Science skills

Big idea	Aspect	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Humankind	**Human body**	AOL: World Draw pictures of the human body and name some of the different body parts.	Draw and label the main parts of the human body and say which body part is associated with which sense. covered	Describe the stages of human development (baby, toddler, child, teenager, adult and elderly).	Describe how humans need the skeleton and muscles for support, protection and movement. covered	Describe the purpose of the digestive system, its main parts and each of their functions. covered optional x 5	Describe the process of human reproduction. covered	Name and describe the purpose of the circulatory system and the functions of the heart, blood vessels and blood. covered x 3 optional x 3
	Staying safe	AOL: PSED Follow instructions when in different environments and when handling simple equipment, such as scissors. covered optional	Describe ways to stay safe in some familiar situation	Describe what humans need to survive.	Explain why light from the Sun can be dangerous. covered	Explain the precautions needed for working safely with electrical circuits.	Explain the precautions needed for working safely when heating, burning, cooling and mixing materials.	Explain the dangers of using lasers and ways to use them safely. optional
	Healthy lifestyle	AOL: PSED Wash and dry hands regularly	Explain why hand washing and cleanliness	Describe the importance of a healthy	Explain the importance and characteristics	Describe what damages teeth and how to	Explain why personal hygiene is	Explain the impact of positive and

		and say why this is important. covered	are important.	lifestyle, including exercise, a balanced diet, good quality sleep and personal hygiene. covered	of a healthy, balanced diet.	look after them. covered x 3 optional x 3	important during puberty. optional	negative lifestyle choices on the body. covered x 2 optional x 4
Processes	**Pattern seeking**	AOL: World Notice and begin to describe patterns of weather in summer and winter. covered	Observe changes across the four seasons. covered	Describe typical UK seasonal weather patterns.	Find patterns in the way shadows change during the day. covered optional	Compare and find patterns in the volume of a sound, using a range of equipment, such as musical instruments. covered Compare and find patterns in the pitch of a sound, using a range of equipment, such as musical instruments. covered	Use the idea of Earth's rotation to explain day and night, and the Sun's apparent movement across the sky. covered	Explain, using words, diagrams or a model, why shadows have the same shape as the objects that cast them and how shadows can be changed. covered
	Changes	AOL: World Notice and talk about the differences in	Observe and describe how day length changes across	Describe how some objects and materials can be changed	Describe simply how fossils are formed, using words, pictures	Observe and explain that some materials change state	Identify, demonstrate and compare reversible and	Describe some significant changes that have happened

		day length between the seasons. optional x 2	the year. Assign	and how these changes can be desirable or undesirable. covered	or a model. covered x 2	when they are heated or cooled and measure or research the temperature in degrees Celsius (˚C) at which materials change state. covered	irreversible changes. covered optional x 2	on Earth and the evidence, such as fossils, that support this.
	Earth	AOL: World Describe simply how weather changes as the seasons change. covered x 3 optional x 3	Observe and describe different types of weather. covered optional x 5	Describe features of Earth using words and pictures.	Investigate soils from the local environment, making comparisons and identifying features. covered	Describe the water cycle using words or diagrams and explain the part played by evaporation and condensation. covered optional	Describe or model the movement of the planets in our Solar System, including Earth, relative to the Sun. covered optional x 2 Describe or model the movement of the Moon relative to Earth. covered x 2	Explain that, due to how light travels, we can see things because they give out or reflect light into the eye. covered Identify that light travels in straight lines. covered x 2
	Phenomena	AOL: World Name and	Explain in simple terms	Explain in simple terms	Explain, using words or	Explain how sounds are	Describe the Sun, Earth and	Describe, using scientific

		describe natural phenomena, such as the size of shadows, the colours of a rainbow, the speed of clouds moving across the sky and the strength of a wave. covered x 4	how shadows are formed. optional	how sounds are made. optional	diagrams, how shadows are formed when a light source is blocked by an opaque object. covered Describe the differences between dark and light and how we need light to be able to see. covered	made and heard using diagrams, models, written methods or verbally. covered x 2 optional x 3	Moon as approximately spherical bodies and use this knowledge to understand the phases of the Moon and eclipses. covered optional	language, phenomena associated with light (rainbows, colours on soap bubbles and refraction in a glass of water).
	Forces	AOL: World Describe, predict and sort things that float and sink and talk about the forces that they can feel. covered x 3 optional	Investigate weather using toys, models or simple equipment. covered x 3 optional x 2	Sort and group objects that float and sink. covered	Explain that an object will not move unless a push or pull force is applied, describing forces in action and whether the force requires direct contact or whether the force can act at a distance (magnetic force). covered x 2	Predict and describe whether a circuit will work based on whether or not the circuit is a complete loop and has a battery or cell. covered	Explain that objects fall to Earth due to the force of gravity. covered optional x 2	Explain how the brightness of a lamp or volume of a buzzer is affected by the number and voltage of cells used in a circuit. covered

