	Pre-School	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Working scientifically: Asking Questions	**Understanding the world:** Use all their senses in hands-on exploration of natural materials. Explore collections of materials with similar and/or different properties. Talk about what they see, using a wide vocabulary. Explore how things work. Plant seeds and care for growing plants. Understand the key features of the life cycle of a plant and an animal. Begin to understand the need to respect and care for the natural environment and all living things. Explore and talk about different forces they can feel. Talk about the differences between materials and changes they notice. Note: Some aspects of their learning is child-led, linked to their specific interests - teachers skillfully weave in the content around these interests.	**Understanding the 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. Children-led sientific learning focuses on the following core areas: - Natural processes (leaves, ice and weather); - Life cycles (butterflies); - Exploring the natural world. Some aspects of their learning is child-led, linked to their specific interests - teachers skillfully weave in the content around these interests.	Ask simple questions about what they notice (weather, plants, light).	Ask questions about the suitability of materials.	Ask relevant questions (magnets, shadows, nutrition).	Develop comparative questions (pitch, circuits, teeth shape/function).	Ask deeper explanatory questions (materials, forces, Earth & Space).	Refine scientific questions; research-based enquiries (evolution and inheritance).
Working scientifically: Planning and Testing			Perform simple tests with support.	Compare materials; simple comparative tests.	Plan simple fair tests (friction ramps, shadow investigation).	Construct circuits; test conductors; identify complete loops.	Plan fair tests independently; control variables emerging.	Identify variables; investigate voltage & resistance; design circuits.
Working scientifically: Observing and Measuring			Observe closely using simple equipment (weather station, plant growth).	Observe changes (bending, twisting, squashing).	Measure (e.g. shadow length); systematic observation.	More accurate observation (change of state linked to temperature); pattern seeking (features of instruments and pitch).	Measure temperature over time; use data loggers.	Accurate measurement (light/shadow); compare multiple variables.
Working scientifically: Recording			Drawings, simple tables, sorting.	Use charts, labelled diagrams.	Complete tables, labelled diagrams.	Diagrams (non-symbolic circuits), tables, temperatures.	Line graphs, systematic tables.	Scientific diagrams using recognised symbols.
Working scientifically: Concluding and explaining			Describe what happened using simple scientific vocabulary.	Explain why a material is suitable.	Use results to answer questions; identify patterns.	Explain cause and effect (vibration, complete circuit).	Draw conclusions using evidence; explain reversible/irreversible change.	Justify conclusions using scientific reasoning; explain variation scientifically.
Program of study: Plants			Identify wild & garden plants. Name basic parts of a plant (flower, leaf, stem, roots). Understand the difference between deciduous and evergreen trees.	Identify more complex parts of a plant (stamen, styles, staple). Understand how seeds & bulbs grow into mature plants. Investigate what plants need to grow and be healthy: water, light, suitable temperature. NOTE: this is a Year 3 objective, moved to Year 2.			Investigate the life cycle of flowering plants. Understand the pollination process. Compare different seed dispersal processes.	Investigate how water and nutrients are transported in plants.
Program of study: Animals incl humans			Name body parts & senses. Classify animals into groups.	Understand the basic needs for survival, growth and repair. Describe the importance for humans of exercise, eating the right types of foods and good hygiene.	Understand that animals obtain nutrition from food. Compare and contrast different nutrition groups. Understand what makes a balanced diet. Investigate the function of skeletons & muscles.	Describe the simple functions of the basic parts of the digestive system in humans. Identify the different types of teeth in humans and compare their simple functions. Construct and interpret a variety of food chains, identifying producers, consumers, predators and prey.	Describe the changes as humans develop to old age.	Identify and name the main parts of the human circulatory system. Describe the functions of the heart, blood vessels and blood. Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. Describe the ways in which nutrients and water are transported within animals, including humans. Understand the nutrient and oxygen transportation process in the circulatory system.
Program of study: Materials / States of matter / Changes of state			Identify everyday materials and simple properties.	Compare suitability of materials for a particular function (job uniforms). Change shape of materials by bending, twisting, stretching.		Compare and group materials together, according to whether they are solids, liquids or gases. Observe changes of state when water is heated or cooled. Measure the temperature at which this happens. Identify the part played by evaporation and condensation in the water cycle.	Compare and group together everyday materials on the basis of their properties (hardness, solubility, transparency, conductivity and response to magnets). Investigate which materials dissolve in liquid to form a solution. Recover a substance from a solution. Separate mixtures through filtering, sieving and evaporating. Compare reversible and irreversible changes of state.	

Program of study: Seasonal changes	Observe changes every day/week, across the 4 seasons. Observe and describe weather associated with the seasons and how day length varies.					
Program of study: Living things & their habitats		Explore and compare the differences between things that are living, dead, and things that have never been alive. Identify living things live in habitats to which they are suited: explore a range of different habitats (including desert, arctic, ocean, rainforest and micro-habitats) and the features of animals that live there. 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. Recognise that environments can change and that this can sometimes pose dangers to living things. (arctic, woodland, rainforests, ocean and beach envionments).		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. Classify plants and animals based on specific characteristics. Investigate the significance of the work of Carl Linnaeus in classification.
Program of study: Rocks			Compare properties of rocks. Understand how different rock types have been formed: igneous, metamorphic and sedimentary. Understand fossil formation. Investigate soil composition.			
Program of study: Light			Understand that we need light to see. Observe that light reflects off surfaces; compare the reflective properties of different materials. Understand that shadows are formed by opaque objects. Measure and find patterns in the way shadow size changes. Recognise that light from the sun can be dangerous andi identify ways to protect our eyes.			Investigate that light travels in straight lines. Understand that we see things when light reflects off objects into the eye. Identify that shadows match their object shape and investigate how angle affects shadow size.
Program of study: Forces & magnets			Investigate push & pull forces, magnetic attraction and repulsion. Identify that magnets have 2 poles and test which poles attract or repel one another. Test a range of materials for their magnetic or non-magnetic properties. Understand friction and compare how objects move on different surfaces (buggies and ramps).		Understand that objects fall towards the Earth because of the force of gravity. Identify and test the effects of air resistance, water resistance and friction (Eggnauts). Recognise and test mechanisms (levers, pulleys and gears) that allow a smaller force to have a greater effect.	
Program of study: Sound				Test and observe a range of musical instruments to identify that vibrations produce sound. Understand that sound travels through a medium: identify that this could be a solid, liquid or gas. 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.		

Program of study: Electricity						Construct simple series circuits (complete loop) to light up bulbs and power motors. Create diagrams of a simple circuit (non-symbolic). Test a range of materials for their conductive properties, identifying conductors and insulators. Create switches that open and close circuits. Apply learning to light up a Robot (link to DT).		Create scientific diagrams of a simple circuit using recognised symbols. Compare the brightness of a lamp 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 and the loudness of buzzers. Apply learning to create a pressure-sensored burgular alarm (link to DT).
Program of study: Earth & space							Describe the movement of the Earth and other planets relative to the sun in the solar system (fruits representing planet sizes and distances). Describe the movement of the moon relative to the Earth and observe pictures of the phases of the moon. Identify that the sun, Earth and moon are spherical bodies (compare flat versus spherical models). Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.	
Program of study: Evolution & 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 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. Complete independent investigations linked to evolutionary changes.

END OF KS2 EXPECTATION:

By the end of Year 6, pupils can:
- Plan and conduct fair tests independently.
- Identify independent, dependent and control variables
- Record using scientific diagrams and recognised symbols
- Explain findings using scientific vocabulary
- Justify conclusions with evidence
- Apply knowledge across units (e.g. electrical circuits in DT projects)