College Road Primary School - Science skills and knowledge progression

Foundation Stage - Knowledge and Understanding of the World

- Look closely at similarities, differences, patterns and change
- Talk about similarities and differences in relation to places, objects, materials and living things
- Make observations of animals and plants and show care and concern for living things in the environment.
- Explain why some things occur, how things work and talk about changes.

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Working Scientifically Pupils will be taught to use the following practical scientific methods, processes and skills:	WS1 asking simple questions and recognising that they can be answered in different ways WS2 observing closely, using simple equipment and measurement WS3 performing simple tests WS4 identifying and classifying WS5 using their observations and ideas to suggest answers to questions WS6 gathering, recording and communicating data and findings to help in answering questions. WS7 use scientific language and read and spell age-appropriate scientific vocabulary WS8 begin to notice patterns and relationships.	WS1 asking simple questions and recognising that they can be answered in different ways WS2 observing closely, using simple equipment and measurement WS3 performing simple tests WS4 identifying and classifying WS5 using their observations and ideas to suggest answers to questions WS6 gathering, recording and communicating data and findings to help in answering questions. WS7 use scientific language and read and spell age-appropriate scientific vocabulary WS8 begin to notice patterns and relationships.	WS1 making decisions, asking relevant questions and using different types of scientific enquiries to answer them WS2 setting up simple practical enquiries, comparative and fair tests WS3 making systematic and careful observations using notes and simple tables WS4 taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers WS5 gathering, recording, classifying and presenting data in a variety of ways to help in answering questions WS6 recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables WS7 reporting on findings from enquiries, using relevant scientific language, including oral and written explanations, displays or presentations of results and conclusions WS8 using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions WS9 identifying differences, patterns, similarities or changes related to simple scientific ideas and processes WS10 using straightforward scientific evidence to answer questions or to support their findings. WS11 begin to look for naturally occurring patterns and relationships WS12 recognise when and how secondary sources might help	WS1 making decisions, asking relevant questions and using different types of scientific enquiries to answer them WS2 setting up simple practical enquiries, comparative and fair tests WS3 making systematic and careful observations using notes and simple tables WS4 taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers WS5 gathering, recording, classifying and presenting data in a variety of ways to help in answering questions WS6 recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables WS7 reporting on findings from enquiries, using relevant scientific language, including oral and written explanations, displays or presentations of results and conclusions WS8 using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions WS9 identifying differences, patterns, similarities or changes related to simple scientific ideas and processes WS10 using straightforward scientific evidence to answer questions or to support their findings. WS11 begin to look for naturally occurring patterns and relationships WS12 recognise when and how secondary sources might help	WS1 planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary WS2 taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate WS3 recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs WS4 using test results to make predictions to set up further comparative and fair tests WS5 reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations WS6 identifying scientific evidence that has been used to support or refute ideas or arguments. WS7 explore and talk about their ideas; asking their own questions about scientific phenomena; and analysing functions, relationships and interactions more systematically. WS8 recognise that scientific ideas change and develop over time. WS9 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. WS10 Pupils should read, spell and pronounce scientific vocabulary correctly.	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Plants	P1 identify and name a variety of common wild and garden plants, including deciduous and evergreen trees P2 identify and describe the basic structure of a variety of common flowering plants, including trees.	P1 observe and describe how seeds and bulbs grow into mature plants P2 find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.	P1 identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers P2 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 P3 investigate the way in which water is transported within plants P4 explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. P5 know that plants make their own food	P1 Explore the role plants play as producers in food chains P2 recognise that plants can be grouped into flowering plants and non-flowering plants P3 name examples of flowering plants P4 name examples of non-flowering plants P5 use a classification key to identify plants found in their local environment		
Animals including humans	AH1 identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals AH2 identify and name a variety of common animals that are carnivores, herbivores and omnivores AH3 describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets) AH4 identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.	AH1 notice that animals, including humans, have offspring which grow into adults AH2 find out about and describe the basic needs of animals, including humans, for survival (water, food and air) AH3 describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene	AH1 identify that animals, including humans, need the right types and amount of nutrition, and that they AH2 cannot make their own food; they get nutrition from what they eat AH3 identify that humans and some animals have skeletons and muscles for support, protection and movement.	AH1 describe the simple functions of the basic parts of the digestive system in humans AH2 compare the human digestive system to an animal AH3 identify the different types of teeth in humans and their simple functions AH4 compare human teeth to an animal's teeth or herbivores to carnivores AH5 construct and interpret a variety of food chains, identifying producers, predators and prey	AIH1describe the changes as humans develop to old age. AIH2 draw a timeline to indicate stages in the growth and development of humans. AIH3 learn about the changes experienced in puberty.	AIH1 identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood AIH2 recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function AIH3 describe the ways in which nutrients and water are transported within animals, including humans. AIH4 explore questions to understand how the circulatory system enables the body to function. AIH5 learn how to keep their bodies healthy and how their bodies might be damaged – including how some drugs and other substances can be harmful to the human body.
Living things and their habitats		LH1 explore and compare the differences between things that are living, dead, and things that have never been alive LH2 identify that most living things live in habitats to which they are suited LH3 describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other LH4 identify and name a variety of plants and animals in their habitats, including micro-habitats LH5 describe how animals obtain their food from plants and other animals		LH1 recognise that living things (including those in the locality) can be grouped in a variety of ways LH2 explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment LH3 recognise that environments can change and that this can sometimes pose dangers to living things.	LT1 describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird LT2 describe the life process of reproduction in some plants and animals. LT3 raise questions about their local environment throughout the year. LT4 find out about the work of naturalists and animal behaviourists, for example, David Attenborough and Jane Goodall. LT5 find out about different types of reproduction, including sexual and asexual reproduction in plants, and sexual reproduction in animals.	LTH1 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 LTH2 give reasons for classifying plants and animals based on specific characteristics. LTH3 know that broad groupings, such as micro-organisms, plants and animals can be subdivided. LTH4 should classify animals into commonly found invertebrates (such as insects, spiders, snails, worms) and vertebrates (fish, amphibians, reptiles, birds and mammals).

