



St Cuthbert's Junior School

Knowledge and Skills Progression in Science



Scientific Enquiry Skills and Vocabulary					
	Key Stage 1	Lower Key Stage 2		Upper Key Stage 2	
	Year 2	Year 3	Year 4	Year 5	Year 6
Plan	Ask simple questions when prompted. Recognise that questions can be answered in different ways.	Ask relevant questions when prompted Use different types of scientific enquiry to answer them. Set up simple and practical enquiries, comparative and fair tests with some support.	Ask relevant questions. Use different types of scientific enquiries to answer their questions Set up simple and practical enquiries, comparative and fair tests	Plan different types of scientific enquiries to answer questions. With prompting, recognise and control variables where necessary	Plan different types of scientific enquiries to answer questions Recognise and control variables where necessary
Do	Observe closely, using simple equipment Perform simple tests Identify and classify	Make systematic and careful observations, using simple equipment Use standard units when taking measurements	Make systematic and careful observations using a range of equipment, including thermometers and data loggers Take accurate measurements using standard units, where appropriate	Select, with prompting, and use appropriate equipment to take readings Take precise measurements using standard units Begin to understand the need for repeat readings	Use a range of scientific equipment to take measurements Take measurements with increasing accuracy and precision Take repeat readings when appropriate
Record	Record and communicate their findings in a range of ways and begin to use simple scientific language Gather and record data to help answer questions	With modelling and guidance, gather, record, classify and present data in a variety of ways to help to answer questions. With prompting, use various ways of recording, grouping and displaying evidence and suggest how findings may be tabulated	Gather, record, classify and present data in a variety of ways to help to answer questions Record findings using simple scientific language, drawings and labelled diagrams Record findings using keys, bar charts, and tables	Take and process repeat readings Record data and results Record data using labelled diagrams, keys, tables and charts Use line graphs to record data	Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, bar charts and line graphs
Review	Use their observations and ideas to suggest answers to simple questions	With prompting, suggest conclusions from enquiries Suggest how findings could be reported	Report on findings from enquiries, including oral and written explanations, of results and conclusions	Report and present findings from enquiries, including conclusions and, with prompting, suggest causal relationships	Report and present findings from enquiries, including conclusions and causal relationships



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Vocabulary	Questions, answers, equipment, measure, record, results, sort, group, test, explore, observe changes over time, compare, notice patterns, describe, similar/ities, different/ces, classify, data, beaker, pipette, syringe, timer	Previous vocab plus scientific enquiry changes over time, notice patterns, secondary sources, comparative tests, fair tests, careful, accurate, observations, equipment, gather, measure, record, data, evidence, results, keys, bar charts, table, results, conclusions, predictions, support, thermometers	Previous vocab plus enquiry types increase, decrease, identify, classify, order, notice patterns, relationships, appearance, present results, data loggers	Previous vocab plus, notice patterns, relationships, independent variable, dependent variable, controlled variable, accuracy, precision, degree of trust, classification keys, scatter graphs, line graphs, causal relationships, support/refute	Previous vocab plus opinion/fact, confidently name scientific enquiry types



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Animals Including Humans	Know that animals, including humans, have offspring which grow into adults Know and describe the basic needs of animals, including humans, for survival (water, food and air) Know and describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.	Identify and know animals, including humans, need the right types and amount of nutrition, that they cannot make their own food; they get nutrition from what they eat. Identify and know that humans and some animals have skeletons and muscles for support, protection and movement.	Describe the simple functions of the basic parts of the digestive system in humans. Identify the different types of teeth in humans and their simple functions. Construct and interpret a variety of food chains, identifying producers; predators and prey.	Describe the changes, as humans develop to old age.	Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. Describe the ways in which nutrients and water are transported within animals, including humans.



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Vocabulary Animals inc. Humans	Survival, Water, Air, Food, Adult, Baby, Offspring, Kitten, Calf, Puppy, Exercise, Hygiene	Movement, Muscles, Bones, Skull, Nutrition, Skeletons, protection	Mouth, Tongue, Teeth, Oesophagus, Stomach, Small Intestine, Large Intestine, Herbivore, Carnivore, Canine, Incisor, Molar	Foetus, Embryo, Womb, Gestation, Baby, Toddler, Teenager, Elderly, Growth, Development, Puberty, Reproduction, Sexual, Asexual, Germination, Pollination, Birth, Fertilisation, Menstrual cycle	Circulatory, Heart, Blood Vessels, Veins, Arteries, Oxygenated, Pulmonary Deoxygenated, Valve, Exercise, Respiration, Diaphragm, Bronchi, plasma
Living Things and their habitats	Explore and compare the differences between things that are living, dead, and things that have never been alive. 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. Identify and name a variety of plants and animals in their		Identify and name a variety of living things (plants and animals) in the local and wider environment. Give reasons for classifying plants and animals based on specific characteristics. Recognise that environments are constantly changing and that this can sometimes pose dangers to specific habitats.	Know and describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.	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. Give reasons for classifying plants and animals based on specific characteristics.



