

Science Progression of Skills

This document outlines the progression of skills and knowledge in the subject of science at Edith Cavell Primary.

The statements for KS1, LKS2 and UKS2 are taken from the National Curriculum. Where objectives for EYFS can be linked to the National Curriculum for science, these have been included and have been taken from the 'Development Matters' document.

Part 1 – Scientific Enquiry Skills

The first part of this document has been divided into four main sections:

- Asking Questions and Planning Investigations;
- Measuring and Recording;
- Concluding;
- Evaluating

These skills have been identified as the most relevant for pupils when following lines of scientific enquiry.

The skills shown are not assigned to a specific year (A or B). Class teachers will endeavour to give pupils the opportunity to develop every skill each year, linking to the knowledge for each topic where appropriate. Statements shown in blue text highlight in more detail the learning which will have been undertaken before a pupil moves to the next key stage.

Part 2 – Scientific Knowledge and Understanding

At Edith Cavell we operate on an A/B year timetable. When a child finishes a particular key stage, they will have been taught all of the relevant National Curriculum statements and will be ready to move onto the learning for the following key stage. Where an objective is covered in our year A timetable, it has been identified in green, and where an objective is covered in in year B, it has been identified in purple. Areas filled grey indicate that the subject area is not covered in that particular key stage.

In UKS2, there are three objectives which are visited yearly, in order to tie in with our RSE and PSHE schemes of work These are:

Animals Including Humans

- Describe the changes as humans develop to old age

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

When organising KS1 and KS2 science topics to either year A or Year B, the science lead has considered where cross-curricular links may be made. In many cases, the knowledge and experiences gained in science will relate to the overall learning for that term. Further information relating to the coverage of core and foundation subjects can be found on our Rolling Programme, or on individual skills progression maps.

Part 1: Scientific Enquiry Skills

	EYFS		KS1	LKS2	UKS2
	Nursery & Reception		Year 1 & Year 2	Year 3 & Year 4	Year 5 & Year 6
	30-50 months	40-60 months	Covered in both year A and Year B	Covered in both year A and Year B	Covered in both year A and Year B
Asking Questions and Planning Investigations	<p>Questions why things happen.</p> <p>Beginning to understand 'why' and 'how' questions.</p> <p>Can select and use activities and resources with help.</p> <p>Understands use of objects (e.g. "What do we use to cut things?")</p>	<p>Explains own knowledge and understanding, and asks appropriate questions of others.</p>	<p>N.C: Asking simple questions and recognising that they can be answered in different ways.</p>	<p>N.C: Asking relevant questions and using different types of scientific enquiries* to answer them.</p> <p>*The five enquiry types are:</p> <ul style="list-style-type: none"> • Observation over time; • Pattern seeking; • Identifying, classifying and grouping; • Comparative and fair testing; • Research using secondary sources. <p>N.C: Setting up simple practical enquiries, comparative and fair tests</p> <p>Start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions;</p> <p>Recognise when a simple fair test is necessary and help to decide how to set it up.</p>	<p>N.C: Plan different types of scientific enquiries* to answer questions, including recognising and controlling variables where necessary.</p> <p>*The five enquiry types are:</p> <ul style="list-style-type: none"> • Observation over time; • Pattern seeking; • Identifying, classifying and grouping; • Comparative and fair testing; • Research using secondary sources. <p>Explore ideas and raise different kinds of questions;</p> <p>Make decisions about what observations to make, what measurements to use and how long to make them for – recognising that there may be a need to repeat results;</p> <p>Recognise when and how to set up comparative and fair tests and explain which variables need to be controlled and why;</p> <p>Recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact.</p>

