ear, Nose, Back, Wings, Beak.</p>	<p><i>Possible Skills Links</i>  <i>identifying and classifying</i></p>
<p><b>Everyday Materials</b></p>	<ul style="list-style-type: none"> <li>• distinguish between an object and the material from which it is made</li> <li>• identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock</li> <li>• describe the simple physical properties of a variety of everyday materials</li> <li>• compare and group together a variety of everyday materials on the basis of their simple physical properties</li> </ul>	<p>Wood, Plastic, Glass, Paper, Water, Metal, Rock, Hard, Soft, Bendy, Rough, Smooth.</p>	<p><i>asking simple questions and recognising that they can be answered in different ways</i>  <i>performing simple tests</i></p>
<p><b>Plants</b></p>	<ul style="list-style-type: none"> <li>• identify and name a variety of common wild and garden plants, including deciduous and evergreen trees</li> <li>• identify and describe the basic structure of a variety of common flowering plants, including trees</li> </ul>	<p>Deciduous, Evergreen trees, Leaves, Flowers, Petals, Fruit, Roots, Bulb, Seed, Trunk, Branches, Stem.</p>	<p><i>observing closely, using simple equipment</i>  <i>using their observations and ideas to suggest answers to questions</i></p>

<b>Seasonal Changes</b>	<ul style="list-style-type: none"> <li>observe changes across the 4 seasons</li> <li>observe and describe weather associated with the seasons and how day length varies</li> </ul>	Summer, Spring, Autumn, Winter, Sun, Day, Moon, Night, Light, Dark.	<i>gathering and recording data to help in answering questions</i>
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**Working Scientifically**

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**Question, Answer, Sort, Compare, Observe, Group, Diagram.**

Questioning	Observations	Testing	Identifying and Classifying	Gathering and Recording Data	Explanations	Using Results	Scientific Evidence
To ask simple questions. <i>for example, about what they notice – Why are the leaves different colours?</i>	To observe closely. <i>for example, looking at the characteristics of different animals or differences in seeds</i>	To perform simple tests. <i>for example, growing a plant with and without light/water</i>	To observe changes over time. <i>for example, changes in weather daily and over a longer duration</i>  To use simple features to compare objects, materials and living things. <i>for example, observing and comparing which materials are hard or soft</i>	To gather and record simple data. <i>for example, ticking and crossing to show if a material is hard or soft</i>	To talk about what they have done. <i>for example, explaining how they have placed one plant in darkness while the other receives light</i>	To use results to suggest answers to questions. <i>for example, suggesting which material would be best for a pillowcase</i>	To use simple secondary sources to find answers. <i>for example, using information found in a video to describe what a plant needs to grow</i>

# Year 2 - Progression of Skills and Vocabulary in Science

<p><b>Year 2</b></p>	<p><b>National Curriculum Key Stage 1:</b>  <b>The principal focus of science teaching in key stage 1 is to enable pupils to experience and observe phenomena, looking more closely at the natural and humanly constructed world around them. They should be encouraged to be curious and ask questions about what they notice. They should be helped to develop their understanding of scientific ideas by using different types of scientific enquiry to answer their own questions, including observing changes over a period of time, noticing patterns, grouping and classifying things, carrying out simple comparative tests, and finding things out using secondary sources of information. They should begin to use simple scientific language to talk about what they have found out and communicate their ideas to a range of audiences in a variety of ways. Most of the learning about science should be done through the use of first-hand practical experiences, but there should also be some use of appropriate secondary sources, such as books, photographs and videos.</b></p>		
<p><b>Animals, including Humans</b></p>	<ul style="list-style-type: none"> <li>notice that animals, including humans, have offspring which grow into adults</li> <li>find out about and describe the basic needs of animals, including humans, for survival (water, food and air)</li> <li>describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene</li> </ul>	<p>Survival, Water, Air, Food, Adult, Baby, Offspring, Kitten, Calf, Puppy, Exercise, Hygiene</p>	<p><i>Possible Skills Links</i>  <i>gathering and recording data to help in answering questions</i></p>
<p><b>Uses of Everyday Materials</b></p>	<ul style="list-style-type: none"> <li>identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses</li> <li>find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching</li> </ul>	<p>Hard, Soft, Stretchy, Stiff, Shiny, Dull, Rough, Smooth, Bendy, Waterproof, Absorbent, Opaque, Transparent, Brick, Paper, Fabrics, Squashing, Bending, Twisting, Stretching Elastic, Foil.</p>	<p><i>using their observations and ideas to suggest answers to questions</i></p>
<p><b>Plants</b></p>	<ul style="list-style-type: none"> <li>observe and describe how seeds and bulbs grow into mature plants</li> <li>find out and describe how plants need water, light and a suitable temperature to grow and stay healthy</li> </ul>	<p>Seeds, Bulbs, Water, Light, Temperature, Growth.</p>	<p><i>observing closely, using simple equipment</i>  <i>performing simple tests</i></p>

