



Beeston Primary School Science Progression Grid



At Beeston Primary School, our Science curriculum is designed to develop curious, knowledgeable and reflective learners who understand the world around them through scientific enquiry. Through carefully sequenced knowledge, progressive disciplinary skills and rich practical experiences, pupils develop an understanding of key scientific concepts whilst learning to think and work like scientists. The curriculum builds upon prior knowledge, revisits key concepts over time and equips pupils with the vocabulary and scientific understanding needed for future learning and life in modern Britain. Key vocabulary is explicitly taught, revisited and assessed to support pupils in developing scientific understanding and disciplinary literacy. All pupils, including disadvantaged pupils and pupils with SEND, access the same ambitious science curriculum. Scaffolding, practical resources, pre-teaching of vocabulary, visual supports and adapted recording methods are used where appropriate to enable all pupils to achieve the intended learning outcomes. Teachers assess pupils' substantive and disciplinary knowledge throughout each unit through retrieval practice, questioning, observation of practical work and end of unit assessments. Assessment informs future teaching and identifies misconceptions. Pupils learn about the contributions of diverse scientists from different cultures, backgrounds and historical periods to develop an understanding of science as a global and collaborative endeavour.

Scientific Enquiry			
At EYFS: Children know about similarities and differences in relation to places, objects, materials and living things Children talk about the features of their own immediate environment and how environments might vary from one another Children describe shapes, spaces, and measures	At Key Stage One: E1: ask simple questions and recognise that they can be answered in different ways E2: observe closely, using simple equipment E3: perform simple tests E4: identify and classify E5: use their observations and ideas to suggest answers to questions E6: gather and record data to help in answering questions	At Lower Key Stage Two: E1: ask relevant questions and use different types of scientific enquiries to answer them E2: set up simple practical enquiries, comparative and fair tests E3: make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers E4: gather, record, classify and present data in a variety of ways to help in answering questions E5: record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables E6: report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions E7: use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions E8: identify differences, similarities or changes related to simple scientific ideas and processes E9: use straightforward scientific evidence to answer questions or to support their findings.	At Upper Key Stage Two: E1: plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary E2: take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate E3: record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs E4: using test results to make predictions to set up further comparative and fair tests E5: report and present 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 E6: identify scientific evidence that has been used to support or refute ideas or arguments
Being a Scientist			
At EYFS: Children make observations of animals and plants and explain why some things occur, and talk about changes Children use what they have learnt about media and materials in original ways, thinking about uses and purposes	At Key Stage One: B1: Enable pupils to experience and observe phenomena, looking more closely at the natural and humanly-constructed world around them. B2: They should be encouraged to be curious and ask questions about what they notice.	At Lower Key Stage Two: B1: Pupils in years 3 and 4 should be given a range of scientific experiences to enable them to raise their own questions about the world around them. B2: They should start to make their own decisions about the most appropriate type of scientific enquiry they might use to	At Upper Key Stage Two: B1: Pupils in years 5 and 6 should use their science experiences to: explore ideas and raise different kinds of questions; select and plan the most appropriate type of scientific enquiry to use to answer scientific questions; recognise when and how to set up comparative and fair tests and explain