					optional x 3			
	Modelling	AOL: World Explore and describe electrical and non-electrical light sources. covered x 2	Describe, following exploration, what simple electrical circuits can do. covered x 2	Make models with moving parts.	Make working models with simple mechanisms or electrical circuits. optional x 2	Construct operational simple series circuits using a range of components and switches for control. covered x 2	Describe and demonstrate how simple levers, gears and pulleys assist the movement of objects. covered	Create circuits using a range of components and record diagrammatically using the recognised symbols for electrical components. covered x 3 optional
Creativity	**Report and conclude**	AOL: CL Represent scientific observations by mark making, drawing or creating simple charts and tables. Offer explanations for why things happen, making use of vocabulary, such as, because, then and next. covered x 6	Talk about what they have done and say, with help, what they think they have found out. covered optional x 6	Begin to notice patterns and relationships in their data and explain what they have done and found out using simple scientific language. covered x 6 optional x 4	Use suitable vocabulary to talk or write about what they have done, what the purpose was and, with help, draw a simple conclusion based on evidence collected, beginning to identify next steps or improvements. covered	Use scientific vocabulary to report and answer questions about their findings based on evidence collected, draw simple conclusions and identify next steps, improvements and further questions. covered x 9 optional x 5	Use relevant scientific vocabulary to report on their findings, answer questions and justify their conclusions based on evidence collected, identify improvements, further questions and predictions. covered x 9	Report on and validate their findings, answer questions and justify their methods, opinions and conclusions, and use their results to suggest improvements to their methodology, separate facts from opinions, pose further

		optional x 9					optional x 4	questions and make predictions for what they might observe. covered x 3 optional x 8
	Gather and record data	AOL: Maths Record data in simple tables and pictograms. covered x 2 optional	With support, gather and record simple data in a range of ways (data tables, diagrams, Venn diagrams). covered x 4	Use a range of methods (tables, charts, diagrams and Venn diagrams) to gather and record simple data with some accuracy. covered x 4 optional x 6	Gather and record findings in a variety of ways (diagrams, tables, charts and graphs) with increasing accuracy. covered x 8 optional x 6	Gather, record, classify and present observations and measurements in a variety of ways (pictorial representations , timelines, diagrams, keys, tables, charts and graphs). covered x 5 optional x 8	Gather and record data and results of increasing complexity, selecting from a range of methods (scientific diagrams, labels, classification keys, tables, graphs and models). covered x 3 optional x 7	Choose an appropriate approach to recording accurate results, including scientific diagrams, labels, timelines, classification keys, tables, models and graphs (bar, line and scatter), linking to mathematical knowledge. covered x 5 optional x 3
Investigation	**Questioning**	AOL: CL Ask a relevant	Ask simple scientific	Ask and answer scientific	Ask questions about the	Ask relevant scientific	Ask a wide range of	Ask and answer deeper and

		scientific question to find out more, explain how things work and why they might happen. covered x 11 optional x 12	questions. covered	questions about the world around them. covered x 2 optional x 4	world around them and explain that they can be answered in different ways. covered optional	questions, independently, about the world around them and begin to identify how they can answer them. covered optional x 3	relevant scientific questions that broaden their understanding of the world around them and identify how they can answer them.	broader scientific questions about the local and wider world that build on and extend their own and others' experiences and knowledge. covered x 5 optional x 2
	Measurement	AOL: World With support, use simple equipment, such as timers, rulers and containers, to measure length, height, capacity and time. covered optional	With support, use simple equipment to measure and make observations. covered x 3 optional x 2	Use simple equipment to measure and make observations. covered x 2 optional x 3	Take measurements in standard units, using a range of simple equipment. covered	Take accurate measurements in standard units, using a range of equipment. covered optional	Take increasingly accurate measurements in standard units, using a range of chosen equipment. covered x 2 optional	Take accurate, precise and repeated measurements in standard units, using a range of chosen equipment. covered x 3
	Investigation	AOL: Exp A&D Observe how activities are going and adapt their	With support, follow instructions to perform simple tests and begin	Follow a set of instructions to perform a range of simple tests, making	Set up and carry out some simple, comparative and fair tests,	Begin to independently plan, set up and carry out a range of	Plan and carry out a range of enquiries, including writing	Plan and carry out a range of enquiries, including writing