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		LH6 understand a simple food chain, and identify and name different sources of food.				LTH5 find out about significance of the work of scientists such as Carl Linnaeus, a pioneer of classification.
(Key Stage 1) **E**veryday **M**aterials and their uses (Key Stage 2) **S**tates of **M**atter **P**roperties and Changes of **M**aterials	EM1 distinguish between an object and the material from which it is made EM2 identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock EM3 describe the simple physical properties of a variety of everyday materials EM4 compare and group together a variety of everyday materials on the basis of their simple physical properties.	EM1 identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses EM2 find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.		SM1 explore a variety of everyday materials and develop simple descriptions of the states of matter SM2 compare and group materials together, according to whether they are solids, liquids or gases SM3 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) SM4 identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature	PM1 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 PM2 know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution PM3 use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating PM4 give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic PM5 demonstrate that dissolving, mixing and changes of state are reversible changes PM6 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. PM7 explore reversible changes, including, evaporating, filtering, sieving, melting and dissolving, recognising that melting and dissolving are different processes. PM8 explore changes that are difficult to reverse, for example, burning, rusting and other reactions, for example, vinegar with bicarbonate of soda	
Seasonal Changes	SC1 observe changes across the four seasons SC2 observe and describe weather associated with the seasons and how day length varies.					
Sound				S1 identify how sounds are made, associating some of them with something vibrating S2 recognise that vibrations from sounds travel through a medium to the ear S3 find patterns between the pitch of a sound and features of the object that produced it		

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				S4 find patterns between the volume of a sound and the strength of the vibrations that produced it S5 recognise that sounds get fainter as the distance from the sound source increases		
Light			L1 recognise that they need light in order to see things and that dark is the absence of light L2 notice that light is reflected from surfaces L3 recognise that light from the sun can be dangerous and that there are ways to protect their eyes L4 recognise that shadows are formed when the light from a light source is blocked by a solid object L5 find patterns in the way that the size of shadows change			L1 recognise that light appears to travel in straight lines L2 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 L3 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 L4 use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. L5 work scientifically by: 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. L6 look 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).
Forces and Magnets			FM1 compare how things move on different surfaces FM2 notice that some forces need contact between two objects, but magnetic forces can act at a distance FM3 observe how magnets attract or repel each other and attract some materials and not others FM4 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 FM5 describe magnets as having two poles FM6 predict whether two magnets will attract or repel each other, depending on which poles are facing.		F1 explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object F2 identify the effects of air resistance, water resistance and friction, that act between moving surfaces F3 recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. F4 explore the effects of air resistance by observing how different objects such as parachutes and sycamore seeds fall. F5 explore the effects of friction on movement and find out how it slows or stops moving objects. F6 find out how scientists, for example, Galileo Galilei and Isaac Newton helped to develop the theory of gravitation.	
Rocks			R1 compare and group together different kinds of rocks (including those in the locality) on the basis			

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			of appearance and simple physical properties R2 describe in simple terms how fossils are formed when things that have lived are trapped within rock R3 recognise that soils are made from rocks and organic matter.			
Electricity				E1 identify common appliances that run on electricity E2 construct a simple series circuit, identifying/naming its basic parts, including cell, wire, bulb, switch and buzzer E3 use their circuits to create simple devices E4 draw the circuit as a pictorial representation (not necessarily using conventional circuit symbols) E5 about precautions for working safely with electricity. E6 identify whether or not a lamp will light in a simple series circuit/ E7 recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit E8 recognise some common conductors and insulators, and associate metals with being good conductors.		E1 associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit E2 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 E3 use recognised symbols when representing a simple circuit in a diagram. E4 construct simple series circuits, to help them to answer questions about what happens when they try different components, for example, switches, bulbs, buzzers and motors. E5 learn how to represent a simple circuit in a diagram using recognised symbols.
Earth and Space					ES1 describe the movement of the Earth, and other planets, relative to the Sun in the solar system ES2 describe the movement of the Moon relative to the Earth ES3 describe the Sun, Earth and Moon as approximately spherical bodies ES4 use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky. ES5 learn that the Sun is a star at the centre of our solar system and that it has eight planets: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune (Pluto was reclassified as a 'dwarf planet' in 2006). ES6 understand that a moon is a celestial body that orbits a planet (Earth has one moon; Jupiter has four large moons and numerous smaller ones).	
Evolution and inheritance						EI1 recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago EI2 recognise that living things produce offspring of the same kind, but

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						normally offspring vary and are not identical to their parents EI3 identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution. EI4 be introduced to the idea that characteristics are passed from parents to their offspring, i.e. different breeds of dogs, and what happens when, for example, labradors are crossed with poodles. EI5 appreciate that variation in offspring over time can make animals more or less able to survive in particular environments, for example, by exploring how giraffes' necks got longer. EI6 find out about the work of palaeontologists such as Mary Anning and about how Charles Darwin and Alfred Wallace developed their ideas on evolution.
Vocabulary						