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	B3: 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. B4: 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.	answer questions; recognise when a simple fair test is necessary and help to decide how to set it up; talk about criteria for grouping, sorting and classifying; and use simple keys. B3: They should begin to look for naturally occurring patterns and relationships and decide what data to collect to identify them B4: They should help to make decisions about what observations to make, how long to make them for and the type of simple equipment that might be used. B5: They should learn how to use new equipment, such as data loggers, appropriately. B6: They should collect data from their own observations and measurements, using notes, simple tables and standard units, and help to make decisions about how to record and analyse this data. B7: With help, pupils should look for changes, patterns, similarities and differences in their data in order to draw simple conclusions and answer questions. B8: With support, they should identify new questions arising from the data, making predictions for new values within or beyond the data they have collected and finding ways of improving what they have already done. B9: They should also recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations. B10: Pupils should use relevant scientific language to discuss their ideas and communicate their findings in ways that are appropriate for different audiences.	which variables need to be controlled and why. B2: They should use and develop keys and other information records to identify, classify and describe living things and materials, and identify patterns that might be found in the natural environment. B3: They should make their own decisions about what observations to make, what measurements to use and how long to make them for, and whether to repeat them; choose the most appropriate equipment to make measurements and explain how to use it accurately. B4: They should decide how to record data from a choice of familiar approaches; look for different causal relationships in their data and identify evidence that refutes or supports their ideas. B5: They should use their results to identify when further tests and observations might be needed; recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact. B6: They should use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas and should talk about how scientific ideas have developed over time.
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EYFS	Characteristics of effect learning	Early Learning Goals
Enquiry Skills	Show curiosity about objects, events and people Questions why things happen Engage in open-ended activity Take a risk, engage in new experiences and learn by trial and error Find ways to solve problems / find new ways to do things / test their ideas Develop ideas of grouping, sequences, cause and effect Comments and asks questions about aspects of their familiar world such as the place where they live or the natural world Use senses to explore the world around them Make links and notice patterns in their experiences Create simple representations of events, people and objects Build up vocabulary that reflects the breadth of their experience	Choose the resources they need for their chosen activities Handle equipment and tools effectively Answer how and why questions about their experiences Make observations Develop their own narratives and explanations by connecting ideas or events Explain why some things occur and talk about changes
Understanding the world	The Natural World: Explore the natural world around them, making observations and drawing pictures of animals and plants; Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class; Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter. Describe what they see, hear and feel	

Strand/ Topic area		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Working Scientifically	Research using Secondary Sources	Ask simple questions	Use observations and ideas to suggest answers to questions	Ask relevant questions Start to make predictions	Make sensible predictions Suggest possible further questions Use straightforward scientific evidence to answer questions and support their findings	Use test results to make appropriate, linked predictions and ask further questions Recognise when other sources of information (secondary sources) will help answer questions that cannot be answered through practical investigations	Make predictions for new values Use a range of sources to support own evidence and talk about how scientific ideas have developed over time Evaluate the reliability of their methods and suggest improvements Identify scientific evidence that has been used to support or refute ideas or arguments
	Comparative and Fair Testing	Recognise that questions can be answered in different ways Perform simple tests	Carry out pre-planned investigations – with support	Use different types of scientific enquiries to answer questions Set up simple practical enquiries Set up simple comparative tests	Set up fair tests Identify differences, similarities or changes related to simple scientific ideas and processes	Plan different types of scientific enquiries to answer questions – including recognising and controlling variables where necessary Suggest sensible improvements to experiments	Set up further comparative and fair tests in response to results
	Observing over Time	Observe closely Use simple equipment	Gather and record data to help answer questions – with support	Start to make systematic and careful observations Take accurate measurements using standard units	Make systematic and careful observations Take accurate measurements using standard units using a range of equipment	Take accurate, precise measurements using appropriate equipment Know and explain when it is appropriate	Choose the most appropriate method for recording data and results of increasing complexity

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Biology	Identifying, Grouping and Classifying			Gather and record data to help answer questions Start to record findings using simple scientific language	including thermometers and data loggers Record findings using simple scientific language – demonstrate through drawings, labelled diagrams, keys, bar charts and tables	to take repeat measurements Gather, record, classify and present data in a variety of ways including scientific diagrams and labels, keys, graphs and tables	Make a series of observations, comparisons and measurements with precision
	Pattern Seeking	Talk about what they have found out	Start to use simple scientific language in context Identify and classify objects as part of an investigation	Report back on findings verbally Form conclusions from findings Suggest improvements to investigations Use straightforward scientific evidence to answer questions	Classify and present data in a variety of ways to help in answering questions Report back on findings verbally and through written explanations, displays, presentations etc.... Form sensible conclusions from findings	Use scientific evidence to answer questions Use scientific evidence to support findings Use results to draw conclusions	Present observations and data using appropriate methods Report and present results including conclusions, causal relationships and explanations Make conclusions consistent with evidence and related to scientific understanding
	Animals	Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals Identify and name a variety of common animals that are carnivores, herbivores and omnivores	Notice that animals, including humans have offspring which grow into adults Find out about and describe the basic needs of animals, including humans, for survival (water, food, air)	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 Identify that humans and some other animals have skeletons and muscles for support,	Construct and interpret a variety of food chains, identifying producers, predators and prey		Describe the ways in which nutrients and water are transported within animals (including humans)