<p>Measuring and Recording</p>	<p>Enjoys responsibility of carrying out small tasks.</p> <p>Is able to follow directions (if not intently focused on own choice of activity).</p> <p>Shows an interest in technological toys with knobs or pulleys, or real objects such as cameras or mobile phones.</p> <p>Shows skill in making toys work by pressing parts or lifting flaps to achieve effects such as sound, movements or new images.</p> <p>Knows that information can be retrieved from computers.</p>	<p>Responds to instructions involving a two-part sequence.</p> <p>Extends vocabulary, especially by grouping and naming, exploring the meaning and sounds of new words.</p> <p>Shows understanding of the need for safety when tackling new challenges, and considers and manages some risks.</p> <p>Shows understanding of how to transport and store equipment safely.</p> <p>Practices some appropriate safety measures without direct supervision.</p> <p>Uses everyday language related to time.</p> <p>Measures short periods of time in simple ways.</p> <p>Knows that information can be retrieved from books and computers.</p> <p>Uses ICT hardware to interact with age-appropriate computer software.</p>	<p>N.C: Observing closely, using simple equipment.</p> <p>N.C: Performing simple tests.</p> <p>N.C: Gathering and recording data to help in answering questions.</p> <p>N.C: Identifying and classifying (as part of a line of scientific enquiry)</p> <p>Experience different types of scientific enquiries;</p> <p>Use simple features to compare objects, materials and living things, and, with help, decide how to sort and group them;</p> <p>With help, observe changes over time, and, with guidance, begin to notice patterns and relationships;</p> <p>Use simple measurements and equipment (for example, hand lenses, egg timers) to gather data, carry out simple tests, record simple data, and talk about what they have found out and how they found it out;</p> <p>With help, record and communicate their findings in a range of ways and begin to use simple scientific language.</p>	<p>N.C: Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.</p> <p>N.C: Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions.</p> <p>N.C: Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.</p> <p>Talk about criteria for grouping, sorting and classifying;</p> <p>Use simple keys;</p> <p>Begin to look for naturally occurring patterns and relationships and decide what data to collect to identify them;</p> <p>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;</p> <p>Collect data from their own observations and measurements, using notes, simple tables and standard units, and help to make decisions about how to record and analyse this data;</p> <p>Use relevant scientific language to discuss their ideas and communicate their findings in ways that are appropriate for different audiences.</p>	<p>N.C: Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate</p> <p>N.C: Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs</p> <p>Choose the most appropriate equipment to make measurements and explain how to use it accurately;</p> <p>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.</p>
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<p>Concluding</p>	<p>Talks about why things happen and how things work.</p> <p>Uses talk to connect ideas, explain what is happening and anticipate what might happen next, recall and relive past experiences.</p>	<p>Uses talk to organise, sequence and clarify thinking, ideas, feelings and events</p> <p>Looks closely at similarities, differences, patterns and change.</p>	<p>N.C: Using their observations and ideas to suggest answers to questions</p> <p>With help, begin to use simple scientific language when communicating their findings.</p>	<p>N.C: Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.</p> <p>N.C: Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.</p> <p>N.C: Identifying differences, similarities or changes related to simple scientific ideas and processes.</p> <p>N.C: Using straightforward scientific evidence to answer questions or to support their findings.</p> <p>With help, look for changes, patterns, similarities and differences in data in order to draw simple conclusions and answer questions.</p>	<p>N.C: Identifying scientific evidence that has been used to support or refute ideas or arguments.</p> <p>N.C: Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations</p> <p>Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas ;</p> <p>Use scientific language to describe how scientific ideas have developed over time.</p>
<p>Evaluating</p>				<p>N.C: Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.</p> <p>Recognise when and how secondary sources might help to answer questions that cannot be answered through practical investigations.</p>	<p>N.C: Using test results to make predictions to set up further comparative and fair tests</p>

Relevant Early Learning Goals:

- Children follow instructions involving several ideas or actions. They answer ‘how’ and ‘why’ questions about their experiences and in response to stories or events.
- Children use everyday language to talk about size, weight, capacity, position, distance, time and money to compare quantities and objects and to solve problems. They recognise, create and describe patterns. They explore characteristics of everyday objects and shapes and use mathematical language to describe them.
- Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur, and talk about changes.
- Children recognise that a range of technology is used in places such as homes and schools. They select and use technology for particular purposes

