

Science

Edmund Waller
Curriculum

Intent

Implementation

Impact



Know, Explore, Communicate

Intent

At Edmund Waller Primary School, our aim is to give all children a strong understanding of the world in which they live while enabling them to acquire specific skills and knowledge to help them to think and work scientifically.

Our curriculum gives children an understanding of scientific processes and provides the foundations for understanding the world through the specific disciplines of Biology, Chemistry and Physics. Children are taught to think about the uses and implications of science, both for today and in the future.

We follow the objectives of the National Curriculum and use the Kent Science scheme to ensure that science is taught with precision and rigour while ensuring coherent progress across the year groups; knowledge is built upon throughout the school, where teachers base new learning on top of the foundations of prior learning.

In addition we use Chris Quigley's Greater Depth in science to challenge and further develop the thinking for the high attaining learners.

Science is taught in discrete lessons on a weekly basis and cross-curricular links are made explicit to help children understand that science encompasses every aspect of our daily lives.

Opportunities to enhance the teaching of mathematical skills are identified in each unit of learning. We also continually encourage children to read science texts for pleasure. Our curriculum is planned to be inclusive therefore lessons are planned to be accessible to all. All children will be provided with a broad and balanced science curriculum which reflects the equality and diversity policies and practice in school.

We ensure that the skills required to work and think scientifically are developed progressively throughout children's time at the school; they can apply their knowledge of science when using equipment, conducting experiments, building arguments and explaining concepts. Key scientific terminology is explicitly taught and children are encouraged to use this vocabulary to explain their thoughts clearly both orally and in written work.

We want children to continually ask questions and be curious about their surroundings. Visitors and offsite educational visits enhance the delivery of our science curriculum while we use the different environments within our school grounds to anchor learning within familiar and everyday contexts.

Implementation

Throughout the teaching of Science, we aim to enable pupils to develop a keen interest in science and develop a sense of excitement and curiosity about the world around them. Children are encouraged to ask questions and be curious about their surroundings. A love of science is nurtured through a varied and exciting science curriculum that provides children with quality first hand experiences when relevant. Throughout the programmes of study, the children acquire and develop both substantive and disciplinary knowledge that is taught together rigorously. The knowledge identified by each year group is informed by the national curriculum and is built on progressively throughout. Teachers are careful to address misconceptions when they arise. Key skills are mapped for each year group which are in accordance with the Working Scientifically skills expectations of the national curriculum. The curriculum is designed to ensure that children are able to acquire key scientific knowledge through practical experiences and to develop the skills required to allow them to use equipment confidently, build on prior knowledge, conduct experiments with aptitude, explain scientific concepts confidently, and draw conclusions to deepen their understanding. We add knowledge to things that are already learnt, revisiting prior learning without repeating it,

Through strong subject knowledge and a coherently sequenced curriculum teachers create a positive attitude to science learning. Teachers reinforce an expectation that all pupils are life-long learners capable of achieving high standards in science. Children are introduced to each science unit with knowledge organisers that focus on identifying prior knowledge, key learning, concepts, vocabulary and past pioneers in their fields such as Linda Brown Buck- biologist, Rachel Carson- Oceanologist, and Joseph Banks- Naturalist and Botanist.

Implementation continued

Teachers use precise questioning in class to assess substantive and disciplinary knowledge.

We use low stakes retrieval quizzes to revisit prior knowledge. We understand that enables children to move learning to the long-term memory. We are careful to not overload the working memory.

Furthermore, teachers use an end of unit summative assessment to identify any gaps in knowledge, to check understanding of concepts and to identify high attaining learners who will be working at greater depth.

Tasks are selected and designed to provide appropriate challenge to all learners, in line with the school's commitment to inclusion. Working Scientifically skills are embedded into lessons to ensure that disciplinary knowledge and skills are systematically developed throughout the children's primary education and new vocabulary and challenging concepts are introduced through direct teaching.

We use a Scientific Inquiry approach: involving teacher explanations alongside a range of questioning and carefully planned activities. We know that explanations are vital to ensure understanding and that it is sometimes beneficial for pupils to know the outcome of an experiment before they participate in it, so that they are able to observe from a place of knowledge.

Plans are adapted to ensure that learning is suitable for every learner. The children's voice is used to further develop the science curriculum, through questioning of children's views and attitudes to science to support the children's enjoyment of science and to motivate learners.

We build on the lines of enquiry and interests that children develop during their time in the the EYFS, where children are introduced to the natural world and scientific concepts through play and experiences accompanied by quality first teaching.

