

Westgate CP School and Nursery Progression of Skills: Science



The document below has been designed to show how we will cover all of the relevant Scientific knowledge and skills across our school. The context in which these are taught is left to the discretion of teachers, where possible trying to match the content of their unit to their year group's termly topic.

EYFS - We have selected the Early Learning Goals that link most closely to the History National Curriculum	
Understanding the World (The World)	Physical Development (Health and Self-Care)
<ul style="list-style-type: none">• 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 make observations of animals and plants and explain why some things occur, and talk about changes.	<ul style="list-style-type: none">• Children know the importance for good health of physical exercise, and a healthy diet, and talk about ways to keep healthy and safe.

KS1 - Working Scientifically
<p>During years 1 and 2, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:</p> <ul style="list-style-type: none">• asking simple questions and recognising that they can be answered in different ways;• observing closely, using simple equipment;• performing simple tests;• identifying and classifying;• using their observations and ideas to suggest answers to questions;• gathering and recording data to help in answering questions.

LKS2 Working Scientifically	KS2 National Curriculum Expectations
<p>Pupils should be taught to use the following practical scientific methods, processes and skills:</p> <ul style="list-style-type: none"> • asking relevant questions and using different types of scientific enquiries to answer them; • setting up simple practical enquiries, comparative and fair tests; • making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers; • gathering, recording, classifying and presenting data in a variety of ways to help in answering questions; • recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables; • reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions; • using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions; • identifying differences, similarities or changes related to simple scientific ideas and processes; • using straightforward scientific evidence to answer questions or to support their findings. 	<p>Pupils should be taught to use the following practical scientific methods, processes and skills:</p> <ul style="list-style-type: none"> • planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary; • taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate; • recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs; • using test results to make predictions to set up further comparative and fair tests; • reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations; <p>identifying scientific evidence that has been used to support or refute ideas or arguments.</p>

Yr	Working Scientifically	Scientific Knowledge
1	<ul style="list-style-type: none"> • Explore the world around them and raise their own simple questions • Experience different types of science enquiries, including practical activities • Begin to recognise different ways in which they might answer scientific questions • Carry out simple tests • Use simple features to compare objects, materials and living things and, with help decide how to sort and group them (identifying and classifying) • Ask people questions and use simple secondary sources to find answers • Observe closely using simple equipment with help, observe changes over time • With guidance, they should begin to notice patterns and relationships • Use simple measurements and equipment (e.g. hand lenses, egg timers) to gather data • Record simple data • Use their observations and ideas to suggest answers to questions. Talk about what they have found out and how they found it out • With help, they should record and communicate their findings in a range of ways and begin to use simple scientific language 	<ul style="list-style-type: none"> • 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 • Animals, including humans 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 Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets) Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. • Everyday materials 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
2		<ul style="list-style-type: none"> • 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, and identify and name different sources of food

		<ul style="list-style-type: none"> • Plants 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 • Animals, including humans 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) Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene • Everyday materials 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
3	<ul style="list-style-type: none"> • Raise their own relevant questions about the world around them • Should be given a range of scientific experiences including different types of science enquiries to answer questions • Start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions • Set up simple practical enquiries, comparative and fair tests. 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 • Recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations • Make systematic and careful observations. 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. 	<ul style="list-style-type: none"> • Plants 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 • Animals, including humans 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, protection and movement • Rocks Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties and simple physical properties