Part 2: Scientific Knowledge and Understanding

Curriculum Area	EYFS		KS1	LKS2	UKS2
	Nursery & Reception		Year 1 & Year 2	Year 3 & Year 4	Year 5 & Year 6
	30-50 months	40-60 months	Green = Year A, Purple = Year B	Green = Year A, Purple = Year B	Green = Year A, Purple = Year B
Animals including humans	<p>Can tell adults when hungry or tired or when they want to rest or play.</p> <p>Observes the effects of activity on their bodies.</p>	<p>Eats a healthy range of foodstuffs and understands need for variety in food.</p> <p>Shows some understanding that good practices with regard to exercise, eating, sleeping and hygiene can contribute to good health.</p> <p>Early Learning Goal: Children know the importance for good health of physical exercise, and a healthy diet, and talk about ways to keep healthy and safe. They manage their own basic hygiene and personal needs successfully, including dressing and going to the toilet independently.</p>	<p>Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals</p> <p>Identify and name a variety of common animals that are carnivores, herbivores and omnivores</p> <p>Describe and compare the structure of common animals (fish, amphibians, reptiles, birds and mammals including pets)</p> <p>Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with which sense</p> <p>Notice that animals, including humans, have offspring which grow into adults</p> <p>Find out about and describe the basic needs of animals, including humans, for survival (water, food and air)</p> <p>Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene</p>	<p>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</p> <p>Identify that humans and some other animals have skeletons and muscles for support, protection and movement</p> <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>	<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> <p>Describe the changes as humans develop to old age (also repeated in year B.)</p> <p>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</p> <p>Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents</p> <p>Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.</p>

	EYFS		KS1	LKS2	UKS2
	Nursery & Reception		Year 1 & Year 2	Year 3 & Year 4	Year 5 & Year 6
	30-50 months	40-60 months	Green = Year A, Purple = Year B	Green = Year A, Purple = Year B	Green = Year A, Purple = Year B
Living things and their habitats	<p>Comments and asks questions about aspects of their familiar world such as the place where they live or the natural world.</p> <p>Can talk about some of the things they have observed such as plants, animals, natural and found objects.</p> <p>Developing an understanding of growth, decay and changes over time.</p> <p>Shows care and concern for living things and the environment.</p>	<p>Looks closely at similarities, differences, patterns and change.</p> <p>Early Learning Goal: Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur, and talk about changes.</p>	<p>Explore and compare the differences between things that are living, dead, and things that have never been alive</p> <p>Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and different sources of food</p> <p>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</p> <p>Identify and name a variety of plants and animals in their habitats, including micro-habitats.</p>	<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>	<p>Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird (also repeated in year B)</p> <p>Describe the life process of reproduction in some plants and animals (also repeated in year B)</p> <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>

	EYFS		KS1	LKS2	UKS2
	Nursery & Reception		Year 1 & Year 2	Year 3 & Year 4	Year 5 & Year 6
	30-50 months	40-60 months	Green = Year A, Purple = Year B	Green = Year A, Purple = Year B	Green = Year A, Purple = Year B
Plants	<p>Comments and asks questions about aspects of their familiar world such as the place where they live or the natural world.</p> <p>Can talk about some of the things they have observed such as plants, animals, natural and found objects.</p> <p>Developing an understanding of growth, decay and changes over time.</p> <p>Shows care and concern for living things and the environment.</p>	<p>Looks closely at similarities, differences, patterns and change.</p> <p>Early Learning Goal: Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur, and talk about changes.</p>	<p>Identify & name variety of common plants, including deciduous and evergreen trees</p> <p>Identify & describe basic structure of common flowering plants including trees</p> <p>Observe & describe how seeds & bulbs grow into mature plants</p> <p>Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.</p>	<p>Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers</p> <p>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</p> <p>Investigate the way in which water is transported within plants</p> <p>Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.</p>	
	EYFS		KS1	LKS2	UKS2
	Nursery & Reception		Year 1 & Year 2	Year 3 & Year 4	Year 5 & Year 6
	30-50 months	40-60 months	Green = Year A, Purple = Year B	Green = Year A, Purple = Year B	Green = Year A, Purple = Year B
Seasonal Changes	As above (living things and their habitats & plants.)	As above (living things and their habitats & plants.)	<p>Observe changes across the four seasons</p> <p>Observe and describe weather associated with the seasons and how day length varies.</p>		

