

Science Overview and Progression

Disciplinary Knowledge - Working Scientifically							
	Early years	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Asking Questions	<ul style="list-style-type: none"> Show curiosity, ask “how?” and “why?” questions about what they notice. Ask adults questions to find out more and to check understanding. 	<ul style="list-style-type: none"> Ask simple questions. 	<ul style="list-style-type: none"> Ask simple questions and recognise that they can be answered in different ways. 	<ul style="list-style-type: none"> Ask questions and understand there are different enquiry types they could use to answer them. 	<ul style="list-style-type: none"> Ask relevant questions and use different types of scientific enquiry to answer them. 	<ul style="list-style-type: none"> Ask scientific questions and begin to understand which questions would be best suited to each enquiry type. 	<ul style="list-style-type: none"> Ask relevant scientific questions and choose which enquiry type would be best suited to answer them.
Plan	<ul style="list-style-type: none"> Talk about what might happen (simple prediction) before they explore. Suggest what resources they need and how they will find things out. 	<ul style="list-style-type: none"> Verbally state what they are going to investigate. 	<ul style="list-style-type: none"> Make simple predictions based on a question. Identify what they will change and keep the same. 	<ul style="list-style-type: none"> Make relevant predictions. Identify what they will change, observe and keep the same. With support, set up simple practical enquiries. 	<ul style="list-style-type: none"> Make predictions based on simple scientific knowledge. Identify what they will change, observe or measure and keep the same. Set up simple practical enquiries, comparative and fair tests. 	<ul style="list-style-type: none"> Make predictions based on scientific knowledge. With support, plan different types of scientific enquiry. Where appropriate, identify the dependent, independent and controlled variables. 	<ul style="list-style-type: none"> Make predictions based on scientific knowledge. Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.
Make Observations	<ul style="list-style-type: none"> Closely observe plants, animals, natural objects and changes over time. Use senses (look, listen, touch, smell, sometimes taste – e.g. herbs) to notice detail. 	<ul style="list-style-type: none"> Observe closely. 	<ul style="list-style-type: none"> Observe closely, using simple equipment. 	<ul style="list-style-type: none"> Begin to use scientific equipment to make observations.. 	<ul style="list-style-type: none"> Make systematic and careful observations. 	<ul style="list-style-type: none"> Use a range of scientific equipment to make systematic and careful observations. 	<ul style="list-style-type: none"> Use a range of scientific equipment to make systematic and careful observations with increased complexity.
Take Measurements	<ul style="list-style-type: none"> Use everyday language to compare size, length, weight and capacity (“longer than...”, “holds more...”). Begin to use non-standard units (blocks, hands, cups) when exploring. 	<ul style="list-style-type: none"> Carry out simple tests using nonstandard measurements when appropriate. 	<ul style="list-style-type: none"> Perform simple tests using standard units when appropriate. 	<ul style="list-style-type: none"> Carry out tests and simple experiments and take measurements using standard units. 	<ul style="list-style-type: none"> Take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. 	<ul style="list-style-type: none"> Take accurate measurements using a range of scientific equipment. Start to take repeat readings when appropriate. 	<ul style="list-style-type: none"> Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.
Gather, Record and Classify Data	<ul style="list-style-type: none"> Sort and match objects / living things into groups they choose or that an adult suggests. Begin simple tally marks or pictorial records with adult modelling. 	<ul style="list-style-type: none"> Gather and record simple data. Sort objects and living things into groups based on simple properties. 	<ul style="list-style-type: none"> Gather and record data to help in answering questions. Identifying and classifying. 	<ul style="list-style-type: none"> Gather and record data in different ways to help answer questions. Recording findings using simple scientific language, drawings, labelled diagrams, bar charts, and tables. 	<ul style="list-style-type: none"> Gather, record and classify data in a variety of ways to help in answering questions. Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables. 	<ul style="list-style-type: none"> Gather, record and classify data with increasing complexity to help in answering questions. Record data using scientific diagrams and labels, classification keys, tables, bar and line graphs. 	<ul style="list-style-type: none"> Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.
Present Findings	<ul style="list-style-type: none"> Describe what they noticed using full sentences and new vocabulary. Explain to a peer or adult what happened in their exploration. 	<ul style="list-style-type: none"> Explain what they found out to an adult or a partner. 	<ul style="list-style-type: none"> Talk about what they have found out and how they found it out. 	<ul style="list-style-type: none"> Report on findings from enquiries, including oral and written explanations. 	<ul style="list-style-type: none"> Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. 	<ul style="list-style-type: none"> Report and present findings from enquiries, including conclusions. 	<ul style="list-style-type: none"> Report and present 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.
Answer Question and Make Conclusions	<ul style="list-style-type: none"> Link new experiences to what they already know (“The ice melted because it got warm”). Offer simple explanations based on their observations. 	<ul style="list-style-type: none"> Answer simple questions. 	<ul style="list-style-type: none"> Use their observations and ideas to suggest answers to questions. 	<ul style="list-style-type: none"> Make simple conclusions. Use results, findings or observations to answer questions. 	<ul style="list-style-type: none"> Use straightforward scientific evidence to answer questions or to support their findings. Use results to draw simple conclusions. Begin to identify differences, similarities or changes related to simple ideas or processes. 	<ul style="list-style-type: none"> Use scientific evidence to answer questions. Make conclusions based on scientific evidence and from their own testing and findings. Identify differences, similarities or changes related to simple ideas or processes. 	<ul style="list-style-type: none"> Use scientific evidence to answer questions. Make conclusions based on scientific evidence and from their own testing and findings. Identify scientific evidence that has been used to support or refute ideas or arguments.