<p><b>Living things and their habitats</b></p>	<ul style="list-style-type: none"> <li>• explore and compare the differences between things that are living, dead, and things that have never been alive</li> <li>• 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</li> <li>• identify and name a variety of plants and animals in their habitats, including microhabitats</li> <li>• 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</li> </ul>	<p>Living, Dead, Habitat, Energy, Food chain, Predator, Prey, Woodland, Pond, Desert.</p>	<p><i>identifying and classifying asking simple questions and recognising that they can be answered in different ways</i></p>
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**Working Scientifically**

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*Classify, Describe, Observing, Equipment, Identify, Contrast, Chart, Map, Data, Biology, Chemistry, Physics.*

Questioning	Observations	Testing	Identifying and Classifying	Gathering and Recording Data	Explanations	Using Results	Scientific Evidence
<p>To ask simple questions and recognise they can be answered in different ways. <i>for example, asking which material would be best for an umbrella and knowing this could include how waterproof or strong or big it is</i></p>	<p>To observe closely using simple equipment. <i>for example, using hand lenses to observe the characteristics of insects</i></p>	<p>To perform simple tests and begin to recognise ways in which they might answer scientific questions. <i>for example, understanding that carrying out a test on different materials could answer the question 'Which material is most waterproof?'</i></p>	<p>To begin to notice patterns and relationships. <i>for example, noticing the relationship between certain weathers and different times of the year</i></p> <p>To decide how to sort and group objects, materials and living things. <i>for example, knowing that materials can be sorted into rough and smooth, or waterproof and not waterproof</i></p>	<p>To gather and record simple data in different ways. <i>for example, rating how soft or hard a material is by giving a rating out of 5</i></p>	<p>To talk about what they have found out and how. <i>for example, explaining how the experiment has taught them that plants need light to grow</i></p>	<p>To use results to suggest answers to questions, using simple scientific language. <i>for example, suggesting a certain material would be the best for an umbrella because it is the most waterproof</i></p>	<p>To use secondary sources to find answers. <i>for example, using information found in diagrams to describe characteristics of different animals</i></p>

# Year 3 - Progression of Skills and Vocabulary in Science

<p><b>Year 3</b></p>	<p><b>National Curriculum Lower Key Stage 2:</b>  <b>The principal focus of science teaching in lower key stage 2 is to enable pupils to broaden their scientific view of the world around them. They should do this through exploring, talking about, testing and developing ideas about everyday phenomena and the relationships between living things and familiar environments, and by beginning to develop their ideas about functions, relationships and interactions. They should ask their own questions about what they observe and make some decisions about which types of scientific enquiry are likely to be the best ways of answering them, including observing changes over time, noticing patterns, grouping and classifying things, carrying out simple comparative and fair tests and finding things out using secondary sources of information. They should draw simple conclusions and use some scientific language, first, to talk about and, later, to write about what they have found out.</b></p>		
<p><b>Forces and Magnets</b></p>	<ul style="list-style-type: none"> <li>compare how things move on different surfaces</li> <li>notice that some forces need contact between 2 objects, but magnetic forces can act at a distance</li> <li>observe how magnets attract or repel each other and attract some materials and not others</li> <li>compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials</li> <li>describe magnets as having 2 poles</li> <li>predict whether 2 magnets will attract or repel each other, depending on which poles are facing</li> </ul>	<p>Magnetic, Force, Contact, Attract, Repel, Friction, Poles, Push, Pull</p>	<p><i>Possible Skills Links</i>  <i>setting up simple practical enquiries, comparative and fair tests</i></p>
<p><b>Animals, including Humans</b></p>	<ul style="list-style-type: none"> <li>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</li> <li>identify that humans and some other animals have skeletons and muscles for support, protection and movement</li> </ul>	<p>Movement, Muscles, Bones, Skull, Nutrition, Skeletons.</p>	<p><i>gathering, recording, classifying and presenting data in a variety of ways to help in answering questions</i></p>
<p><b>Plants</b></p>	<ul style="list-style-type: none"> <li>identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers</li> <li>explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant</li> <li>investigate the way in which water is transported within plants</li> <li>explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal</li> </ul>	<p>Air, Light, Water, Nutrients, Soil, Reproduction, Transportation, Dispersal, Pollination, Flower.</p>	<p><i>using results to draw simple conclusions, make predictions for new values</i></p>
<p><b>Light</b></p>	<ul style="list-style-type: none"> <li>recognise that they need light in order to see things and that dark is the absence of light</li> <li>notice that light is reflected from surfaces</li> <li>recognise that light from the sun can be dangerous and that there are ways to protect their eyes</li> <li>recognise that shadows are formed when the light from a light source is blocked by an opaque object</li> <li>find patterns in the way that the size of shadows change</li> </ul>	<p>Light, Shadows, Mirror, Reflective, Dark, Reflection</p>	

