

Whole School Progression: Key Stage Two

	Year 3	Year 4	Year 5	Year 6
Working Scientifically	<p>Asking Questions and Making Predictions</p> <ul style="list-style-type: none">I can ask relevant questions about what has been observed.I can use prior knowledge to make predictions. <p>Making Observations and Taking Measurements</p> <ul style="list-style-type: none">I can make systematic and careful observationsI can take accurate measurements using standard units.I can use a range of equipment, including thermometers, microscopes and data loggers, to measure length, time, temperature and capacity. <p>Practical Enquiry</p> <ul style="list-style-type: none">I can make decisions about which types of scientific enquiry are likely to be the best way of answering a question.I can suggest what observations to make, how long to make them, and what equipment to use.I can suggest ways to ensure fair testing, during a scientific enquiry.I can set up simple practical enquiries; observations over time, pattern seeking enquiries, comparative and fair tests. <p>Recording and Presenting Evidence</p> <ul style="list-style-type: none">I can make decisions about how to record and analyse data.I can gather, record, classify and present data in a variety of ways to help in answering questionsI can record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables <p>Answering Questions and Concluding</p> <ul style="list-style-type: none">I can report on findings from enquiries, using straightforward scientific evidence.I can use results to draw simple conclusions, make further predictions and raise further questions.I recognise when secondary sources can be used to answer questions, that cannot be answered by practical work.I can identify patterns, similarities and differences, in data, to draw simple conclusions. <p>Evaluation and Raising Further Questions and Predictions</p> <ul style="list-style-type: none">I can evaluate an investigation, suggesting future improvements, saying what went well and posing further questions. <p>Communicating Findings</p> <ul style="list-style-type: none">I can report on findings from enquiries, including oral and written explanations, models or presentations of results and conclusions.I can use straightforward scientific evidence to answer questions or to support my findings.I can use scientific vocabulary to communicate my findings. <p>Understanding of the Science Community</p> <ul style="list-style-type: none">I am aware of the specific contributions of science in industry and everyday life.I can talk about a range of scientists and explain their main ideas.	<p>Asking Questions and Making Predictions</p> <ul style="list-style-type: none">I can independently ask scientific questions, using my prior knowledge and experiences.I can make predictions using prior knowledge and scientific evidence. <p>Making Observations and Taking Measurements</p> <ul style="list-style-type: none">I can select measuring equipment to give the most precise results; e.g. ruler, tape measure, trundle wheel, and force meter (with a suitable scale).I can take measurements with increasing accuracy and precision.I can take repeat readings when appropriate (fair testing) e.g. taking a mean score.I can adjust my method of taking measurements, in order to get more accurate data e.g. increase sample size, longer observation period. <p>Practical Enquiry</p> <ul style="list-style-type: none">I can select and plan the most appropriate type of enquiry to answer questions, justifying my choice.I can plan and set up fair tests explaining which variables need to be controlled and why. <p>Recording and Presenting Evidence</p> <ul style="list-style-type: none">I can make decisions about how to record and analyse data.I can record data and results of increasing complexity using scientific diagrams and labels, tables, scatter graphs, bar and line graphs.I can use and develop keys, Carroll and Venn diagrams to record classifications. <p>Answering Questions and Concluding</p> <ul style="list-style-type: none">I recognise when secondary sources can be used to answer questions that cannot be answered by practical work.I can draw conclusions based on different causal relationships in data and observations.I can use scientific knowledge and understanding to explain my findings. <p>Evaluation and Raising Further Questions and Predictions</p> <ul style="list-style-type: none">I can identify scientific evidence that has been used to support or refute ideas or arguments.I can use test results to identify when further tests and observations might be needed.I can make further predictions and raise further questions that can be investigated using comparative and fair tests. <p>Communicating Findings</p> <ul style="list-style-type: none">I can use relevant scientific language and illustrations to discuss, communicate and justify scientific ideas.I can report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms. <p>Understanding of the Science Community</p> <ul style="list-style-type: none">I am aware of the specific contributions of science in industry and everyday life.I can talk about a range of scientists, explain their main ideas, and achievements.I can talk about how scientific ideas have changed and developed over time.		