Science Overview and Progression

Evaluate	<ul style="list-style-type: none"> Suggest what else they could test or change next time. Talk about whether their idea worked and how they might improve it. 			<ul style="list-style-type: none"> Suggest questions for further investigation. 	<ul style="list-style-type: none"> Begin to make predictions for new values, suggest improvements and raise further questions. 	<ul style="list-style-type: none"> Make predictions for new values, suggest improvements and raise further questions. 	<ul style="list-style-type: none"> Use test results to make predictions to set up further comparative and fair tests. Suggest investigation improvements including accuracy of results. Provide some simple examples of how to extend the investigation.
-----------------	---	--	--	--	---	--	---

Substantive Knowledge - knowing scientific concepts							
Scientific Domain	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Animals, including humans	<ul style="list-style-type: none"> Name common animals and know the sounds they make. Talk about features that help animals live in different places (e.g. fins for swimming). Know humans grow from babies to adults and need food, water, sleep and exercise to stay healthy. Identify basic body parts and the five senses. 	<ul style="list-style-type: none"> Identify and name a variety of 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 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Describe the changes as humans develop to old age 	<ul style="list-style-type: none"> 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 Describe the ways in which nutrients and water are transported within animals, including humans
Living things and their habitats	<ul style="list-style-type: none"> Recognise living things grow, move and need food/water Explore micro-habitats (under logs, in soil) and larger habitats (pond, meadow). 		<ul style="list-style-type: none"> 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 n 		<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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 Give reasons for classifying plants and animals based on specific characteristics

Science Overview and Progression

Plants	<ul style="list-style-type: none"> • Name some common garden and wild plants, trees and seasonal changes. • Observe seed to seedling growth and know plants need light, water and time to grow. • Identify basic parts: root, stem/trunk, leaf, flower/petal. 	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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 			
Materials	<ul style="list-style-type: none"> • Explore and name everyday materials: wood, metal, plastic, fabric etc. • Describe simple properties (hard/soft, stretchy, waterproof, transparent). • Notice materials can change when bent, stretched, heated or cooled. 	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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 			<ul style="list-style-type: none"> • 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 • 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 • 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 	

Science Overview and Progression

						the action of acid on bicarbonate of soda	
Rocks					<ul style="list-style-type: none"> • Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties • Describe in simple terms how fossils are formed when things that have lived are trapped within rock • Recognise that soils are made from rocks and organic matter 		
States of Matter	<ul style="list-style-type: none"> • Observe ice melting and water evaporating (puddles drying). • Use words like melt, freeze, steam. 				<ul style="list-style-type: none"> • 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 		
Electricity					<ul style="list-style-type: none"> • 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 		<ul style="list-style-type: none"> • 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

Science Overview and Progression

Earth and Space	<ul style="list-style-type: none"> Recognise the Sun during the day and the Moon and stars at night. Talk about day and night routines. 					<ul style="list-style-type: none"> 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 night and the apparent movement of the sun across the sky 	
Seasonal Changes	<ul style="list-style-type: none"> Observe and describe daily and seasonal weather patterns; know day length varies. Talk about appropriate clothing and activities for different seasons. 	<ul style="list-style-type: none"> Observe changes across the 4 seasons Observe and describe weather associated with the seasons and how day length varies 					
Sound	<ul style="list-style-type: none"> Investigate how different objects make sounds and how sounds can be louder/softer. 				<ul style="list-style-type: none"> Identify how sounds are made, associating some of them with something vibrating Recognise that vibrations from sounds travel through a medium to the ear <ul style="list-style-type: none"> 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 Recognise that sounds get fainter as the distance from the sound source increases 		
Light	<ul style="list-style-type: none"> Notice that we need light to see; identify light sources (sun, torch). Explore shadows in outdoor play. 			<ul style="list-style-type: none"> 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 <ul style="list-style-type: none"> 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 that the size of shadows change 		<ul style="list-style-type: none"> Recognise that light travels 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 	

Science Overview and Progression

Forces and Magnets	<ul style="list-style-type: none"> • Explore pushes and pulls; notice how surfaces affect the speed of toy vehicles. • Experience the attraction/repulsion of magnets through play. 			<ul style="list-style-type: none"> • Compare how things move on different surfaces • Notice that some forces need contact between 2 objects, but magnetic forces can act at a distance • Observe how magnets attract or repel each other and attract some materials and not others • 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 2 poles • predict whether 2 magnets will attract or repel each other, depending on which poles are facing 		<ul style="list-style-type: none"> • Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object • Identify the effects of air resistance, water 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 	
Evolution and Inheritance						<ul style="list-style-type: none"> •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 	