Science

Intent

At Layfield Primary School, we recognise the importance of science in every aspect of daily life. As one of the core subjects taught in primary schools, we give the teaching and learning of science the prominence it requires.

Our science curriculum is designed to provide a coherent and progressive development of knowledge, skills and understanding.

We want our pupils to:

Love learning about our world and the importance of science within in.

Achieve their full potential by increasing their knowledge and understanding of our world.

Develop curiosity by exploring their ideas and recording their investigations.

Have fun investigating and developing skills.

Be inspired by famous scientists and their inventions and how these developments affect living organisms and the physical environment.

Have memorable experiences through the process of enquiry with the opportunity to evaluate evidence.

Learn life skills by understanding the part science plays in every aspect of daily life, encouraging respect for living organisms and the physical environment.

Develop as individuals by providing challenge, support and inspiration.

Implementation

Our science curriculum provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Science has changed our lives and is vital to the world's future prosperity, and our pupils are taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational knowledge and concepts, our pupils are encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena.

Lessons are delivered in themes, for example 'Plants', 'Animals, including Humans', 'Electricity', etc. and the overarching element of 'Working Scientifically' is taught as ongoing. While it is important that pupils make progress, it is also vitally important that they develop secure understanding of each key block of knowledge and concepts in order to progress to the next stage. Insecure, superficial understanding will not allow genuine progression: pupils may struggle at key points of transition (such as between primary and secondary school), build up serious misconceptions, and/or have significant difficulties in understanding higher-order content. In order to ensure that learning is secure, opportunities to revisit past learning are a part of each science lesson.

Lessons are well sequenced to provide a coherent curriculum that develops children's knowledge, skills and subject disciplines. Opportunities for making meaningful connections with other subject areas, such as maths or design technology, are identified and planned accordingly. We strive to make lessons engaging, practical and active, finding opportunities for visits, visitors and theme days, including Science Week.

Early Learning Goals	National Curriculum	
EY	**KS1**	**KS2**
The Natural World Children at the expected level of development will: • Explore the natural world around them, making observations and drawing pictures of animals and plants; • Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class; • Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.	**Working scientifically** Pupils should be taught to: • ask simple questions and recognise that they can be answered in different ways • observe closely, using simple equipment • perform simple tests • identify and classify • use their observations and ideas to suggest answers to questions • gather and record data to help in answering questions. **Year 1** **Plants** Pupils should be taught to: • 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.	**Lower Key Stage 2** **Working scientifically** Pupils should be taught to: • ask relevant questions and use different types of scientific enquiries to answer them • set up simple practical enquiries, comparative and fair tests • make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers • gather, record, classify and present 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 • report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions

	Animals, including humans Pupils should be taught to: • identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals • identify and name a variety of common animals that are carnivores, herbivores and omnivores • describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets) • identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. **Everyday materials** Pupils should be taught to: • 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. **Seasonal changes** Pupils should be taught to: • observe changes across the four seasons • observe and describe weather associated with the seasons and how day length varies. **<u>Year 2</u>** **Living things and their habitats** Pupils should be taught to: • 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 micro-habitats • 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. **Plants** Pupils should be taught to: • 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.	• use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions • identify differences, similarities or changes related to simple scientific ideas and processes • use straightforward scientific evidence to answer questions or to support their findings. **<u>Year 3</u>** **Plants** Pupils should be taught to: • identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers • explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant • investigate the way in which water is transported within plants • explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. **Animals, including humans** Pupils should be taught to: • identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat • identify that humans and some other animals have skeletons and muscles for support, protection and movement. **Rocks** Pupils should be taught to: • 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. **Light** Pupils should be taught to: • 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 • 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.

