

Grayrigg CE Primary School Skill Progression for Science: The skill progression enables us to ensure progress through each phase of the National Curriculum.

In order to ensure we deliver all a variety of topics we follow a rolling programme. In Ks2 this is a 4 year rolling program.

	Year 1	Year 2	Year3	Year 4	Year 5	Year 6
Planning and Communication and Sources	<p>draw simple pictures</p> <p>talk about what they see and do</p> <p>use simple charts to communicate findings</p> <p>identify key features ask questions</p>	<p>describe their observations using some scientific vocabulary</p> <p>use a range of simple texts to find information</p> <p>suggest how to find things out</p> <p>identify key features ask questions</p>	<p>use pictures, writing, diagrams and tables as directed by their teacher</p> <p>use simple texts, directed by the teacher, to find information</p> <p>record their observations in written, pictorial and diagrammatic forms</p> <p>select the appropriate format to record their observations</p>	<p>record observations, comparisons and measurements using tables and bar charts</p> <p>begin to plot points to form a simple graph use graphs to point out and interpret patterns in their data</p> <p>select information from a range of sources provided for them</p>	<p>record observations systematically</p> <p>use appropriate scientific language and conventions to communicate quantitative and qualitative data</p> <p>select a range of appropriate sources of information including books, internet</p>	<p>choose scales for graphs which show data and features effectively</p> <p>identify measurements and observations which do not fit into the main pattern</p> <p>begin to explain anomalous data</p> <p>use appropriate ways to communicate quantitative data using scientific language</p>
Enquiring and Testing and Obtaining and Presenting Evidence	<p>test ideas suggested to them say what they think will happen</p> <p>use first hand experiences to answer questions</p> <p>begin to compare objects and living things</p>	<p>use simple equipment provided to aid observation</p> <p>compare objects, living things or events</p> <p>make observations relevant to their task</p> <p>begin to recognise when a test or comparison is unfair</p> <p>use first hand experiences to answer questions</p>	<p>put forward own ideas about how to find the answers to questions</p> <p>recognise the need to collect data to answer questions</p> <p>carry out a fair test with support recognise and explain why it is a fair test</p> <p>with help, begin to realise that scientific ideas are based on evidence</p>	<p>with help, pupils begin to realise that scientific ideas are based on evidence</p> <p>show in the way they perform their tasks how to vary one factor while keeping others the same</p> <p>decide on an appropriate approach in their own investigations to answer questions</p> <p>describe which factors they are varying and which will remain the same and say why</p>	<p>use previous knowledge and experience combined with experimental evidence to provide scientific explanations</p> <p>recognise the key factors to be considered in carrying out a fair test</p>	<p>describe evidence for a scientific idea</p> <p>use scientific knowledge to identify an approach for an investigation</p> <p>explain how the interpretation leads to new ideas</p>

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Observing and Recording	<p>make observations using appropriate senses</p> <p>record observations</p> <p>communicate observations orally, in drawing, labelling, simple writing and using ICT</p>	<p>respond to questions asked by the teacher</p> <p>ask questions collect and record data (supported by the teacher)</p> <p>suggest how they could collect data to answer questions</p> <p>begin to select equipment from a limited range</p>	<p>make relevant observations</p> <p>measure using given equipment</p> <p>select equipment from a limited range</p>	<p>carry out measurement accurately</p> <p>make a series of observations, comparisons and measurements</p> <p>select and use suitable equipment</p> <p>make a series of observations and measurements adequate for the task</p>	<p>make a series of observations, comparisons and measurements with increasing precision</p> <p>select apparatus for a range of tasks plan to</p> <p>use apparatus effectively begin to make repeat observations and measurements</p> <p>measure quantities with precision using fine – scale divisions select and use information effectively</p> <p>make enough measurements or observations for the required task range systematically</p>	<p>measure quantities with precision using fine – scale divisions</p> <p>select and use information effectively</p> <p>make enough measurements or observations for the required task</p>