		ideas if necessary. covered x 2 optional	to talk about what they might do or what might happen. covered x 4	simple predictions for what might happen and suggesting ways to answer their questions. covered x 4	making predictions for what might happen. covered x 3 optional x 5	comparative and fair tests, making predictions and following a method accurately. covered optional x 5	methods, identifying variables and making predictions based on prior knowledge and understanding. covered x 4 optional x 2	methods, identifying and controlling variables, deciding on equipment and data to collect and making predictions based on prior knowledge and understanding. covered x 7
	Observation	AOL: World With support, observe, record and talk about materials and living things. covered x 10 optional x 14	Observe objects, materials, living things and changes over time, sorting and grouping them based on their features. covered x 4	Observe objects, materials, living things and changes over time, sorting and grouping them based on their features and explaining their reasoning. covered x 6	Make increasingly careful observations, identifying similarities, differences and changes and making simple connections. covered x 4 optional x 9	Begin to choose which observations to make and for how long and make systematic, careful observations and comparisons, identifying changes and connections. covered x 2 optional x 3	Within a group, decide which observations to make, when and for how long, and make systematic and careful observations, using them to make comparisons, identify changes, classify and make links between cause and effect. covered x 5	Independently decide which observations to make, when and for how long and make systematic and careful observations, using them to make comparisons, identify changes, classify and make links between cause and effect. optional

							optional	
Materials	**Identification and classification**	AOL: World Name and sort everyday items into groups of the same material. covered x 2	Identify and name what an object is made from, including wood, plastic, glass, metal, water and rock. covered optional	Observe what happens when a range of everyday materials, including foods, are heated and cooled, sorting and grouping them based on their observations.	Group and sort materials as being reflective or non-reflective. covered	Group and sort materials into solids, liquids or gases. covered	Compare and group everyday materials by their properties, including hardness, solubility, transparency, conductivity (electrical and thermal) and magnetism. covered optional Explain, following observation, that some substances (solutes) will dissolve in liquid (solvents) to form a solution and the solute can be recovered by evaporating off the solvent. covered	Investigate and identify good thermal insulators, describing their common features. Assign

	Properties and uses	AOL: World Identify that materials have different properties and explore and sort magnetic and non-magnetic materials through play and exploration. covered	Investigate and describe the simple physical properties of some everyday materials, such as hard or soft; stretchy or stiff; rough or smooth; opaque or transparent; bendy or rigid; waterproof or not waterproof and magnetic or non-magnetic. covered optional	Compare the suitability of a range of everyday materials for particular uses, including wood, metal, plastic, glass, brick, rock, paper and cardboard . covered	Compare and group rocks based on their appearance, properties or uses. covered optional x 3 Compare and group materials based on their magnetic properties. covered x 2	Describe materials as electrical conductors or insulators. covered x 2	Describe, using evidence from comparative or fair tests, why a material has been chosen for a specific use, including metals, wood and glass. covered optional Separate mixtures by filtering, sieving and evaporating. covered optional	Describe, using diagrams, how light behaves when reflected off a mirror (plane, convex or concave) and when passing through a lens (concave or convex). covered optional x 2
Nature	**Identification and classification**	AOL: World Begin to name and group plants and trees according to their observable features. covered x 3 optional x 2 AOL: World Match animals	Identify, compare, group and sort a variety of common wild and garden plants, including deciduous and evergreen trees, based on observable	Describe the basic life cycles of some familiar animals (egg, caterpillar, pupa, butterfly; egg, chick, chicken; spawn, tadpole, froglet, frog). covered x 4	Identify and group animals that have no skeleton, an internal skeleton (endoskeleton) and an external skeleton (exoskeleton). optional	Compare, sort and group living things from a range of environments, in a variety of ways, based on observable features and behaviour. covered x 2	Group and sort plants by how they reproduce. covered	Use and construct classification systems to identify animals and plants from a range of habitats. covered x 2 optional Classify living things,

		to their young. Assign	features. covered Identify, compare, group and sort a variety of common animals, including fish, amphibians, reptiles, birds, invertebrates and mammals, based on observable features. covered optional x 3	optional x 2 Identify and name a variety of plants and animals in a range of habitats and microhabitats. covered x 2 optional x 2				including microorganisms, animals and plants, into groups according to common observable characteristics and based on similarities and differences. covered x 3 optional
	Parts and functions	AOL: World Name and describe basic features of plants and trees. covered optional AOL: World Identify common features for different groups of	Label and describe the basic structure of a variety of common plants. covered Label and describe the basic structures of a variety of common animals, including fish,	Describe how plants need water, light and a suitable temperature to grow and stay healthy. covered x 2 optional x 3	Investigate how water is transported within plants. covered Name and describe the functions of the different parts of flowering plants (roots, stem, leaves and flowers). covered	Identify the four different types of teeth in humans and other animals, and describe their functions. covered x 3	Label and draw the parts of a flower involved in sexual reproduction in plants (stamen, filament, anther, pollen, carpel, stigma, style, ovary, ovule and sepal). covered	Identify that living things produce offspring of the same kind, although the offspring are not identical to either parent. covered x 2 Describe how animals and plants can be bred to