<b>Rocks</b>	<ul style="list-style-type: none"> <li>compare and group together different kinds of rocks on the basis of their appearance and simple physical properties</li> <li>describe in simple terms how fossils are formed when things that have lived are trapped within rock</li> <li>recognise that soils are made from rocks and organic matter</li> </ul>	Fossils, Soils, Sandstone, Granite, Marble, Pumice, Crystals, Absorbent.	<i>identifying differences, similarities or changes related to simple scientific ideas and processes</i>
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**Relevant, Enquiry, Careful, Observation, Accurate, Gather, Record, Drawings, Similarities, Differences, Sources, Conclusion, Prediction**

<i>Questioning</i>	<i>Observations</i>	<i>Testing</i>	<i>Identifying and Classifying</i>	<i>Gathering and Recording Data</i>	<i>Explanations</i>	<i>Using Results</i>	<i>Scientific Evidence</i>
To ask relevant questions and consider how they can be answered. <i>for example, asking which rocks are the strongest and knowing this could be answered by using a scratch test</i>	To make systematic and careful observations. <i>for example, carrying out a more structured observation by using a set frame/hoop to observe the number of insects in a certain habitat</i>	To set up simple practical enquiries including comparative tests. <i>for example, setting up an enquiry into rock erosion using three different types of rock</i>	To develop own criteria for grouping, sorting and classifying. <i>for example, using a venn diagram to sort materials into transparent, opaque or both</i>	To gather and record findings using drawings and labelled diagrams. <i>for example, labelling a diagram to show findings of position of shadows at different times of the day</i>	To report on findings from enquiries using oral explanations. <i>for example, explaining the methodology and findings of their enquiry in more detail</i>	To use results to draw simple conclusions and suggest improvements. <i>for example, suggesting that their investigation could have been improved by using equipment that would have given a more accurate reading</i>	To use straightforward scientific evidence to answer questions. <i>for example, using a scientific text to find out the number of bones in the human body</i>

# Year 4 - Progression of Skills and Vocabulary in Science

<p><b>Year 4</b></p>	<p><b>National Curriculum Lower Key Stage 2:</b>  <b>The principal focus of science teaching in lower key stage 2 is to enable pupils to broaden their scientific view of the world around them. They should do this through exploring, talking about, testing and developing ideas about everyday phenomena and the relationships between living things and familiar environments, and by beginning to develop their ideas about functions, relationships and interactions. They should ask their own questions about what they observe and make some decisions about which types of scientific enquiry are likely to be the best ways of answering them, including observing changes over time, noticing patterns, grouping and classifying things, carrying out simple comparative and fair tests and finding things out using secondary sources of information. They should draw simple conclusions and use some scientific language, first, to talk about and, later, to write about what they have found out.</b></p>		
<p><b>Electricity</b></p>	<ul style="list-style-type: none"> <li>• identify common appliances that run on electricity</li> <li>• construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers</li> <li>• 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</li> <li>• recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit</li> <li>• recognise some common conductors and insulators, and associate metals with being good conductors</li> </ul>	<p>Cells, Wires, Bulbs, Switches, Buzzers, Battery, Circuit, Series, Conductors, Insulators</p>	<p><i>Possible Skills Links</i>  <i>using straightforward scientific evidence to answer questions or to support their findings.</i></p>
<p><b>States of Matter</b></p>	<ul style="list-style-type: none"> <li>• compare and group materials together, according to whether they are solids, liquids or gases</li> <li>• observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C)</li> <li>• identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature</li> </ul>	<p>Solid, Liquid, Gas, Evaporation, Condensation, Particles, Temperature, Freezing, Heating</p>	<p><i>making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers</i>  <i>reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions</i></p>
<p><b>Sound</b></p>	<ul style="list-style-type: none"> <li>• identify how sounds are made, associating some of them with something vibrating</li> <li>• recognise that vibrations from sounds travel through a medium to the ear</li> <li>• find patterns between the pitch of a sound and features of the object that produced it</li> <li>• find patterns between the volume of a sound and the strength of the vibrations that produced it</li> <li>• recognise that sounds get fainter as the distance from the sound source increases</li> </ul>	<p>Volume, Vibration, Wave, Pitch, Tone, Speaker.</p>	<p><i>using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions</i></p>