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		Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets)		protection and movement			
Biology	Humans	Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense	Notice that humans have offspring which grow into adults Find out about and describe the basic needs for survival (food, water, air) Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene	Identify that humans need the right types and amount of nutrition and that they cannot make their own food – they get nutrition from what they eat Identify that humans 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	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 humans (and other animals)
	Animals and Humans Vocabulary	Fish, Reptiles, Mammals, Birds, Amphibians (+ examples of each) Herbivore, Omnivore, Carnivore, Leg, Arm, Elbow, Head, Ear, Nose, Back, Wings, Beak.	Survival, Adult, Offspring, Exercise, Hygiene, Dental, Life Cycle, Young, Reproduction, Kitten, Calf, Puppy, Water, Air, Food.	Nutrition, nutrients, carbohydrates, protein, fats, fibre, vitamins, minerals, invertebrates, vertebrates, Balanced diet, Skeletons, contract, relax, joints, Movement, Muscles, Bones, Skull,	Digestive system, saliva, Mouth, Tongue, Teeth, Oesophagus, Stomach, Small Intestine, Large Intestine, Herbivore, Carnivore, Canine, Incisor, Molar, Premolar. Predator, Prey, Food chain, Mammals. Pancreas, Liver, Rectum, Anus.	Foetus, Embryo, Womb, Gestation, Baby, Toddler, Teenager, Adolescence, Adulthood, Elderly. Growth, Development, Puberty, life cycle, fertilisation, Reproduce, Life Expectancy, Prenatal, Asexual reproduction,	Circulatory, Heart, Blood Vessels, Veins, Arteries, (De) Oxygenated, Aorta, Atrium, Capillaries, Deoxygenated, Valve, Vena Cava, Ventricle, Exercise, Respiration, Lifestyle, Substances. Microorganism, Organ, Pulse, Species.

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Biology	Plants	Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees Identify and describe the basic structure of a variety of common flowering plants, including trees	Observe and describe how seeds and bulbs grow into mature plants Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy	Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers 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 Investigate 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			
	Plants Vocabulary	Deciduous, Evergreen trees, Leaves, Flowers (blossom), Petals, Fruit, Roots, Bulb, Seed, Trunk, Branches, Stem.	Seeds, Bulbs, Water, Light, Temperature, Growth, Germination, Shoot, Dispersal,	Air, Light, Water, Nutrients, Soil, Reproduction, Transportation, Dispersal, Pollination, Flower, Evaporation,			

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			Stem, Petal, Root, Leaf, Pollination.	Fertilisation, Seed formation.			
Biology	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 habitats – including microhabitats Describe how animals obtain their food from plants and other animals using the idea of a simple food chain –		Recognise that living things can be grouped in a variety of ways Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment Recognise that environments can change and that this can sometimes pose dangers to living things	Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird Describe the life processes of reproduction in some plants and animals	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 Give reasons for classifying plants and animals based on specific characteristics

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			identify and name different sources of food				
	Living Things and their habitats vocabulary		Living, Dead, Habitat, Energy, Food chain, Predator, Prey, Life processes, Never lived, Food sources, Depend, Survive. Woodland, Pond, Desert, Urban, Coastal, Forest, Arctic, Ocean, Mountains		Vertebrates, Fish, Amphibians, Reptiles, Birds, Mammals, Invertebrates, Snails, Slugs, Worms, Spiders, Insects, Environment, Habitats.	Mammal, Reproduction (Sexual and Asexual), Insect, Amphibian, Bird, Offspring. Fertilise, Gestation, Life cycle, Metamorphosis, Pollination, Cutting, Bulb.	Classification, Micro-organisms, Characteristics, Identity, Taxonomist, Bacteria, Microscope, Species, Habitats, Biology.
	Evolution and Inheritance						Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago Recognise that living things produce offspring, but normally offspring vary and are not identical to their parents Identify how animals and plants are adapted to suit their environment and that adaptations lead to evolution

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	Evolution vocabulary						Evolution, adaptation, inherited traits, adaptive traits, natural selection, inheritance, Characteristics, Environment, Charles Darwin, Alfred Wallace, DNA, variation, offspring, fossil, variation, fossil record.
Chemistry	Materials Including: Everyday uses of materials (Year 1 and 2) and properties and changes (year 5)	Distinguish between an object and the material from which it is made Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water and rock Describe the simple physical properties of a variety of everyday materials Compare and group together a variety of everyday materials on the basis of their simple physical properties	Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching			Compare and group everyday materials based on their properties, including hardness, solubility, transparency, conductivity (electrical and thermal) and magnetism Know some materials dissolve in liquid to form a solution and describe how to recover a substance from solution Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating Give reasons, based on evidence from comparative and fair tests, for the particular	

