Charlton Mackrell C of E Primary School

'The one who gets wisdom loves life.' Proverbs 19:8

Our **science** curriculum is based on the following principles:

- Developing children's sense of curiosity in their world.
- Encouraging children to observe and ask questions about what they learn and have the desire to find the answers for themselves, through application of learned concepts.
- Ensuring children have a deep-rooted knowledge of the world around them, including how they, as humans, fit into this world.
- Develop children's thinking to ensure that they question results collected or ideas and apply a reflective approach.
- Children are immersed in age-appropriate scientific vocabulary in all year groups to ensure that they have the subject-specific language skills required to communicate their understanding.
- The science curriculum provides real-life opportunities to apply and deepen their skills and knowledge in the core curriculum subjects ensuring that they can understand the rationale behind learning in these areas.

Key:

	Animals including humans
	Plants
	Living things and their habitats
	Material science
	Forces
	Electricity
	Light and sound

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Knowledge and skills as a scientist	I can ask simple questions and recognise that they can be answered in different ways.	I can ask simple questions and recognise that they can be answered in different ways.	I can ask relevant questions and use different types of scientific enquiries to answer them.	I can ask relevant questions and use different types of scientific enquiries to answer them.	I can plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.	I can plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.
	I can observe closely, using simple equipment.	I can observe, using simple equipment.	I make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.	I make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.	I take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings where appropriate.	I take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings where appropriate.
	I can perform simple tests.	I can perform simple tests.	I know how to set up simple practical enquiries and comparative and fair tests.	I know how to set up simple practical enquiries and comparative and fair tests.		
	I know how to identify and classify	I know how to identify and classify	I gather, record, classify and present	I gather, record, classify and present		

	a range of different components.	a range of different components.	data in a variety of ways to help in answering questions.	data in a variety of ways to help in answering questions.		
	I can use my observations and ideas to suggest answers to questions.	I can use my observations and ideas to suggest answers to questions.	I record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables.	I record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables.	I record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.	I record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.
	I can gather and record data to help in answering questions.	I can gather and record data to help in answering questions.	I report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.	I report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.	I report and present findings from enquiries, including conclusions, casual relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.	I report and present findings from enquiries, including conclusions, casual relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.
			I use results to draw simple conclusions, make predictions for new values, suggest improvements and	I use results to draw simple conclusions, make predictions for new values, suggest improvements and	I use test results to make predictions to set up further comparative and fair tests.	I use test results to make predictions to set up further comparative and fair tests.

			raise further questions.	raise further questions.		
			I identify differences, similarities or changes related to simple scientific ideas and processes.	I identify differences, similarities or changes related to simple scientific ideas and processes.	I identify scientific evidence that has been used to support or refute ideas or arguments.	I identify scientific evidence that has been used to support or refute ideas or arguments.
			I use straightforward scientific evidence to answer questions or to support findings.	I use straightforward scientific evidence to answer questions or to support findings.		
Key vocabulary	Question, answer, observe, observing, equipment, identify, classify, sort, diagram, chart, map, data, compare, contrast, describe, biology, chemistry, physics, group, record.	Question, answer, observe, observing, equipment, identify, classify, sort, diagram, chart, map, data, compare, contrast, describe, biology, chemistry, physics, group, record.	Research, relevant, questions, scientific enquiry, comparative and fair test, systematic, careful, observations, accurate measurements, equipment, thermometer, data logger, data gather, record, classify, present, record drawings, labelled diagrams, keys, bar charts, tables, oral and written	Research, relevant, questions, scientific enquiry, comparative and fair test, systematic, careful, observations, accurate measurements, equipment, thermometer, data logger, data gather, record, classify, present, record drawings, labelled diagrams, keys, bar charts, tables, oral and written	Plan, variables, measurements, accuracy, precision, repeat readings, record data, scientific diagrams, labels, classification, keys, tables, scatter graphs, bar graph, line graph, predictions, further comparative data and fair test, report and present conclusions, casual relationships, explanations,	Plan, variables, measurements, accuracy, precision, repeat readings, record data, scientific diagrams, labels, classification, keys, tables, scatter graphs, bar graph, line graph, predictions, further comparative data and fair test, report and present conclusions, casual relationships, explanations,

			explanations, conclusion, predictions, differences, similarities, changes, evidence, improve, secondary sources, guides, keys, construct, interpret.	explanations, conclusion, predictions, differences, similarities, changes, evidence, improve, secondary sources, guides, keys, construct, interpret.	degree of trust, oral and written display and presentation, evidence support, refute ideas or arguments, identify, classify and describe, patterns, systematic, quantitative measurements.	degree of trust, oral and written display and presentation, evidence support, refute ideas or arguments, identify, classify and describe, patterns, systematic, quantitative measurements.

	Key Stage 1		Lower Key Stage 2		Upper Key Stage 2	
Curriculum Knowledge and Skills	Animals including humans Children are taught to: Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)	Everyday materials Children are taught to: Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.	Rocks Children are taught to: Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. Describe in simple terms how fossils	Light Children are taught to: Recognise that they need light in order to see things and that dark is the absence of light. Notice that light is reflected from surfaces.	Living things and their habitats Children are taught to: Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and	Electricity Children are taught to: Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit.