	<ul style="list-style-type: none"> • Begin to look for naturally occurring patterns and relationships and decide what data to collect to identify them. • Take accurate measurements using standard units. Learn how to use a range of (new) equipment, such as data loggers/thermometers appropriately. • Collect and record data from their own observations and measurements in a variety of ways: notes, bar charts and tables, standard units, drawings, labelled diagrams, keys and help to make decisions about how to analyse this data • With help, pupils should look for changes, patterns, similarities and differences in their data in order to draw simple conclusions and answer questions • Use relevant simple scientific language to discuss their ideas and communicate their findings in ways that are appropriate for different audiences, including oral and written explanations, displays or presentations of results and conclusions • 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. 	<p>Describe in simple terms how fossils are formed when things that have lived are trapped within rock</p> <p>Recognise that soils are made from rocks and organic matter</p> <ul style="list-style-type: none"> • Light <p>Recognise that they need light in order to see things and that dark is the absence of light</p> <p>Notice that light is reflected from surfaces</p> <p>Recognise that light from the sun can be dangerous and that there are ways to protect their eyes</p> <p>Recognise that shadows are formed when the light from a light source is blocked by an opaque object</p> <p>Find patterns in the way that the size</p> <ul style="list-style-type: none"> • Forces and magnets <p>Compare how things move on different surfaces</p> <p>Notice that some forces need contact between two objects, but magnetic forces can act at a distance</p> <p>Observe how magnets attract or repel each other and attract some materials and not others</p> <p>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</p> <p>Describe magnets as having two poles</p> <p>Predict whether two magnets will attract or repel each other, depending on which poles are facing</p>
4		<ul style="list-style-type: none"> • Living things and their habitats <p>Recognise that living things can be grouped in a variety of ways</p> <p>Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment</p> <p>Recognise that environments can change and that this can sometimes pose dangers to living things</p> <ul style="list-style-type: none"> • Animals, including humans <p>Describe the simple functions of the basic parts of the digestive system in humans</p> <p>Identify the different types of teeth in humans and their simple functions</p> <p>Construct and interpret a variety of food chains, identifying producers, predators and prey</p>

		<ul style="list-style-type: none"> • States of matter Compare and group materials together, according to whether they 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 (°C) Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature • 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 • 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 and insulators, and associate metals with being good conductors
5	<ul style="list-style-type: none"> • Use their science experiences to explore ideas and raise different kinds of questions • Talk about how scientific ideas have developed over time • Select and plan the most appropriate type of scientific enquiry to use to answer questions • Recognise when and how to set up comparative and fair tests and explain which variables need to be controlled and why • 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 • Recognise which secondary sources will be the most useful to research their ideas and begin to separate opinion from fact • Make their own decisions about what observations to make, what measurements to use and how long to make them for 	<ul style="list-style-type: none"> • Living things and their habitats Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird Describe the life process of reproduction in some plants and animals • Animals, including humans Describe the changes as humans develop to old age • Properties and changes 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 substance from a solution Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating

	<ul style="list-style-type: none"> • Look for different causal relationships in their data and identify evidence that refutes or supports their ideas • Choose the most appropriate equipment to make measurements with increasing precision and explain how to use it accurately. Take repeat measurements where appropriate. • Decide how to record data and results of increasing complexity from a choice of familiar approaches: scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs • Identify scientific evidence that has been used to support or refute ideas or arguments • Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas • Use oral and written forms such as displays and other presentations to report conclusions, causal relationships and explanations of degree of trust in results • Use their results to make predictions and identify when further observations, comparative and fair tests might be needed 	<p>Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic</p> <p>Demonstrate that dissolving, mixing and changes of state are reversible changes</p> <p>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</p> <ul style="list-style-type: none"> • Earth and space <p>Describe the movement of the Earth, and other planets, relative to the Sun in the solar system</p> <p>Describe the movement of the Moon relative to the Earth</p> <p>Describe the Sun, Earth and Moon as approximately spherical bodies</p> <p>Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky</p> <ul style="list-style-type: none"> • Forces <p>Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object</p> <p>Identify the effects of air resistance, water resistance and friction, that act between moving surfaces</p> <p>Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect</p>
6		<ul style="list-style-type: none"> • Living things and their habitats <p>Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals</p> <p>Give reasons for classifying plants and animals based on specific characteristics</p> <ul style="list-style-type: none"> • Animals including humans <p>Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood</p> <p>Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function</p> <p>Describe the ways in which nutrients and water are transported within animals, including humans</p> <ul style="list-style-type: none"> • 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 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

- **Light**

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

- **Electricity**

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