<b>Living Things and their Habitats</b>	<ul style="list-style-type: none"> <li>recognise that living things can be grouped in a variety of ways</li> <li>explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment</li> <li>recognise that environments can change and that this can sometimes pose dangers to living things</li> </ul>	Vertebrates, Fish, Amphibians, Reptiles, Birds, Mammals, Invertebrates, Snails, Slugs, Worms, Spiders, Insects, Environment, Habitats.	<i>recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables</i>
<b>Animals, including Humans</b>	<ul style="list-style-type: none"> <li>describe the simple functions of the basic parts of the digestive system in humans</li> <li>identify the different types of teeth in humans and their simple functions</li> <li>construct and interpret a variety of food chains, identifying producers, predators and prey</li> </ul>	Mouth, Tongue, Teeth, Oesophagus, Stomach, Small Intestine, Large Intestine, Herbivore, Carnivore, Canine, Incisor, Molar.	

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*Comparative, Fair Test, Systematic, Thermometer, Data logger, Classify, Present, Labelled Diagrams, Evidence, Interpret, Construct.*

<i>Questioning</i>	<i>Observations</i>	<i>Testing</i>	<i>Identifying and Classifying</i>	<i>Gathering and Recording Data</i>	<i>Explanations</i>	<i>Using Results</i>	<i>Scientific Evidence</i>
To ask relevant questions and consider different types of enquiries to answer them. <i>for example, asking about the relationship between distance and volume and suggesting different ways this could be investigated</i>	To take accurate measurements using standard units, using a range of equipment. <i>for example, using thermometers to observe differences in temperature within different areas</i>	To set up simple practical enquiries, including comparative and fair tests. <i>for example, setting up a fair test by looking at the effect of temperature on evaporation</i>	To select and plan the most appropriate type of scientific enquiry. To recognise when and how to set up comparative and fair tests. <i>for example, to know that a comparative test is appropriate when finding which materials are soluble</i>	To gather and record findings using keys, bar charts and tables. <i>for example, recording results of the temperature materials change state, and using a simple bar chart to present this data</i>	To report on findings from enquiries using oral explanations, displays and presentation of results and conclusions. <i>for example, explaining how when investigating sound, they found that the further away they were, the quieter the sound. They recognise this may be because sound travels in a wave</i>	To use results to make predictions for new values and raise further questions. <i>for example, when investigating sound over different distances, they can predict values for intervals between and after the ones tested</i>	To use straightforward scientific evidence to answer questions and support their own findings. <i>for example, can use a scientific text and find information that supports their own results and ideas</i>