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Plants	<ul style="list-style-type: none"> I can discover how seeds are formed by observing the different stages of plant life cycles over a period of time. I can identify and describe the functions of different parts of flowering plants. (roots, stem/trunks, leaves and flowers). I can 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. <i>NB Chn can be introduced to the idea that plants can make their own food, but do not need to understand how this happens at this stage.</i> I can investigate the way in which water is transported within plants. I can explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. I can compare the effect of different factors on plant growth – for example the amount of light and the amount of fertiliser. 			
Animals (including humans)	<ul style="list-style-type: none"> I can identify that animals including humans need the right types and amounts of nutrition and that they cannot make their own food. I can identify that humans and some other animals have skeletons and muscles for support, protection and movement. I can identify and group different animals with and without skeletons (using the terms endoskeleton, exoskeleton, vertebrate and invertebrates) I can compare and observe different animal's movements. I can compare and contrast the diets of different animals and group them accordingly. 	<ul style="list-style-type: none"> I can describe the simple functions of the basic parts of the digestive system in humans. (Mouth, tongue, teeth, oesophagus, stomach, large and small intestine). I can identify the different types of teeth in humans and their functions. (incisors for biting and chewing, canine for tearing and ripping, molars for crushing and grinding). I can compare the teeth of carnivores and herbivores and suggest reasons for differences. I can find out what damages teeth and how to look after them. I can construct and interpret a variety of food chains, identifying producers, predators, and prey. 	<ul style="list-style-type: none"> I can describe the stages of growth of a human (embryo, foetus, baby, child, adolescent, adult, old age). I can explain the changes experienced during puberty. I can explain the changes experienced during old age. I can research the gestation periods of other animals (hamster, dog, elephant) and compare them to humans. I can investigate the relationship between a mammal's size, its gestation period and their number of offspring. 	<ul style="list-style-type: none"> I can identify and name the parts of the human circulatory system (heart, arteries, veins and blood). I can describe the functions of the heart, arteries, veins and blood. I can recognise the impact of diet, exercise drugs and lifestyle on the way my body functions. I can describe the ways in which nutrients and water are transported within animals including humans. I can explain who Marie M Daly was.



SCIENCE- Knowledge and Key Skills#



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Rocks	<ul style="list-style-type: none">▪ I can compare and group together different kinds of rocks (granite, sandstone, limestone, slate, basalt, marble, gabbro) based on their appearance and simple physical properties (smooth/rough, shiny/dull, grains or crystals, heavy/light, sharp, flat, round or jagged)▪ I can investigate what changes occur when rocks are added to water.▪ I can recognise soils are made from rocks and organic matter▪ I can describe in simple terms how fossils are formed when things that have lived are trapped within rocks.▪ I can research how fossils are excavated.▪ I can explain who Mary Anning was. <p><i>Children should be given the opportunity to explore different kinds of rocks and soils in the local environment.</i></p> <p><i>Rocks that are available in the local environment; granite – Cheviot Hills (links to Geography), coal (mining links), sandstone (used in building towns and monuments such as Grey Street in Newcastle, Hadrian's Wall and Alnwick Castle), limestone (Northumberland)</i></p>			
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SCIENCE- Knowledge and Key Skills#