Considering Evidence and Evaluating	<p>make simple comparisons and groupings</p> <p>say what has happened</p> <p>say whether what has happened was what they expected</p>	<p>say what has happened</p> <p>say what their observations show and whether it was what they expected</p> <p>begin to draw simple conclusions and explain what they did</p> <p>begin to suggest improvements in their work</p>	<p>begin to offer explanations for what they see and communicate in a scientific way what they have found out</p> <p>begin to identify patterns in recorded measurements</p> <p>suggest improvements in their work</p> <p>evaluate their findings</p>	<p>predict outcomes using previous experience and knowledge and compare with actual results</p> <p>begin to relate their conclusions to scientific knowledge and understanding</p> <p>suggest improvements in their work, giving reasons</p>	<p>make predictions based on their scientific knowledge and understanding</p> <p>draw conclusions that are consistent with the evidence</p> <p>relate evidence to scientific knowledge and understanding</p> <p>offer simple explanations for any differences in their results</p> <p>make practical suggestions about how their working methods could be improved</p>	<p>make reasoned suggestions on how to improve working methods</p> <p>show how interpretation of evidence leads to new ideas</p> <p>explain conclusions, showing understanding of scientific ideas</p>

KS1	Autumn	Spring	Summer	On-going
A	<p>Materials: Why is this made out of that?</p> <ul style="list-style-type: none"> Can they distinguish between an object and the material from which it is made? 	<p>Animals including humans (explore different animals and life cycles over the two years)</p>	<p>Plants</p> <p>Focus on school garden work</p> <ul style="list-style-type: none"> Can they name the petals, stem, leaf, bulb, flower, 	<p>Seasonal change</p> <ul style="list-style-type: none"> Can they observe changes across the four

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	<ul style="list-style-type: none"> Can they describe materials using their senses? Can they describe materials using their senses, using specific scientific words? Can they explain what material objects are made from? Can they explain why a material might be useful for a specific job? Can they name some different everyday materials? e.g. wood, plastic, metal, water and rock Can they sort materials into groups by a given criteria? Can they describe the simple physical properties of a variety of everyday materials? Can they compare and group together a variety of materials based on their simple physical properties? Can they describe the properties of different materials using words like, transparent or opaque, flexible, etc.? Can they sort materials into groups and say why they have sorted them in that way? Can they say which materials are natural and which are man-made? 	<ul style="list-style-type: none"> Can they point out some of the differences between different animals? Can they sort photographs of living things and non-living things? Can they identify and name a variety of common animals? (birds, fish, amphibians, reptiles, mammals, invertebrates) Can they describe how an animal is suited to its environment? Can they identify and name a variety of common animals that are carnivores, herbivores and omnivores? Can they name the parts of the human body that they can see? Can they draw & label basic parts of the human body? Can they identify the main parts of the human body and link them to their senses? Can they name the parts of an animal's body? Can they name a range of domestic animals? Can they classify animals by what they eat? (carnivore, herbivore, omnivore) Can they compare the bodies of different animals? Can they describe what animals need to survive? Can they explain that animals grow and reproduce? Can they explain why animals have offspring which grow into adults? Can they describe the life cycle of some living things? (e.g. egg, chick, chicken) Can they explain the basic needs of animals, including humans for survival? (water, food, air) Can they describe why exercise, balanced diet and hygiene are important for humans? Can they explain that animals reproduce in different ways? 	<p>seed, stem and root of a plant?</p> <ul style="list-style-type: none"> Can they identify and name a range of common plants and trees? Can they recognise deciduous and evergreen trees? Can they name the trunk, branches and root of a tree? Can they describe the parts of a plant (roots, stem, leaves, flowers)? Can they describe what plants need to survive? Can they observe and describe how seeds and bulbs grow into mature plants? Can they find out & describe how plants need water, light and a suitable temperature to grow and stay healthy? Can they describe what plants need to survive and link it to where they are found? <ul style="list-style-type: none"> Can they explain that plants grow and reproduce in different ways? 	<p>seasons?</p> <ul style="list-style-type: none"> Can they name the four seasons in order? Can they observe and describe weather associated with the seasons? Can they observe and describe how day length varies? Can they observe features in the environment and explain that these are related to a specific season? Can they observe and talk about changes in the weather? Can they talk about weather variation in different parts of the world? 		