	Identify and name a variety of common animals that are carnivores, herbivores and omnivores		are formed when things that have lived are trapped within rock. Recognise that soils are made from rocks and organic matter. Stone girl, bone girl by Laurence Anholt Trip to Lyme Regis or Hansom Quarry.	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 the size of shadows change. Shadow puppet theatre Drama visiting production company	differences, including microorganisms, plants and animals. Give reasons for classifying plants and animals based on specific characteristics. 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.	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.

Vocabulary	Survival, water, air, food, adult, baby, offspring, kitten, calf, puppy, exercise, hygiene.	Wood, plastic, glass, paper, water, metal, rock, hard, soft, bendy, rough, smooth.	Fossils, hard, soft, soil, crystal, clay, sandstone, granite, basalt, limestone, marble, flint, chalk.	Light, shadows, mirror, reflective, dark, reflection.	Classification, vertebrates, invertebrates, micro-organisms, amphibians, reptiles, mammals, insects.	Hardness, solubility, transparency, conductivity, magnetic, filter, evaporation, dissolving, mixing.

	Key Stage 1		Lower Key Stage 2		Upper Key Stage 2	
Curriculum Knowledge and Skills	Seasonal changes Children will be taught to: Observe changes across the four seasons. Observe and describe weather associated with the seasons and how day length varies. Never look directly at the sun, even when wearing dark glasses as it is not safe.	Animals including humans Children will be taught to: 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.	Animals including humans Children will be taught to: Identify that animals, including humans, need the right types and amounts 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	States of matter Children will be taught to: Compare and group materials together, according to whether they are solids, liquids or gases. Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. Observe that some materials change	Electricity Children will be taught to: 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	Light Children will be taught to: 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

			support and movement. 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 and air).	state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius. Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.	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 good conductors. Visit to the Magdalen Project, near Chard	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	Spring, summer, autumn, winter, day, night, sun rise, sun set.	Fish, reptiles, mammals, birds, amphibians (examples of each), herbivore, omnivore,	Movement, muscles, bones, skull, nutrition, skeletons.	Water cycle, solid, liquid, gas, evaporation, degrees Celsius, temperature, change state.	Cells, wires, bulbs, switches, buzzers, battery, circuit, series, conductors, insulators, amps, volts.	Refraction, reflection, light, spectrum, rainbow, colour, shadow, light source, periscope.

		carnivore, leg, arm, elbow, head, ear, nose, back, wings, beak.				

	Key Stage 1		Lower Key Stage 2		Upper Key Stage 2	
Curriculum Knowledge and Skills	Plants Children will be taught to: 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.	Everyday materials Children will be taught to: 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.	Forces and Magnets Children will be taught to: 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.	Plants Children will be taught to: 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	Properties and changes of materials Children will be taught to: 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	Space and Earth Children will be taught to: 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

		Compare and group together a variety of everyday materials on the basis of their simple physical properties.	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. Predict whether two magnets will attract or repel each other, depending on which poles are facing. Visit to 'We the Curious' in Bristol.	transported within plants. Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.	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. 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.	night and the apparent movement of the sun across the sky.

					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 bircarbonate of soda.	
Vocabulary	Deciduous, evergreen trees, leaves, flowers (blossom), petals, fruit, roots, bulb, seed, trunk, branches, stem.	Wood, plastic, glass, paper, water, metal, rock, hard, soft, bendy, rough, smooth.	Magnetic, force, contact, attract, repel, friction, poles, push, pull.	Seeds, bulbs, water, light, temperature, growth.	Hardness, solubility, transparency, conductivity, magnetic, filter, evaporation, dissolving, mixing.	Earth, sun, moon, axis, rotation, day, night, phases of the moon, star, constellation.

	Key Stage 1		Lower Key Stage 2		Upper Key Stage 2	
Curriculum Knowledge and Skills	Animals including humans Children will be taught to: Identify , name, draw and label the basic parts of the human body and	Plants Children will be taught to: Identify and name a variety of common wild and garden plants, including	Plants Children will be taught to: Observe and describe how seeds and bulbs grow into mature plants.	Plants Children will be taught to: Find out and describe how plants need water, light and a suitable temperature to	States of matter Children will be taught to: Compare and group materials together, according to whether they	Forces Children will be taught to: Explain that unsupported objects fall toward the Earth because

