St Paul's C of E Academy
Science Skills

Aspect	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Human body	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.	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.	Describe the purpose of the digestive system, its main parts and each of their functions.	Describe the process of human reproduction.	Name and describe the purpose of the circulatory system and the functions of the heart, blood vessels and blood.

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Staying Safe	Follow instructions when in different environments and when handling simple equipment, such as scissors.	Describe ways to stay safe in some familiar situations.	Describe what humans need to survive.	Explain why light from the Sun can be dangerous.	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.

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Healthy lifestyle	Wash and dry hands regularly and say why this is important	Explain why hand washing and cleanliness are important.	Describe the importance of a healthy lifestyle, including exercise, a balanced diet, good quality sleep and personal hygiene.	Explain the importance and characteristics of a healthy, balanced diet.	Describe what damages teeth and how to look after them.	Explain why personal hygiene is important during puberty.	Explain the impact of positive and negative lifestyle choices on the body.

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Aspect	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Pattern Seeking	Notice and begin to describe patterns of weather in summer and winter.	Observe changes across the four seasons.	Describe typical UK seasonal weather patterns.	Find patterns in the way shadows change during the day.	Compare and find patterns in the pitch of a sound, using a range of equipment, such as musical instruments. Compare and find patterns in the volume of a sound, using a range of equipment, such as musical instruments.	Use the idea of Earth's rotation to explain day and night, and the Sun's apparent movement across the sky.	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.

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Changes	Notice and talk about the differences in day length between the seasons.	Observe and describe how day length changes across the year. covered	Describe how some objects and materials can be changed and how these changes can be desirable or undesirable.	Describe simply how fossils are formed, using words, pictures or a model.	Observe and explain that some materials change state when they are heated or cooled and measure or research the temperature in degrees Celsius (°C) at which materials change state	Identify, demonstrate and compare reversible and irreversible changes.	Describe some significant changes that have happened on Earth and the evidence, such as fossils, that support this.

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Earth	Describe simply how weather changes as the seasons change.	Observe and describe different types of weather.	Describe features of Earth using words and pictures.	Investigate soils from the local environment, making comparisons and identifying features.	Describe the water cycle using words or diagrams and explain the part played by evaporation and condensation.	Describe or model the movement of the Moon relative to Earth.	Identify that light travels in straight lines.

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Phenomena	Name and 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.			Describe the differences between dark and light and how we need light to be able to see. covered	Explain how sounds are made and heard using diagrams, models, written methods or verbally.	Describe the Sun, Earth and Moon as approximately spherical bodies and use this knowledge to understand the phases of the Moon and eclipses.	Describe, using scientific language, phenomena associated with refraction of light.

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Forces	Describe, predict and sort things that float and sink and talk about the forces that they can feel.	Investigate weather using toys, models or simple equipment.	Sort and group objects that float and sink.	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).	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.	Explain that objects fall to Earth due to the force of gravity.	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.

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Aspect	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Modelling	Explore and describe electrical and non- electrical light sources.	Describe, following exploration, what simple electrical circuits can do.	Make models with moving parts.	Make working models with simple mechanisms or electrical circuits.	Construct operational simple series circuits using a range of components and switches for control.	Describe and demonstrate how simple levers, gears and pulleys assist the movement of objects.	Create circuits using a range of components and record diagrammatically using the recognised symbols for electrical components.

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Report & conclude	Offer explanations for why things happen, making use of vocabulary, such as, because, then and next.	Talk about what they have done and say, with help, what they think they have found out.	Begin to notice patterns and relationships in their data and explain what they have done and found out using simple scientific language.	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.	. 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.	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.	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 questions and make predictions for what they might observe.

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Gather & record data	Record data in simple tables and pictograms.	With support, gather and record simple data in a range of ways (data tables, diagrams, Venn diagrams).	Use a range of methods (tables, charts, diagrams and Venn diagrams) to gather and record simple data with some accuracy.	Gather and record findings in a variety of ways (diagrams, tables, charts and graphs) with increasing accuracy.	Gather, record, classify and present observations and measurements in a variety of ways (pictorial representations, timelines, diagrams, keys, tables, charts and graphs).	Gather and record data and results of increasing complexity, selecting from a range of methods (scientific diagrams, labels, classification keys, tables, graphs and models).	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.

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Questioning	Ask a relevant scientific question to find out more, explain how things work and why they might happen.	Ask simple scientific questions.	Ask and answer scientific questions about the world around them.	Ask questions about the world around them and explain that they can be answered in different ways.	Ask relevant scientific questions, independently, about the world around them and begin to identify how they can answer them.	Ask a wide range of relevant scientific questions that broaden their understanding of the world around them and identify how they can answer them.	Ask and answer deeper and broader scientific questions about the local and wider world that build on and extend their own and others' experiences and knowledge.

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Measurement	With support, use simple equipment, such as timers, rulers and containers, to measure length, height, capacity and time.	With support, use simple equipment to measure and make observations.	Use simple equipment to measure and make observations.	Take measurements in standard units, using a range of simple equipment.	Take accurate measurements in standard units, using a range of equipment.	Take increasingly accurate measurements in standard units, using a range of chosen equipment.	Take accurate, precise and repeated measurements in standard units, using a range of chosen equipment.

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Aspect	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Observation	With support, observe, record and talk about materials and living things.	Observe objects, materials, living things and changes over time, sorting and grouping them based on their features.	Observe objects, materials, living things and changes over time, sorting and grouping them based on their features and explaining their reasoning.	Make increasingly careful observations, identifying similarities, differences and changes and making simple connections.	Begin to choose which observations to make and for how long and make systematic, careful observations and comparisons, identifying changes and connections.	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.	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.