B	<p>Living things and their habitats Mini beasts and woodland creatures- hibernation.</p> <ul style="list-style-type: none"> Can they match certain living things to the habitats they are found in? Can they explain the differences between living and non-living things? Can they describe some of the life processes common to plants and animals, including humans? Can they decide whether something is living, dead or non-living? Can they describe how a habitat provides for the basic needs of things living there? Can they describe a range of different habitats? Can they describe how plants and animals are suited to their habitat? Can they name some characteristics of an animal that help it to live in a particular habitat? Can they describe what animals need to survive and link this to their habitats? 	<ul style="list-style-type: none"> Can they describe what animals need to survive? Can they explain that animals grow and reproduce? Can they explain why animals have offspring which grow into adults? Can they describe the life cycle of some living things? (e.g. egg, chick, chicken) Can they explain the basic needs of animals, including humans for survival? (water, food, air) Can they describe why exercise, balanced diet and hygiene are important for humans? Can they explain that animals reproduce in different ways? 	<p>Changing Materials</p> <ul style="list-style-type: none"> Can they explain how solid shapes can be changed by squashing, bending, twisting and stretching? Can they explore how the shapes of solid objects can be changed? (squashing, bending, twisting, stretching) Can they find out about people who developed useful new materials? (John Dunlop, Charles Macintosh, John McAdam) Can they identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper, cardboard for particular uses? Can they explain how things move on different surfaces? Can they explain how materials are changed by heating and cooling? Can they explain how materials are changed by bending, twisting and stretching? <p>Can they tell which materials cannot be changed back after being heated, cooled, bent, stretched or twisted?</p>			
KS2	Autumn 1: Human Biology	Autumn 2	Spring 1	Spring 2:	S1	Summer 2

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A	<p>Circulatory system Can they describe how nutrients, water and oxygen are transported within animals and humans? Can they identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood? Can they recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function?</p>	<p>States of matter Can they compare and group materials together, according to whether they are solids, liquids or gases? Can they explain what happens to materials when they are heated or cooled? Can they measure or research the temperature at which different materials change state in degrees Celsius? Can they use measurements to explain changes to the state of water? Can they identify the part that evaporation and condensation has in the water cycle? Can they associate the rate of evaporation with temperature? Can they group and classify a variety of materials according to the impact of temperature on them? Can they explain what happens over time to materials such as puddles on the playground or washing hanging on a line? Can they relate temperature to change of state of materials?</p>	<p>Light Can they recognise that they need light in order to see things? Can they recognise that dark is the absence of light? Can they notice that light is reflected from surfaces? Can they recognise that light from the sun can be dangerous and that there are ways to protect their eyes? Can they recognise that shadows are formed when the light from a light source is blocked by a solid object? Can they find patterns in the way that the size of shadows change? Can they explain why lights need to be bright or dimmer according to need? Can they explain the difference between transparent, translucent and opaque? Can they explain why lights need to be bright or dimmer according to need? Can they make a bulb go on and off? Can they say what happens to the electricity when more batteries are added? Can they explain why their shadow changes when the light source is moved closer or further from the object? Can they recognise that light appears to travel in straight lines? Can they 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? Can they 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? Can they 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>Plants Can they identify and describe the functions of different parts of flowering plants? (roots, stem/trunk, leaves and flowers)? Can they explore the requirement of plants for life and growth (air, light, water, nutrients from soil, and room to grow)? Can they explain how they vary from plant to plant? Can they investigate the way in which water is transported within plants? Can they explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal?</p>	<p>Scientists Aerodynamics- paper aeroplanes</p>	<p>Evolution Can they recognise that living things have changed over time and that fossils provide information about living things that inhabited the earth millions of years ago? Can they explain the process of evolution and describe the evidence for this? Can they identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution? Can they talk about the work of Charles Darwin, Mary Anning and Alfred Wallace? Can they explain how some living things adapt to survive in extreme conditions? Can they analyse the advantages and disadvantages of specific adaptations, such as being on two rather than four feet?</p>