		animals, including wild and domestic animals. covered x 6 optional x 3	amphibians, reptiles, birds and mammals. covered x 2		optional			produce offspring with specific and desired characteristics (selective breeding). covered
	Nutrition	AOL: World Match animals to the foods that they eat. covered	Group and sort a variety of common animals based on the foods they eat. covered x 2	Interpret and construct simple food chains to describe how living things depend on each other as a source of food. covered	Compare and contrast the diets of different animals. covered x 5 optional x 2	Construct and interpret a variety of food chains and webs to show interdependence and how energy is passed on over time. covered optional	Describe, using their knowledge of food chains and webs, what could happen if a habitat had a living thing removed or introduced. covered	Explain that the circulatory system in animals transports oxygen, water and nutrients around the body. covered x 2 optional x 6
	Survival	AOL: World Describe some ways that plants or animals should be cared for in order for them to survive. covered x 5 optional x 4	Describe how to care for plants and animals, including pets. covered optional x 4	Explain how animals, including humans, need water, food, air and shelter to survive. covered x 2 optional	Describe the requirements of plants for life and growth (air, light, water, nutrients and room to grow) and how they vary from plant to plant.	Explain how adaptations help living things to survive in their habitat. covered x 2 optional	Describe the life process of reproduction in some plants and animals. covered	Identify how animals and plants are adapted to suit their environment, such as giraffes having long necks for feeding, and that

					covered			adaptations may lead to evolution. covered x 5 optional x 3
Place and space	**Habitats**	AOL: World Observe and describe living things and their habitats within the local environment. covered x 2 optional x 2	Observe the local environment throughout the year and ask and answer questions about living things and seasonal change. optional	Describe a range of local habitats and habitats beyond their locality (beaches, rainforests, deserts, oceans and mountains) and what all habitats provide for the things that live there. covered	Describe how environments can change due to natural influences and how living things need to be able to adapt to these changes.	Describe how environments can change due to human and natural influences and the impact this can have on living things. covered x 2 optional	Research and describe different farming practices in the UK and how these can have positive and negative effects on natural habitats. covered x 2	Research unfamiliar animals and plants from a range of habitats, deciding upon and explaining where they belong in the classification system. covered x 2 optional x 2
Comparison	**Physical things**	AOL: World Compare and group objects and materials according to simple given criteria. covered x 4 optional	Compare and group materials in a variety of ways, such as based on their physical properties; being natural or man-made and being	Compare and group things that are living, dead or have never been alive. covered	Investigate and compare a range of magnets (bar, horseshoe and floating) and explain that magnets have two poles (north and	Compare common household equipment and appliances that are and are not powered by electricity. covered	Compare the life cycles of animals, including a mammal, an amphibian, an insect and a bird. covered	Compare the living things in two contrasting areas of a habitat (top vs bottom of a hill, full sun vs shade, exposed location vs sheltered

			recyclable or non-recyclable. covered		south) and that opposite poles attract each other, while like poles repel each other. covered x 2 optional			location or well-trodden path vs unused area).
	Phenomena	AOL: World Make a shadow bigger or smaller using toys, play equipment and a light source. covered x 3 optional x 2	Compare shadows made by different objects and materials. covered	Compare the volume and pitch of sounds made by instruments, their voices or other objects. covered	Compare how objects move over surfaces made from different materials. covered optional	Compare how the volume of a sound changes at different distances from the source. covered	Compare and describe, using a range of toys, models and natural objects, the effects of water resistance, air resistance and friction. covered	Compare and give reasons for variations in how components in electrical circuits function (brightness of lamps; volume of buzzers and function of on or off switches). covered optional x 3
Change	**Living things**	AOL: World Explore the natural world around them and give simple descriptions, following	Describe, following observation, how plants and animals change over time.	Observe and describe how seeds and bulbs change over time as they grow into mature plants.	Draw and label the life cycle of a flowering plant. covered x 2	Explain how unfamiliar habitats, such as a mountain or ocean, can change over time and what	Describe the changes as humans develop from birth to old age. covered x 3 optional x 5	Explain that living things have changed over time, using specific examples and evidence.

		observation, of changes. covered x 6 optional		covered x 3 optional x 2		influences these changes. covered optional x 2		covered optional x 2