# Year 5 - Progression of Skills and Vocabulary in Science

<p><b>Year 5</b></p>	<p><b>National Curriculum Upper Key Stage 2:</b>  <b>The principal focus of science teaching in upper key stage 2 is to enable pupils to develop a deeper understanding of a wide range of scientific ideas. They should do this through exploring and talking about their ideas; asking their own questions about scientific phenomena; and analysing functions, relationships and interactions more systematically. At upper key stage 2, they should encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. They should also begin to recognise that scientific ideas change and develop over time. They should select the most appropriate ways to answer science questions using different types of scientific enquiry, including observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests and finding things out using a wide range of secondary sources of information. Pupils should draw conclusions based on their data and observations, use evidence to justify their ideas, and use their scientific knowledge and understanding to explain their findings.</b></p>		
<p><b>Earth and Space</b></p>	<ul style="list-style-type: none"> <li>describe the movement of the Earth and other planets relative to the sun in the solar system</li> <li>describe the movement of the moon relative to the Earth</li> <li>describe the sun, Earth and moon as approximately spherical bodies</li> <li>use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky</li> </ul>	<p>Earth, Sun, Moon, Axis, Rotation, Day, Night, Phases of the Moon, star, Constellation.</p>	<p><i>Possible Skills Links</i></p> <p><i>identifying scientific evidence that has been used to support or refute ideas or arguments</i></p>
<p><b>Forces</b></p>	<ul style="list-style-type: none"> <li>explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object</li> <li>identify the effects of air resistance, water resistance and friction, that act between moving surfaces</li> <li>recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect</li> </ul>	<p>Air resistance, Water resistance, Friction, Gravity, Newton, Gears, Pulleys.</p>	<p><i>planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary</i></p> <p><i>taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate</i></p>
<p><b>Properties and Changes in Materials</b></p>	<ul style="list-style-type: none"> <li>compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets</li> <li>know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution</li> <li>use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating</li> <li>give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic</li> </ul>	<p>Hardness, Solubility, Transparency, Conductivity, Magnetic, Filter, Evaporation, Dissolving, Mixing.</p>	

	<ul style="list-style-type: none"> <li>demonstrate that dissolving, mixing and changes of state are reversible changes</li> <li>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</li> </ul>		
<b>Living Things and their Habitats</b>	<ul style="list-style-type: none"> <li>describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird</li> <li>describe the life process of reproduction in some plants and animals</li> </ul>	Mammal, Reproduction, Insect, Amphibian, Bird, Offspring.	
<b>Animals, including Humans</b>	<ul style="list-style-type: none"> <li>describe the changes as humans develop to old age</li> </ul>	Foetus, Embryo, Womb, Gestation, Baby, Toddler, Teenager, Elderly, Growth, Development, Puberty.	

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Measurements, Accuracy, Causal Relationship, Explanations, Patterns, Systematic.

Questioning	Observations	Testing	Identifying and Classifying	Gathering and Recording Data	Explanations	Using Results	Scientific Evidence
To raise a breadth of topic specific questions. <i>for example, does temperature have an effect on time taken for solutions to dissolve in water? Would there be a difference when using lemonade? What other factors would effect time taken for solutions to dissolve?</i>	To observe and take measurements using a range of scientific equipment with increasing accuracy. <i>for example, using Newton metres to measure forces or protractors to measure angles when testing friction</i>	To select and plan the most appropriate type of scientific enquiry. To recognise when and how to set up comparative and fair tests. <i>for example, to know that a comparative test is appropriate when finding which materials are soluble</i>	To use keys to identify, classify and describe living things and materials. <i>for example, to use a set of questions to classify reptiles, birds, mammals and amphibians</i>	To gather and record results of increasing complexity using diagrams and labels, classification keys and tables. <i>for example, recording results in a table that involved multiple time points, and use a grouped bar chart to present this data</i>	To report and present findings including conclusions and relationships. <i>for example, explaining how their results show a relationship between two things, such as temperature and evaporation</i>	To use results to make predictions and set up further comparative and fair tests. <i>for example, after investigating the temperature solutions dissolve in water, they set up a comparative test with water and other liquids</i>	To identify scientific evidence that has been used to support or refute ideas or arguments. <i>for example, can use a range of sources such as pictures, videos, recounts and texts and explain where findings are the same or differ from their own</i>