	say which part of the body is associated with each sense. Describe and compare the structure of a variety of common animals, (fish, amphibians, reptiles, birds and mammals, including pets)	deciduous and evergreen trees. Identify and describe the basic structure of a variety of common flowering plants, including trees.	(Seeds and bulbs need water to grow but most do not need light: seeds and bulbs have a store of food inside them.) Identify and describe the functions of different parts of flowering plants; roots, stem/trunk. Leaves and flowers. Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.	grow and stay healthy. Investigate the way in which water is transported within plants. Visit to Lytes Cary. Workshop with the gardener about plants and then an inside workshop looking at people from the past.	are solids, liquids or gases. 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. Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperatures.	of the force of gravity acting between the Earth and the falling object. Identify the effects of air 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.
Vocabulary	Survival, water, air, food, adult, baby, offspring, kitten, calf, puppy, exercise, hygiene, lungs, heart, head, ears, eyes.	Deciduous, evergreen trees, leaves, flowers (blossom), petals, fruit, roots, bulb, seed, trunk, branches, stem.	Roots, stem, trunk, leaves, flowers, water, light, temperature, seeds, bulbs.	Roots, stem, trunk, leaves, flowers, water, light, temperature, seeds, bulbs. Capillary action, germination, nutrients, soil, life cycle of a plant, pollination, seed	Evaporation, condensation, water cycle, temperature, solids, liquids, gases, change state – heated or cooled, degrees Celsius, filter, sieve, solubility,	Gravity, air resistance, water resistance, friction, mechanisms, levers, pulleys, gears, Galileo Galilei and Isaac Newton.

				formation and seed dispersal.	transparency, conductivity, solution, reversible and irreversible change.	

	Key Stage 1		Lower Key Stage 2		Upper Key Stage 2	
Curriculum Knowledge and Skills	Everyday materials Children will be taught to: 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	Animals including humans Children will be taught to: Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. Describe and compare the structure of a variety of common animals, (fish, amphibians, reptiles, birds and mammals, including pets)	Living things and their habitats Children will be taught to: Explore and compare the differences between things that are living, dead, and things that have never been alive. Describe how animals obtain food from plants and other animals using the idea of a simple food chain, and identify and name different sources of food.	Forces and magnets Children will be taught to: 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.	Animals including humans Children will be taught to: 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.	Properties and change 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

	variety of everyday materials on the basis of their simple physical properties.		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. Visit to the Roman Baths.	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. Predict whether two magnets will attract or repel each other, depending on which poles are facing.	Describe the way in which nutrients and water are transported within animals, including humans. 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	substance from a 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 uses of everyday materials, including metal, 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	Wood, plastic, glass, paper, water, metal, rock, hard, soft, bendy, rough, smooth.	Survival, water, air, food, adult, baby, offspring, kitten, calf, puppy, exercise, hygiene, lungs, heart, head, ears, eyes.	Classification, habitats, microhabitats, vertebrates, invertebrates, amphibians, reptiles, birds, mammals, insects.	Magnetic forces, attract, repel, poles.	Digestive system, food chains, producers, predators, prey, mouth, tongue, teeth, oesophagus, stomach, small and large intestine, teeth, carnivores, herbivores, heart, blood vessels, gestation period, development of humans.	Hardness, solubility, transparency, conductivity, solution, solids, liquids, gases, filter, sieve, evaporate, dissolve, reversible, irreversible, melting, Spencer Silver, Ruth Benerito.

	Key Stage 1		Lower Key Stage 2		Upper Key Stage 2	
Curriculum Knowledge and Skills	Everyday materials Children will be taught to distinguish between an object and the material	Seasonal Changes Children will be taught to:	Uses of everyday materials Children will be taught to:	Animals including humans Children will be taught to:	Evolution and inheritance Children will be taught to:	Sound Children will be taught to: Identify how sounds are made,

	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.	Observe changes across the four seasons. Observe and describe weather associated with the seasons and how day length varies. Never look directly at the sun, even when wearing dark glasses as it is not safe.	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. Visit from a local artist from Kingsdon.	Identify that animals, including humans, need the right types and amounts of nutrition and that they cannot make their own food; they get nutrition from what they eat. Identify the humans and some other animals have skeletons and muscles for support, protection and movement. Visit to Weymouth.	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 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.	associating some of them with something vibrating. Recognise that vibrations from sound 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 produce it. Recognise that sounds get fainter as the distance from the sound source increases.

Vocabulary	Wood, plastic, glass, paper, water, metal, rock, hard, soft, bendy, rough, smooth.	Spring, summer, autumn, winter, day, night, sun rise, sun set.	Hardness, solubility, transparency, conductivity, magnets, dissolve, solution, solid, liquid, gas, squashing, bending, twisting, stretching.	Nutrition, skeleton, muscles, protection, movement,	Fossils, inhabited, adaptation, evolution, offspring, variation, palaeontologist, Mary Anning, Charles Darwin, Alfred Wallace, genes, chromosomes.	Vibration, pitch, patterns, rhythm, melody, volume, insulation.

Impact of our Science Curriculum

- Children will understand that scientific learning is all around them in the real world and that aspects learnt in school can be applied to this.
- Children will know how to observe things changing and form conclusions from these observations.
- Children will develop their curiosity in order to ask and give answers to a range of questions.
- Children will learn to record their findings in a variety of ways.
- Children will know how to draw conclusions from these findings.
- Children will be confident in the selection of and use of a variety of different resources.
- Children will be able to use their prior knowledge to make predictions about what might happen in different situations.
- Children will know how scientific findings have been used to form evidence or refute evidence presented.