Implementation – Science Long term plan

Year Group	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 1	Seasonal change		Everyday materials		Plants	Animals including humans
Year 2	All living things in their habitats		Use of everyday materials		Animals including humans	Plants
Year 3	Forces and magnets		Light	Rocks	Animals including humans	Plants
Year 4	Sound		States of matter	electricity	Animals including humans	All living things
Year 5	Animals including humans	Earth and space	Forces	forces	Properties and changes in materials	All living things
Year 6	All living things	Evolution and inheritance	electricity	light	Animals including humans	

Planning and Progression in working scientifically

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
1. Ideas and evidence in science	<ul style="list-style-type: none"> to collect evidence to try to answer a question 	<ul style="list-style-type: none"> to collect evidence to answer a question 	<ul style="list-style-type: none"> to collect evidence in a variety of contexts to answer a question or test an idea 	<ul style="list-style-type: none"> to collect evidence in a variety of contexts to test an idea or prediction based on their scientific knowledge and understanding 	<ul style="list-style-type: none"> to consider how scientists have combined evidence from observation and measurement with creative thinking to suggest new ideas and explanations for phenomena 	<ul style="list-style-type: none"> to consider how scientists have combined evidence from observation and measurement with creative thinking to suggest new ideas and explanations for phenomena
2. Investigative skills - Planning	<ul style="list-style-type: none"> to test ideas suggested to them and say what they think will happen 	<ul style="list-style-type: none"> to suggest some ideas and questions based on simple knowledge and say how they might find out about them; to say what they think might happen to think about and discuss whether comparisons and tests are fair or unfair 	<ul style="list-style-type: none"> in a variety of contexts, to suggest questions and ideas and how to test them; to make predictions about what will happen; to think about how to collect sufficient evidence in some contexts; to consider what makes a test unfair or evidence sufficient and, with help, plan fair tests 	<ul style="list-style-type: none"> to suggest questions that can be tested and make predictions about what will happen, some of which are based on scientific knowledge; to design a fair test or plan how to collect sufficient evidence; in some contexts, to choose what apparatus to use and what to measure 	<ul style="list-style-type: none"> to make predictions of what will happen based on scientific knowledge and understanding, and suggest how to test these; to use knowledge and understanding to plan how to carry out a fair test or how to collect sufficient evidence to test an idea; to identify factors that need to be taken into consideration in different contexts 	<ul style="list-style-type: none"> to decide how to turn ideas into a form that can be tested and, where appropriate, to make predictions using scientific knowledge and understanding; to identify factors that are relevant to a particular situation; to choose what evidence to collect to investigate a question, ensuring the evidence is sufficient; to choose what equipment to use

Planning and Progression in working scientifically

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
- Obtaining and presenting evidence	<ul style="list-style-type: none"> • to make observations using appropriate senses; • to make some measurements of length using standard and non-standard measures; • to present some findings in simple tables and block graphs 	<ul style="list-style-type: none"> • to make observations; to make measurements of length in standard and non- standard measures; • to make records of observations; and to present results in tables, drawings and block graphs 	<ul style="list-style-type: none"> • to make observations and comparisons; • to measure length, volume of liquid and time in standard measures using simple measuring equipment effectively • to present results in drawings, bar charts and tables 	<ul style="list-style-type: none"> • to make observations and comparisons of relevant features in a variety of contexts; • to make measurements of temperature, time and force as well as measurements of length; • to begin to think about why measurements of length should be repeated • to present results in bar charts and tables 	<ul style="list-style-type: none"> • to make relevant observations; • to consolidate measurement of volume, temperature, time and length; • to measure pulse rate; • to think about why observations and measurements should be repeated; • to present results in bar charts and line graphs 	<ul style="list-style-type: none"> • to make a variety of relevant observations and measurements using simple apparatus correctly; to decide when observations and measurements need to be checked, by repeating, to give more reliable data; • to use tables, bar charts and line graphs to present results
Considering evidence and evaluating	<ul style="list-style-type: none"> • to make simple comparisons and groupings that relate to differences and similarities between living things and objects; • in some cases to say what their observations show, and whether it was what they expected; • to draw simple conclusions and explain what they did 	<ul style="list-style-type: none"> • to make simple comparisons, identifying similarities and differences between living things, objects and events; • to say what results show; • to say whether their predictions were supported; • in some cases to use knowledge to explain what was found out and to draw conclusions; • to explain what they did 	<ul style="list-style-type: none"> • to draw conclusions from results and begin to use scientific knowledge to suggest explanations for them; • to make generalisations and begin to identify simple patterns in results presented in tables 	<ul style="list-style-type: none"> • to identify simple trends and patterns in results presented in tables, charts and graphs and to suggest explanations for some of these; • to explain what the evidence shows and whether it supports any prediction made; • to link the evidence to scientific knowledge and understanding in some contexts 	<ul style="list-style-type: none"> • to decide whether results support any prediction; • to begin to evaluate repeated results; • to recognise and make predictions from patterns in data and suggest explanations for these using scientific knowledge and understanding; • to interpret data and think about whether it is sufficient to draw conclusions; • to draw conclusions indicating whether these match any prediction made 	<ul style="list-style-type: none"> • to make comparisons; to evaluate repeated results; • to identify patterns in results and results that do not appear to fit the pattern; • to use results to draw conclusions and to make further predictions; • to suggest and evaluate explanations for these predictions using scientific knowledge and understanding; • to say whether the evidence supports any prediction made