# Year 6 - Progression of Skills and Vocabulary in Science

<p><b>Year 6</b></p>	<p><b>National Curriculum Upper Key Stage 2:</b>  <b>The principal focus of science teaching in upper key stage 2 is to enable pupils to develop a deeper understanding of a wide range of scientific ideas. They should do this through exploring and talking about their ideas; asking their own questions about scientific phenomena; and analysing functions, relationships and interactions more systematically. At upper key stage 2, they should encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. They should also begin to recognise that scientific ideas change and develop over time. They should select the most appropriate ways to answer science questions using different types of scientific enquiry, including observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests and finding things out using a wide range of secondary sources of information. Pupils should draw conclusions based on their data and observations, use evidence to justify their ideas, and use their scientific knowledge and understanding to explain their findings.</b></p>		
<p><b>Light</b></p>	<ul style="list-style-type: none"> <li>• recognise that light appears to travel in straight lines</li> <li>• 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</li> <li>• 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</li> <li>• use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them</li> </ul>	<p>Refraction, Reflection, Light, Spectrum, Rainbow, Colour.</p>	<p><i>Possible Skills Links</i></p> <p><i>planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary</i></p>
<p><b>Electricity</b></p>	<ul style="list-style-type: none"> <li>• associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit</li> <li>• 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</li> <li>• use recognised symbols when representing a simple circuit in a diagram</li> </ul>	<p>Cells, Wires, Bulbs, Switches, Buzzers, Battery, Circuit, Series, Conductors, Insulators, Amps, Volts, Cell.</p>	
<p><b>Animals, including Humans</b></p>	<ul style="list-style-type: none"> <li>• identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood</li> <li>• recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function</li> <li>• describe the ways in which nutrients and water are transported within animals, including humans</li> </ul>	<p>Circulatory, Heart, Blood Vessels, Veins, Arteries, Oxygenated, Deoxygenated, Valve, Exercise, Respiration.</p>	<p><i>recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs</i></p> <p><i>using test results to make predictions to set up further comparative and fair tests</i></p> <p><i>reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations</i></p>

<b>Living Things and their Habitats</b>	<ul style="list-style-type: none"> <li>describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals</li> <li>give reasons for classifying plants and animals based on specific characteristics</li> </ul>	Classification, Vertebrates, Invertebrates, Micro-organisms, Amphibians, Reptiles, Mammals, Insects.	
<b>Evolution and Inheritance</b>	<ul style="list-style-type: none"> <li>recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago</li> <li>recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents</li> <li>identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution</li> </ul>	Fossils, Adaptation, Evolution, Characteristics, Reproduction, Genetics.	<i>identifying scientific evidence that has been used to support or refute ideas or arguments</i>

### Working Scientifically

**National Curriculum Guidance:**  
**'Working scientifically' specifies the understanding of the nature, processes and methods of science for each year group. It should not be taught as a separate strand. These types of scientific enquiry should include observing over time; pattern seeking; identifying, classifying and grouping; comparative and fair testing (controlled investigations); and researching using secondary sources. Pupils should seek answers to questions through collecting, analysing and presenting data.**

**Variables, Precision, Repeat Readings, Degree of Trust, Support, Refute, Quantitative.**

Questioning	Observations	Testing	Identifying and Classifying	Gathering and Recording Data	Explanations	Using Results	Scientific Evidence
<p>To raise a breadth of topic specific questions and to explore these ideas.</p> <p><i>for example, asking whether the amount of wires has an impact on the brightness of a bulb within a circuit and independently setting up an investigation to explore this</i></p>	<p>To observe and take accurate measurements with increasing accuracy and precision, taking repeat readings when appropriate.</p> <p><i>for example, taking repeat readings to check reliability of measurements when looking at the relationship between exercise intensity and pulse</i></p>	<p>To explain which variables need to be controlled and why for different types of enquiry.</p> <p><i>for example, to know that when looking at the relationship between exercise intensity and pulse, resting heart rate would need to be controlled prior to the exercise and also the time taken to record results</i></p>	<p>To use information records and keys to identify, classify and describe living things and materials.</p> <p><i>for example, to develop a classification key using own understanding to classify animals</i></p>	<p>To gather and record results of increasing complexity using scatter graphs, bar graphs and line graphs.</p> <p><i>for example, collecting a breadth of data to plot onto a scatter graph, and using this as a basis to discuss anomalies</i></p>	<p>To report and present findings including explanations of and a degree of trust in results.</p> <p><i>for example, explaining how although they have tested the way in which different materials block light, their results may not be completely accurate due to the changing of natural light in the room</i></p>	<p>To use results to identify when further tests and observations might be needed.</p> <p><i>for example, when finding large discrepancies between results when taking repeat readings, they decide to take further readings</i></p>	<p>To recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact.</p> <p><i>for example, can research their own information on a computer or in text books and know if ideas are evidenced as opposed to an opinion</i></p>