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Electricity	<ul style="list-style-type: none">▪ I can identify common electrical appliances.▪ I can construct a simple series electrical circuit and identify its basic parts, including cells, wires, bulbs, switches and buzzers.▪ I can identify whether or not a lamp will light in a simple series circuit, based on whether the lamp is part of a complete loop with a battery.▪ I can recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit.▪ I can investigate what happens to bulbs if more cells are added.▪ I can recognise some common conductors and insulators and associate metals with being good conductors. <p><i>NB Pupils should draw the circuit as a pictorial representation, but should not necessarily use conventional circuit symbols at this stage. These will be introduced in Year 6. Pupils might use the terms current and voltage but these should not be introduced or defined formally at this stage. Pupils should be taught about precautions for working safely with electricity throughout.</i></p>	<ul style="list-style-type: none">▪ I can describe the function of electrical components and draw a simple circuit using their symbols.▪ I can construct a simple series circuit and explain what happens when I try different components e.g. switches, bulbs, buzzers and motors.▪ I can associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit.▪ I can 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.▪ I can design and make a Steady Hand Game (DT link).▪ I can explore the history of electricity (Benjamin Franklin, Alessandro Volta, Joseph Swan (<i>local scientist</i>), Thomas Edison and Lewis Latimer) <p><i>NB Pupils are only expected to learn about series circuits, not parallel circuits.</i></p>
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<p>Living things and their habitats</p>		<ul style="list-style-type: none"> I can recognise that living things can be grouped in a variety of ways (invertebrates, vertebrates, flowering and non-flowering plants, also include vertebrate groups – e.g. fish, amphibians, reptiles, birds and mammals and invertebrates such as snails and slugs, worms, spiders and insects) I can explore and use classification keys to help group, identify and name a variety of living things in my local and wider environment. I can recognise that environments can change and that this can sometimes pose dangers to living things. I can explore examples of human impact, both positive and negative, on environments. Positive effects – nature reserves, ecologically planned parks or garden ponds. Negative effects – population, development, litter or deforestation. I can identify how habitats change throughout the year (this needs to be done throughout the year). 	<ul style="list-style-type: none"> I can describe the differences in the life cycle for a mammal, amphibians, insects and a bird. I can describe the life process of reproduction in plants and some animals. I can observe life cycle changes in a variety of living things, for example plants in the vegetable garden and animals in the local environment. I can observe and compare life cycles of plants and animals in their local environment with other plants and animals around the world (rainforest, ocean, desert areas and prehistoric times). I can ask questions and suggest reasons for similarities and differences of plants and animals around the world (rainforest, ocean, desert areas and prehistoric times). I can grow new plants from different parts of the parent plant (seeds, stem, root cuttings, tubas and bulbs). I can observe changes in an animal over a period of time (hatching and rearing chicks and comparing how different animals reproduce and grow). I can research about different types of reproduction including: sexual and asexual reproduction and plants and sexual reproduction in animals. I can research the work of naturalists and animal behaviourist for example David Attenborough and Jane Goodall. 	<ul style="list-style-type: none"> I can 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. I can give reasons for classifying plants and animals based on their specific characteristics. I can classify (through observations) animals into commonly found invertebrates (insects, spiders, snails, worms) and vertebrates (fish, amphibians, reptiles, birds and mammals). I can use classification systems and keys to identify some animals and plants in the immediate environment. I can research unfamiliar animals and plants from a broad range of other habitats and decide where they belong in the classification system. I can explain who Carl Linnaeus was and his importance for classification keys.
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Sound		<ul style="list-style-type: none"> ▪ I can identify how sounds are made and associate some of them with something vibrating. ▪ I can recognise that vibrations from sounds travel through a medium to the ear. ▪ I can find patterns between the pitch of a sound and features of the object that produced it. ▪ I can find patterns between the volume of a sound and the strength of the vibrations that produced it (e.g. saucepan lids of different sizes or elastic bands of different thicknesses). ▪ I can recognise how sounds get fainter as the distance from the sound source decreases. ▪ I can investigate which materials provide the best insulation against sound. (Ear muffs investigation) 		
Light	<ul style="list-style-type: none"> ▪ I can recognise that I need light in order to see things and dark is the absence of light ▪ I can observe that light is reflected from surfaces. ▪ I can research what happens when light reflects in a mirror or other reflective surfaces. (including playing mirror games to help them answer questions about how light behaves). ▪ I can recognise that light from the sun can be dangerous and there are ways to protect my eyes. (Note: pupils should be warned that it is not safe to look directly at the sun, even when wearing dark glasses). ▪ I can recognise that shadows are formed when the light from a light source is blocked by an opaque object. ▪ I can find patterns in the way that the sizes of shadows change. (They should look for, and measure, shadows, and find out how they are formed and what might cause the shadows to change). 			<ul style="list-style-type: none"> ▪ I can recognise that light appears to travel in straight lines. (deciding where to place rear-view mirrors on cars; designing and making a periscope and using the idea that light appears to travel in straight lines to explain how it works). ▪ I can use the idea that light travels in straight lines to explain that objects are seen because they give out light or reflect light into the eye. ▪ I can explain that we can see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes. ▪ I can use the idea that light travels in straight lines to explain why shadows have the same shapes as the objects that cast them. ▪ I can investigate the relationship between light sources, objects and shadows using shadow puppets. ▪ I can extend my experience of light by looking at a range of phenomena (including rainbows, colours on soap bubbles, objects looking bent in water and coloured filters. They do not need to explain why these phenomena occur.)