Progression by year group	Plants
EYFS 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.
Year 1	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.
Year 2	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. Identify and name a variety of plants and animals in their habitats, including microhabitats. (Y2 - Living things and their habitats)
Year 3	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.
Year 4	Recognise that living things can be grouped in a variety of ways. (Y4 - Living things and their habitats) Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. (Y4 - Living things and their habitats) Recognise that environments can change and that this can sometimes pose dangers to living things. (Y4 - Living things and their habitats)
Year 5	Describe the life process of reproduction in some plants and animals. (Y5 - Living things and their habitats)
Year 6	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. (Y6 - Living things and their habitats) • Give reasons for classifying plants and animals based on specific characteristics. (Y6 - Living things and their habitats)

Progression by year group	Living things and their habitats
EYFS 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.
Year 1	<p>Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. (Y1 - Plants)</p> <p>Identify and describe the basic structure of a variety of common flowering plants, including trees. (Y1 - Plants)</p> <p>Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. (Y1 - Animals including humans)</p> <p>Identify and name a variety of common animals that are carnivores, herbivores and omnivores. (Y1 - Animals including humans)</p> <p>Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets). (Y1 – Animals, including humans)</p> <p>Observe the changes to living things across the four seasons. (Y1 - Seasonal change)</p>
Year 2	<p>Explore and compare the differences between things that are living, dead, and things that have never been alive.</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 microhabitats.</p> <p>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.</p> <p>Notice that animals, including humans, have offspring which grow into adults. (Y2 - Animals including humans)</p>
Year 3	Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. (Y3 - Plants)
Year 4	<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>Construct and interpret a variety of food chains, identifying producers, predators and prey. (Y4 - Animals, including humans)</p>
Year 5	<p>Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.</p> <p>Describe the life process of reproduction in some plants and animals.</p>
Year 6	<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>

Progression by year group	Animals including Humans
EYFS early learning goal	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.
Year 1	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.
Year 2	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.
Year 3	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.
Year 4	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.
Year 5	Describe the changes as humans develop to old age. Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. (Y5 - Living things and their habitats) Describe the life process of reproduction in some plants and animals. (Y5 - Living things and their habitats)
Year 6	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. 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. (Y6 - Living things and their habitats) Give reasons for classifying plants and animals based on specific characteristics. (Y6 - Living things and their habitats)

Progression by year group	Evolution and inheritance
EYFS 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.
Year 1	
Year 2	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. (Y2 - Living things and their habitats)
Year 3	Describe in simple terms how fossils are formed when things that have lived are trapped within rock. (Y3 - Rocks)
Year 4	Recognise that environments can change and that this can sometimes pose dangers to living things. (Y4 - Living things and their habitats)
Year 5	
Year 6	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.

Progression by Year group	Seasonal changes
EYFS 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.
Year 1	Observe changes across the four seasons. Observe and describe weather associated with the seasons and how day length varies.
Year 2	
Year 3	Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. (Y3 - Light)
Year 4	
Year 5	Use the idea of the Earth's rotation to explain day and night and the apparent movement of the Sun across the sky. (Y5 - Earth and space)
Year 6	

Progression by year group	Materials
EYFS 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.
Year 1	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
Year 2	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.
Year 3	Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. (Y3 - Rocks) Describe in simple terms how fossils are formed when things that have lived are trapped within rock. (Y3 - Rocks) Notice that some forces need contact between two objects, but magnetic forces can act at a distance. (Y3 - Forces and magnets)
Year 4	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
Year 5	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 the action of acid on bicarbonate of soda.
Year 6	

Progression by year group	Rocks
EYFS 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.
Year 1	<p>Distinguish between an object and the material from which it is made. (Y1 - Everyday materials)</p> <p>Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. (Y1 - Everyday materials)</p> <p>Describe the simple physical properties of a variety of everyday materials. (Y1 - Everyday materials)</p> <p>Compare and group together a variety of everyday materials on the basis of their simple physical properties. (Y1 - Everyday materials)</p>
Year 2	Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. (Y2 - Uses of everyday materials)
Year 3	<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>
Year 4	
Year 5	
Year 6	Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. (Y6 - Evolution and inheritance)

Progression by year group	Light
EYFS 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.
Year 1	Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. (Y1 - Animals, including humans)
Year 2	
Year 3	<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 of shadows change.</p>
Year 4	
Year 5	
Year 6	<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 eye</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>