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Identification and classification	Name and sort everyday items into groups of the same material.	Identify and name what an object is made from, including wood, plastic, glass, metal, water and rock.	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.	Group and sort materials into solids, liquids or gases.	Compare and group everyday materials by their properties, including hardness, solubility, transparency, conductivity (electrical and thermal) and magnetism. 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.	Investigate and identify good thermal insulators, describing their common features.

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Properties and	Identify that materials have different properties, explore, and sort magnetic and non-magnetic materials through play and exploration.	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	Compare the suitability of a range of everyday materials for particular uses, including wood, metal, plastic, glass, brick, rock, paper and cardboard .	Compare and group materials based on their magnetic properties.	Describe materials as electrical conductors or insulators.	Describe, using evidence from comparative or fair tests, why a material has been chosen for a specific use, including metals, wood and glass. Separate mixtures by filtering, sieving and evaporating.	Describe, using diagrams, how light behaves when reflected off a mirror (plane, convex or concave) and when passing through a lens (concave or convex).

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Identification and classification	Begin to name and group plants and trees according to their observable features. Match animals to their young.	Identify, compare, group and sort a variety of common wild and garden plants, including deciduous and evergreen trees, based on observable features. Identify, compare, group and sort a variety of common animals, including fish, amphibians, reptiles, birds, invertebrates and mammals, based on observable features.	Describe the basic life cycles of some familiar animals (egg, caterpillar, pupa, butterfly; egg, chick, chicken; spawn, tadpole, froglet, frog). Identify and name a variety of plants and animals in a range of habitats and microhabitats.	Identify and group animals that have no skeleton, an internal skeleton (endoskeleton) and an external skeleton (exoskeleton).	Compare, sort and group living things from a range of environments, in a variety of ways, based on observable features and behaviour.	Group and sort plants by how they reproduce.	Use and construct classification systems to identify animals and plants from a range of habitats. Classify living things, including microorganisms, animals and plants, into groups according to common observable characteristics and based on similarities and differences.

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Aspect	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Parts & function	Name and describe basic features of plants and trees. Identify common features for different groups of animals, including wild and domestic animals.	Label and describe the basic structure of a variety of common plants. Label and describe the basic structures of a variety of common animals, including fish, amphibians, reptiles, birds and mammals.	Describe how plants need water, light and a suitable temperature to grow and stay healthy.	Investigate how water is transported within plants. Name and describe the functions of the different parts of flowering plants (roots, stem, leaves and flowers).	Identify the four different types of teeth in humans and other animals, and describe their functions.	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).	Identify that living things produce offspring of the same kind, although the offspring are not identical to either parent. Describe how animals and plants can be bred to produce offspring with specific and desired characteristics (selective breeding). covered

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Nutrition	Match animals to the foods that they eat.	Group and sort a variety of common animals based on the foods they eat.	Interpret and construct simple food chains to describe how living things depend on each other as a source of food.	Compare and contrast the diets of different animals.	Construct and interpret a variety of food chains and webs to show interdependence and how energy is passed on over time.	Describe, using their knowledge of food chains and webs, what could happen if a habitat had a living thing removed or introduced.	Explain that the circulatory system in animals transports oxygen, water and nutrients around the body.

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Aspect	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Survival	Describe some ways that plants or animals should be cared for in order for them to survive.	Describe how to care for plants and animals, including pets.	Explain how animals, including humans, need water, food, air and shelter to survive.	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.	Describe the life process of reproduction in some plants and animals.	Identify how animals and plants are adapted to suit their environment, such as giraffes having long necks for feeding, and that adaptations may lead to evolution.

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Aspect	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Habitats	Observe and describe living things and their habitats within the local environment.	Observe the local environment throughout the year and ask and answer questions about living things and seasonal change.	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.	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.	Research and describe different farming practices in the UK and how these can have positive and negative effects on natural habitats.	Research unfamiliar animals and plants from a range of habitats, deciding upon and explaining where they belong in the classification system.

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Physical things	Compare and group objects and materials according to simple given criteria.	Compare and group materials in a variety of ways, such as based on their physical properties; being natural or man-made and being recyclable or non-recyclable.	Compare and group things that are living, dead or have never been alive.	Investigate and compare a range of magnets (bar, horseshoe and floating) and explain that magnets have two poles (north and south) and that opposite poles attract each other, while like poles repel each other.	Compare common household equipment and appliances that are and are not powered by electricity.	Compare the life cycles of animals, including a mammal, an amphibian, an insect and a bird.	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 location or well-trodden path vs unused area).

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Phenomena	Make a shadow bigger or smaller using toys, play equipment and a light source.	Compare shadows made by different objects and materials. covered	Compare the volume and pitch of sounds made by instruments, their voices or other objects.	Compare how objects move over surfaces made from different materials.	Compare how the volume of a sound changes at different distances from the source. covered x 2	Compare and describe, using a range of toys, models and natural objects, the effects of water resistance, air resistance and friction.	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).

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Aspect	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Living things	Explore the natural world around them and give simple descriptions, following observation, of changes.	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.	Explain how unfamiliar habitats, such as a mountain or ocean, can change over time and what influences these changes.	Describe the changes as humans develop from birth to old age.	Explain that living things have changed over time, using specific examples and evidence.