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<p>B</p>	<p>Digestive system Can they explain the importance of a nutritionally balanced diet? Can they identify that animals, including humans, cannot make their own food: they get nutrition from what they eat? Can they identify and name the basic parts of the digestive system in humans? Can they describe the simple functions of the basic parts of the digestive system in humans? Can they identify the simple function of different types of teeth in humans? Can they compare the teeth of herbivores and carnivores? Can they explain what a simple food chain shows? Can they construct and interpret a variety of food chains, identifying producers, predators and prey?</p>	<p>Compare and group Materials Can they compare and group together everyday materials on the basis of their properties, including hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets? Can they explain how some materials dissolve in liquid to form a solution? Can they describe how to recover a substance from a solution? Can they use their knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving, evaporating? Can they give reasons, based on evidence for comparative and fair tests for the particular uses of everyday materials, including metals wood and plastic? Can they describe changes using scientific words? (evaporation, condensation) Can they demonstrate that dissolving, mixing and changes of state are reversible changes? Can they 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? Can they use the terms 'reversible' and 'irreversible'? Can they describe methods for separating mixtures? (filtration, distillation) Can they work out which materials are most effective for keeping us warm or for keeping something cold? Can they use their knowledge of materials to suggest ways to classify? (solids, liquids, gases) Can they explore changes that are difficult to reverse, e.g. burning, rusting and reactions such as vinegar with bicarbonate of soda? Can they explore the work of chemists who created new materials, e.g. Spencer Silver (glue on sticky notes) or Ruth Benerito (wrinkle free cotton)?</p>	<p>Forces and magnets Can they compare how things move on different surfaces? Can they observe that magnetic forces can be transmitted without direct contact? Can they observe how some magnets attract or repel each other? Can they classify which materials are attracted to magnets and which are not? Can they notice that some forces need contact between two objects, but magnetic forces can act at a distance? Can they compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet? Can they identify some magnetic materials? Can they describe magnets have having two poles (N & S)? Can they predict whether two magnets will attract or repel each other depending on which poles are facing?</p>	<p>Living things and their environment Can they recognise that living things can be grouped in a variety of ways? Can they explore and use a classification key to group, identify and name a variety of living things? (plants, vertebrates, invertebrates) Can they compare the classification of common plants and animals to living things found in other places? (under the sea, prehistoric) Do they recognise that environments can change and this can sometimes pose a danger to living things? Can they give reasons for how they have classified animals and plants, using their characteristics and how they are suited to their environment? Can they explore the work of pioneers in classification? (e.g. Carl Linnaeus) Can they name and group a variety of living things based on feeding patterns? (producer, consumer, predator, prey, herbivore, carnivore, omnivore)</p>	<p style="text-align: center;">Scientists Bubbles</p>	<p>Forces Focus Water- resistance and Archimedes Forces: focus gravity Can they explain that unsupported objects fall towards the earth because of the force of gravity acting between the earth and the falling object? Can they identify the effects of air resistance, water resistance and friction that act between moving surfaces? Can they recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect? Can they describe and explain how motion is affected by forces? (including gravitational attractions, magnetic attraction and friction) Can they design very effective parachutes? Can they work out how water can cause resistance to floating objects? Can they explore how scientists, such as Galileo Galilei and Isaac Newton helped to develop the theory of gravitation?</p>