Progression by year group	Forces
EYFS 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.
Year 1	
Year 2	Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. (Y2 - Uses of everyday materials)
Year 3	<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>
Year 4	
Year 5	<p>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.</p> <p>Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.</p>
Year 6	

Progression by year group	Sound
EYFS 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 environment
Year 1	Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. (Y1 - Animals, including humans)
Year 2	
Year 3	
Year 4	<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>
Year 5	
Year 6	

Progression by year group	Electricity
EYFS 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.
Year 1	
Year 2	
Year 3	
Year 4	<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>
Year 5	
Year 6	<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>

Progression by year group	Earth and space
EYFS 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.
Year 1	Observe changes across the four seasons. (Y1 - Seasonal changes) Observe and describe weather associated with the seasons and how day length varies. (Y1 - Seasonal changes)
Year 2	
Year 3	
Year 4	
Year 5	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.
Year 6	

Impact

- The successful approach to the teaching of science will result in an interesting, engaging, high quality science education that provides children with the foundations for understanding the world that they can take with them onwards in their education.
- Our aim is to ensure that by the time children move on to the next stage in their education they are equipped with the skills to be scientifically literate both within education and within society. That is, all children are educated to a standard where they can understand and debate issues that affect their lives and that they have a secure understanding of the scientific concepts that have a bearing on the way that they can live their lives
- By the end of Key Stage Two, all children will have developed scientific enquiry skills in the five key areas: Observing changes over time, noticing patterns, grouping and classifying things, finding things out through secondary sources of information and modelling.
- We aim for children to be immersed in science to reinforce the skills that they have previously learned, but then want to build on them by challenging their thinking further. Through enrichment opportunities such as workshops, trips and extracurricular activities, children develop the understanding that science has changed our lives and that it is vital to the world's future prosperity

Outcomes

Plants Living things and their habitats (UKS2)	At the end of KS1 children can	At the end of lower KS2 children can	At the end of upper KS2 children can
	identify and name a variety of common wild and garden plants, including deciduous and evergreen trees	identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers	describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird
	identify and describe the basic structure of a variety of common flowering plants, including trees	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	describe the life process of reproduction in some plants and animals
	observe and describe how seeds and bulbs grow into mature plants	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	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
	find out and describe how plants need water, light and a suitable temperature to grow and stay healthy	explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal	give reasons for classifying plants and animals based on specific characteristics

Outcomes

Animals including Humans	At the end of KS1 children can	At the end of lower KS2 children can	At the end of upper KS2 children can
	explore and compare the differences between things that are living, dead, and things that have never been alive	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	describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird
	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 that humans and some other animals have skeletons and muscles for support, protection and movement	describe the life process of reproduction in some plants and animals
	identify and name a variety of plants and animals in their habitats, including microhabitats	describe the simple functions of the basic parts of the digestive system in humans	
	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	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	

Outcomes

Everyday materials	At the end of KS1 children can	At the end of upper KS2 children can
	distinguish between an object and the material from which it is made	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
	identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock	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
	describe the simple physical properties of a variety of everyday materials	decide how mixtures might be separated, including through filtering, sieving and evaporating
	compare and group together a variety of everyday materials on the basis of their simple physical properties	give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic
	identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses	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 the action of acid on bicarbonate of soda
	find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching	

Outcomes

Seasonal changes	At the end of KS1 children can
	observe changes across the 4 seasons
	observe and describe weather associated with the seasons and how day length varies

Rocks	At the end of LKS2 children can
	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

Outcomes

Light	At the end of LKS2 children can	At the end of UKS2 children can
	notice that light is reflected from surfaces	recognise that light appears to travel in straight lines
	recognise that they need light in order to see things and that dark is the absence of light	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
	recognise that light from the sun can be dangerous and that there are ways to protect their eyes	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
	recognise that shadows are formed when the light from a light source is blocked by an opaque object	use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them
	find patterns in the way that the size of shadows change	

Outcomes

Forces and magnets	At the end of LSK2 children can	At the end of UKS2 children can
	compare how things move on different surfaces	explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object
	notice that some forces need contact between 2 objects, but magnetic forces can act at a distance	identify the effects of air resistance, water resistance and friction, that act between moving surfaces
	observe how magnets attract or repel each other and attract some materials and not others	recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect
	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	

Outcomes

Sound	At the end of LKS2 children can
	identify how sounds are made, associating some of them with something vibrating
	recognise that vibrations from sounds travel through a medium to the ear
	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

Outcomes

Electricity	At the end of LKS2 children can	At the end of UKS2 children can
	identify common appliances that run on electricity	associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit
	construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers	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
	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	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
	recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series 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
	recognise some common conductors and insulators, and associate metals with being good conductors	

Outcomes

Earth and space	At the end of UKS2 children can
	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

Evolution and inheritance	At the end of UKS2 children can
	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