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	habitats, including microhabitats. 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.				
Vocabulary Living Things and their Habitats	Living, dead, never been alive, names of local habitats, pond, woodland, meadow, name micro habitats, under log, stony path, under bushes, suited, basic needs, depend, food, food chain, shelter		Organism, alive/living, characteristics, movement, respiration, sensitivity, growth, reproduction, excretion, nutrition, animal, insect, plant Classification keys, environment, fish, amphibians, reptiles, birds, mammals, vertebrates, invertebrates, names of them, human impact, positive, negative (impact).	Life cycle, reproduction, sexual, asexual, germination, pollination, seed formation, seed dispersal, pollen, stamen, stigma, plantlets, runners, mammal, amphibian, insect, bird, reptile, eggs, fish, amphibians, reptiles, birds, mammals,	Classification system, key, micro-organisms, mammal, amphibian, insect, bird, fish, reptile, eggs, fungus, mushrooms, environment, fish, amphibians, reptiles, birds, mammals, vertebrates, invertebrates, arachnid, mollusc, insect, crustacean, divide, sub-divide
Evolution and Inheritance					Recognise that living things have changed over time and that fossils provide information about



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					living things that inhabited the Earth millions of years ago. Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.
Vocabulary Evolution and Inheritance					Fossils, Adaptation, Evolution, Characteristics, Reproduction, Genetics, Chromosomes, Natural Selection
Plants	Plants Observe and know how seeds and bulbs grow into mature plants. Find out about and describe how plants need water, light	Plants Identify, know and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers.			



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	and suitable temperature to grow and stay healthy.	Explore and know 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. Investigate and understand the way in which water is transported within plants. Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.			
Vocabulary Plants	seeds, bulbs, water, light, growth, healthy, shoot, seedling, leaf, flower, blossom, petal, fruit, root, bulb, stem, air, nutrients, soil, grow, healthy,	seeds, bulbs, water, light, growth, healthy, shoot, seedling, leaf, flower, blossom, petal, fruit, root, bulb, seed trunk, branch, stem, water, light, air, nutrients, soil, fertiliser, grow, healthy, transported,			



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		life cycle, pollination, seed formation, seed dispersal			
Materials Uses of everyday materials (Y2) States of matter (Y4) Properties and changes of materials (Y5)	To investigate everyday Materials Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. Identify and compare and know the uses of a variety of everyday materials, including wood, metal, plastic, glass, brick/rock, and paper/cardboard.	Rocks Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. Describe, in simple terms, how fossils are formed when things that have lived are trapped within rock. Recognise that soils are made from rocks and organic matter	To investigate materials (States of Matter) Compare and group materials together, according to whether they are solids, liquids or gases. Observe that some materials change state when they are heated or cooled, and measure the temperature at which this happens in degrees Celsius(°C) building on their teaching in mathematics. Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.	Properties and changes of Materials 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. Know that some materials will dissolve in liquid to Form a solution, and describe how to recover a substance from a solution. Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.	



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				Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. Demonstrate that dissolving, mixing and changes of state are reversible changes. 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.	
Vocabulary	<u>Everyday materials and their uses</u> Hard, Soft, Stretchy, Stiff, Shiny, Dull, Rough, Smooth, Bendy, Waterproof, Absorbent, Opaque, Transparent Brick, Paper,	Rocks Fossils, Soils, Sandstone, Granite, Marble, Pumice, Crystals, Absorbent, texture, magma, molten	States of Matter Solid, Liquid, Gas, Evaporation, Condensation, Particles, Temperature, Freezing, Heating	Properties and changes of materials Hardness, Solubility, Transparency, Conductivity, Magnetic, Filter, Evaporation, Dissolving, Mixing	



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	Fabrics, Squashing, Bending, Twisting, Stretching Elastic, Foil				
Sound			Sound Identify how sounds are made, associating some of them with something vibrating. Recognise that vibrations from sounds travel through a medium to the ear. Find patterns between pitch of a sound and features of the object that produced it. Find patterns between the volume of a sound and the strength of the vibrations that produced it. Recognise that sounds get fainter as the distance from the sound's source increases.		
Vocabulary			Volume, Vibration, Wave,		



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Sound			Pitch, Tone, Speaker, insulation, percussion		
Light		Recognise that they need light in order to see things and that dark is absence of light. Notice that light is reflected from surfaces Recognise that light from the sun can be dangerous and that there are ways to protect the eyes. Recognise that shadows are formed when light from a light source is blocked by a solid object. Find patterns in the way that the size of shadow change.			Recognise that light appears to travel in straight lines. 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. 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. Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.
Vocabulary Light		Light, Shadows, Mirror, Reflective, Dark, Reflection Transparent, Opaque,			Refraction, Reflection, Light, Spectrum, Rainbow, Colour, optics, lens, absorption, prism



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		Translucent			
Electricity			Identify common appliances that run on electricity. Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. 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. Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. Recognise some common conductors and insulators and associate metals with being		Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. 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. Use recognised symbols when representing a simple circuit in a diagram.



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			good conductors.		
Vocabulary Electricity			Cells, Wires, Bulbs, Switches, Buzzers, Battery, Circuit, Series, Conductors, Insulators		Cells, Wires, Bulbs, Switches, Buzzers, Battery, Circuit, Series, Conductors, Insulators, Amps, Volts, Cell, terminal, voltage, current
Forces		Compare how things move on different surfaces, notice that some forces need contact between 2 objects, but magnetic forces can act at a distance. Observe how magnets attract or repel each other and attract some materials and not others. 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.		Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. Identify the effects of air resistance, water resistance and friction that act between moving surfaces. Recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect.	



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		Describe magnets as having 2 poles. Predict whether 2 magnets will attract or repel each other, depending on which poles are facing.			
Vocabulary Forces		Forces and magnets Magnetic, Force, Contact, Attract, Repel, Friction, Poles, Push, Pull		Forces Air resistance, Water resistance, Friction, Gravity, Newton, Gears, Pulleys	
Earth and Space				Earth and space Describe the movement of the Earth, and other planets, relative to the Sun in the solar system. Describe the movement of the Moon relative to the Earth. Describe the Sun, Earth and Moon as approximately spherical bodies.	



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				Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.	
Vocabulary Earth and Space				Earth, Sun, Moon, Axis, Rotation, Day, Night, Phases of the Moon, star, constellation	