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C	<p>Respiratory system Can they describe how nutrients, water and oxygen are transported within animals and humans?</p>	<p>Earth And the Solar System Can they identify and explain the movement of the Earth and other planets relative to the sun in the solar system? Can they explain how seasons and the associated weather is created? Can they describe and explain the movement of the Moon relative to the Earth? Can they describe the sun, earth and moon as approximately spherical bodies? Can they use the idea of the earth's rotation to explain day and night and the apparent movement of the sun across the sky? Can they compare the time of day at different places on the earth? Can they create shadow clocks? Can they begin to understand how older civilizations used the sun to create astronomical clocks, e.g. Stonehenge? Can they explore the work of some scientists? (Ptolemy, Alhazen, Copernicus)</p>	<p>Sound Can they describe a range of sounds and explain how they are made? Can they associate some sounds with something vibrating? Can they compare sources of sound and explain how the sounds differ? Can they explain how to change a sound (louder/softer)? Can they recognise how vibrations from sound travel through a medium to an ear? Can they find patterns between the pitch of a sound and features of the object that produce it? Can they find patterns between the volume of the sound and the strength of the vibrations that produced it? Can they recognise that sounds get fainter as the distance from the sound source increases? Can they explain how you could change the pitch of a sound? Can they investigate how different materials can affect the pitch and volume of sounds? Can they explain why sound gets fainter or louder according to the distance? Can they explain how pitch and volume can be changed in a variety of ways? Can they work out which materials give the best insulation for sound?</p>	<p>Rocks Can they compare and group together different rocks on the basis of their appearance and simple physical properties? Can they describe and explain how different rocks can be useful to us? Can they describe and explain the differences between sedimentary and igneous rocks, considering the way they are formed? Can they describe in simple terms how fossils are formed when things that have lived are trapped within rock? Can they recognise that soils are made from rocks and organic matter? Can they classify igneous and sedimentary rocks? Can they begin to relate the properties of rocks with their uses?</p>	<p>Scientists Bridge structure</p>	<p>Evolution Can they recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents? Can they give reasons why offspring are not identical to each other or to their parents? Can they begin to understand what is meant by DNA?</p>
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D	<p>Skeleton and Muscles</p> <p>Can they describe and explain the skeletal system of a human? Can they describe and explain the muscular system of a human?</p>	<p>Forces: focus gravity</p> <p>Can they explain that unsupported objects fall towards the earth because of the force of gravity acting between the earth and the falling object? Can they identify the effects of air resistance, water resistance and friction that act between moving surfaces? Can they recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect? Can they design very effective parachutes? Can they explore how scientists, such as Galileo Galilei and Isaac Newton helped to develop the theory of gravitation?</p>	<p>Electricity</p> <p>Can they identify common appliances that run on electricity? Can they construct a simple series electric circuit? Can they identify and name the basic part in a series circuit, including cells, wires, bulbs, switches and buzzers? Can they 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? Can they recognise that a switch opens and closes a circuit? Can they associate a switch opening with whether or not a lamp lights in a simple series circuit? Can they recognise some common conductors and insulators? Can they associate metals with being good conductors? Can they explain how a bulb might get lighter? Can they recognise if all metals are conductors of electricity? Can they work out which metals can be used to connect across a gap in a circuit? Can they explain why cautions are necessary for working safely with electricity? Can they identify and name the basic parts of a simple electric series circuit? (cells, wires, bulbs, switches, buzzers) Can they compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers, the on/off position of switches? Can they use recognised symbols when representing a simple circuit in a diagram?</p>	<p>Living things and their environment</p> <p>Can they describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird? Can they describe the life cycles of common plants? Can they explore the work of well known naturalists and animal behaviourists? (David Attenborough and Jane Goodall) Can they observe their local environment and draw conclusions about life-cycles, e.g. plants in the vegetable garden or flower border? Can they compare the life cycles of plants and animals in their local environment with the life cycles of those around the world, e.g. rainforests?</p>	<p>Scientists Lifting things (shadufs)</p>	<p>Plants School garden development focus</p>
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