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						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 these changes are not usually reversible eg: changes from burning or the action of acid on bicarbonate of soda.	
	Materials Vocabulary	Hard, Soft, Stretchy, Stiff, Shiny, Dull, Rough, Opaque, Transparent, Waterproof, Bendy, Manmade, Natural, Absorbent. Wood, Plastic, Glass, Metal, Water, Rock.	Properties, Material, Malleable, Flexible, Rigid, Coarse, Smooth, Suitability. Paper, Fabrics, Squashing, Bending, Twisting, Stretching, Elastic, Foil, Fabric, Paper, Rubber, Cardboard.			Properties, Solubility, Electrical – conductor, Thermal, Conductor, Dissolve, Solution, Separate, Reversible changes, Dissolving, Evaporation, Filtering, sieving, melting, Irreversible Changes, Material, Insulation, Chemical, Gas, Liquid, Solid, Thermal, Soluble, Insoluble, Mixture, Solution, Evaporation	

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Chemistry	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			
Chemistry	Rocks Vocabulary			Pumice, Crystals, Absorbent, Sedimentary, Organic matter, Grains, Decay, Igneous , Imprint, Magma, Metamorphic, Mineral, Molten, Palaeontology, Permeable, Porous, Fossils, Sandstone, Granite, Marble, Rock.			
Chemistry	States of Matter				Compare and group materials together according to whether they are solids, liquids or gases		

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					Observe that some materials change state when they are heated or cooled: measure or research the temperature at which this happens in degrees C ($^{\circ}\text{C}$) Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature		
	States of Matter Vocabulary				Solid, Liquid, Gas, States of matter, Evaporation, Condensation, Melting, Particles, Freezing, Boiling, solidify, changing state, degrees Celsius, water cycle, Water vapour, Material.		
Physics	Seasonal Changes	Observe changes across the four seasons Observe and describe weather associated with the seasons and how day length varies.					

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	Seasonal Changes vocabulary	Summer, Spring, Autumn, Winter, Sun, Day, Moon, Night, Seasons, Weather. Light, Dark					
Physics	Light			Recognise that light is needed in order to see things and that dark is the 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 their eyes Recognise that shadows are formed when the light from a light source is blocked by an opaque object Find patterns in the way that the size of shadows 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

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	Light Vocabulary			Reflective, Reflection, Natural, Artificial, Bright, Dark, Dim, Electricity, Emits, Mirror, Light, Opaque, Shadows, Torches, Translucent, Transparent.			Refraction, Reflection, Spectrum, Rainbow, reflect, Light source, object, shadows, mirrors, periscope, filters, Law of reflection
Physics	Forces and Magnets			Compare how things move on different surfaces Notice that some forces need contact between two 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 Describe magnets as having two poles		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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				Predict whether two magnets will attract or repel each other depending on which poles are facing			
	Forces and Magnets Vocabulary			Magnet, Contact Force, Non-Contact Force, Attract, Repel, Friction, Poles, Magnetic Poles, Magnetic Field, Magnetic Materials.		Gravity, air resistance, water resistance, friction, Levers, mechanism, pulley, gear, spring, theory of gravitation, Galileo Galilei, Isaac Newton, Parachute, Gravitational Pull, Friction.	
Physics	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 the 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		

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					distance from the sound source increases		
	Sound Vocabulary				Vibration, Wave, Pitch, Tone, Percussion, Wood wind, Brass, Insulate, Medium, Volume, Amplitude, Sound Source, Vibration, Travel, Ear.		
Physics	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		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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					and insulators, and associate metals with being good conductors		
	Electricity Vocabulary				Cells, Switches, Buzzers, Motor, Circuit, Series, Conductors, Insulators, complete circuit, Electricity, Wires, Battery.		Amps, Volts, Voltage, Cell, Circuit, Symbols, Ammeter, Battery. Component, Conductor, Current, Electricity, Insulator, Voltage, Switch, Bulbs, Buzzers, Motors.
Physics	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 Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky	
	Earth and Space Vocabulary					Earth, Sun, Moon, Orbit, Axis, Rotation, Spherical, Hemisphere, Season, Tilt,	

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						Phases of the Moon, star, constellation, Solar system, Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptune, Celestial, Planet, Satellite, Day, Night	
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