	EYFS		KS1	LKS2	UKS2
	Nursery & Reception		Year 1 & Year 2	Year 3 & Year 4	Year 5 & Year 6
	30-50 months	40-60 months	Green = Year A, Purple = Year B	Green = Year A, Purple = Year B	Green = Year A, Purple = Year B
Everyday Materials: KS1 States of Matter: LKS2 Properties and Changes of Materials: UKS2	<p>Beginning to be interested in and describe the texture of things.</p>		<p>Distinguish between an object and the material from which it is made</p> <p>Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water and rock</p> <p>Describe the simple physical properties of a variety of everyday materials</p> <p>Compare and group together a variety of everyday materials on the basis of their simple physical properties</p> <p>Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses</p> <p>Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.</p>	<p>Compare and group materials together, according to whether they are solids, liquids or gases</p> <p>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)</p> <p>Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</p>	<p>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</p> <p>Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution</p> <p>Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating</p> <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>

	EYFS		KS1	LKS2	UKS2
	Nursery & Reception		Year 1 & Year 2	Year 3 & Year 4	Year 5 & Year 6
	30-50 months	40-60 months	Green = Year A, Purple = Year B	Green = Year A, Purple = Year B	Green = Year A, Purple = Year B
Rocks				<p>Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties</p> <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>	
	EYFS		KS1	LKS2	UKS2
	Nursery & Reception		Year 1 & Year 2	Year 3 & Year 4	Year 5 & Year 6
	30-50 months	40-60 months	Green = Year A, Purple = Year B	Green = Year A, Purple = Year B	Green = Year A, Purple = Year B
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>	<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>

	EYFS		KS1	LKS2	UKS2
	Nursery & Reception		Year 1 & Year 2	Year 3 & Year 4	Year 5 & Year 6
	30-50 months	40-60 months	Green = Year A, Purple = Year B	Green = Year A, Purple = Year B	Green = Year A, Purple = Year B
Electricity				<p>Identify common appliances that run on electricity</p> <p>Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers</p> <p>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</p> <p>Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit</p> <p>Recognise some common conductors and insulators, and associate metals with being good conductors.</p>	<p>Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit</p> <p>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</p> <p>Use recognised symbols when representing a simple circuit in a diagram.</p>

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	Nursery & Reception		Year 1 & Year 2	Year 3 & Year 4	Year 5 & Year 6
	30-50 months	40-60 months	Green = Year A, Purple = Year B	Green = Year A, Purple = Year B	Green = Year A, Purple = Year B
Sound	Explores and learns how sounds can be changed			<p>Identify how sounds are made, associating some of them with something vibrating</p> <p>Recognise that vibrations from sounds travel through a medium to the ear</p> <p>Find patterns between the pitch of a sound and features of the object that produced it</p> <p>Find patterns between the volume of a sound and the strength of the vibrations that produced it</p> <p>Recognise that sounds get fainter as the distance from the sound source increases.</p>	
	EYFS		KS1	LKS2	UKS2
	Nursery & Reception		Year 1 & Year 2	Year 3 & Year 4	Year 5 & Year 6
	30-50 months	40-60 months	Green = Year A, Purple = Year B	Green = Year A, Purple = Year B	Green = Year A, Purple = Year B
Light			<p>Recognise that we 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 of shadows change.</p>	<p>Recognise that light appears to travel in straight lines</p> <p>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</p> <p>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</p> <p>Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.</p>	

	EYFS		KS1	LKS2	UKS2
	Nursery & Reception		Year 1 & Year 2	Year 3 & Year 4	Year 5 & Year 6
	Year A	Year B	Green = Year A, Purple = Year B	Green = Year A, Purple = Year B	Green = Year A, Purple = Year B
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>