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Forces and magnets	<ul style="list-style-type: none"> I can compare how far things move on different surfaces e.g. smooth, rough, bumpy I can notice that some forces need contact between 2 objects e.g. push and friction, but magnetic forces can act at a distance. I can describe magnets as having 2 poles and predict whether 2 magnets will attract or repel each other depending on which poles are facing. I can observe how magnets attract some materials and not others. I can compare and classify a variety of everyday materials based on whether they are attracted to a magnet and identify some magnetic materials. I can explore and compare the strength of different magnets. 		<ul style="list-style-type: none"> I can explain that unsupported objects fall towards the earth because of the force of gravity acting between the earth and the falling object. I can explore how scientists such as Galileo Galilei and Isaac Newton have helped to develop the theory of gravitation. I can explore the effects of friction on movement and find out how it slows or stops moving objects e.g. observing the effects of a brake on a bicycle wheel. I can explore the effects of air resistance by observing how different objects (such as parachutes) fall. I can explore resistance in water by making and testing boats of different shapes. I can recognise that some mechanisms including lever, pulleys and gears allow a smaller force to have a greater effect. 	
States of matter / Properties and changes of materials		<ul style="list-style-type: none"> I can compare and group materials together according to whether they are solids, liquids and gasses and I can develop simple descriptions of the states of matter (solids hold their shape, liquids form a pool not a pile and gasses escape from an unsealed container) I can observe that some materials change state when they are heated or cooled. (water as a solid, liquid and a gas) and I can measure or research the temperature at which this happens in degree Celsius. I can identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. I can explore the effect of temperature on substances (such as chocolate, butter and cream e.g. to make food such as chocolate crispy cakes and ice cream for a party) I can research the temperature at which materials change state (when iron melts or oxygen condenses into a liquid). I can investigate the effect of temperature on washing drying or snow / ice melting. 	<ul style="list-style-type: none"> I can 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. I can give reasons based on evidence from comparative and fair tests for the particular uses of every day materials including metals, wood and plastics, and why they are suitable for some purposes and not others. I can understand that some materials will dissolve in liquid to form a solution and describe how to recover a substance from a solution. I can use knowledge of solids, liquids and gasses to decide how mixtures might be separated (including filtering, sieving and evaporation) I can demonstrate that dissolving, mixing and changes of state are reversible changes. I can 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). 	



SCIENCE- Knowledge and Key Skills#



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Earth and Space			<ul style="list-style-type: none">▪ I can describe the movement of the earth and other planets relative to the sun in the solar system.▪ I can describe the Sun, Earth and Moon as approximately spherical bodies.▪ I can describe the movement of the moon relative to the earth (phases of the moon).▪ I can create a simple model of the solar system.▪ I can use the idea of the earth's rotation to explain day and night and the movement of sun across the sky.▪ I can explore how theories of Earth and Space have changed over time (Ptolemy, Alhazen and Copernicus).	
Evolution and Inheritance			<ul style="list-style-type: none">▪ I can recognise that living things have changed over time and that fossils provide information about living things that habited the earth millions of years ago.▪ I compare and contrast the skeletons of apes, humans, and Neanderthals.▪ I can recognise that living things produce offspring of the same kind but normally off spring vary and are not identical to their parents.▪ I can consider different breeds of dogs and what happens when Labradors are crossed with poodles.▪ I can identify how animals and plants have adapted to suit their environment in different ways and that adaptation may lead to evolution.▪ I can explain how some living things have adapted to survive in extreme conditions. Eg. Cactus, penguins, and camels.▪ I can explain the development of insulting fur in the artic fox.▪ I can explain who Charles Darwin was and his theories of evolution.	