	Animals, including humans Pupils should be taught to: • 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. **Uses of everyday materials** Pupils should be taught to: • 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.	**Forces and Magnets** Pupils should be taught to: • compare how things move on different surfaces • notice that some forces need contact between two 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 two poles • predict whether two magnets will attract or repel each other, depending on which poles are facing. **<u>Year 4</u>** **Living things and their habitats** Pupils should be taught to: • 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. **Animals, including humans** Pupils should be taught to: • 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. **States of matter** Pupils should be taught to: • compare and group materials together, according to whether they are solids, liquids or gases • observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C) • identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. **Sound** Pupils should be taught to: • 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. **Electricity** Pupils should be taught to: • 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. **<u>Upper Key Stage 2</u>** **Working Scientifically** Pupils should be taught to: • plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary • take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate • record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs • use test results to make predictions to set up further comparative and fair tests • report and present 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 • identify scientific evidence that has been used to support or refute ideas or arguments. **<u>Year 5</u>** **Living things and their habitats** Pupils should be taught to:

		• describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird • describe the life process of reproduction in some plants and animals. **Animals, including humans** Pupils should be taught to: • describe the changes as humans develop to old age. **Properties and changes of materials** Pupils should be taught to: • 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. **Earth and space** Pupils should be taught to: • 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. **Forces** Pupils should be taught to: • 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. **Year 6**

		Living things and their habitats Pupils should be taught to: • 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 • give reasons for classifying plants and animals based on specific characteristics. **Animals, including humans** Pupils should be taught to: • 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. **Evolution and inheritance** Pupils should be taught to: • recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago • recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents • identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution. **Light** Pupils should be taught to: • recognise that light appears to travel in straight lines • use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye • explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes • use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. **Electricity** Pupils should be taught to: • 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.

EYFS

Scientific knowledge and skills fall under the 'Understanding the World – The World' area of learning with a specific Early Learning Goal entitled 'The Natural World'.

Topics are supported by quality experiences delivered through focus days, visits, visitors and by external providers. These are chosen carefully to enable children to experience and develop a range of skills underpinning science education. Planning is flexible and responsive to children's needs and can be changed and adapted dependent on children's interests. Science activities in the Early Years are taught through play, investigation and enquiry. They support the development of language.

Early Years are in a unique and wonderful position to follow the children's interests and fascinations which encourages children to develop the and really embed learning in a way that is fun and memorable.

Term	Nursery	Reception
Autumn 1	To be able to talk about their body parts and what the function is of each part.	To talk about the changes they observe in their environment - Seasons link.
Autumn 2	To draw silhouettes and orally label body parts. To be able to identify similarities and differences between themselves and peers.	To talk about the changes they observe in their environment - Seasons link To identify and sort healthy/unhealthy foods
Spring 1		To make observations and express their views of the environment
Spring 2	To talk about the life cycle of animals	To talk about the life cycle of animals and what they need to survive. To make observations and express their views of the environment, discussing how they may vary from one another
Summer 1	To make comparisons between habitats of mini beasts and farm animals. To make own habitats using a range of resources.	To sort information using Venn Diagrams. To talk about the life cycle of animals and what they need to survive. To explore a range of habitats, looking at why the animal lives like that.
Summer 2	To explore materials which will float and which will sink.	To ask questions about their familiar world (where they live or the natural world).

Key Stage One

Pupils experience and observe phenomena, looking more closely at the natural and humanly-constructed world around them. They are encouraged to be curious and ask questions about what they notice. They develop their understanding of scientific ideas by using different types of scientific enquiry to answer their own questions, including observing changes over a period of time, noticing patterns, grouping and classifying things, carrying out simple comparative tests, and finding things out using secondary sources of information. They begin to use simple scientific language to talk about what they have found out and communicate their ideas to a range of audiences in a variety of ways. Most of the learning about science is done through the use of first-hand practical experiences, but there is also some use of appropriate secondary sources, such as books, photographs and videos.

'Working scientifically' is taught through and clearly related to the teaching of substantive science content in each programme of study.

Pupils read and spell scientific vocabulary at a level consistent with their increasing word reading and spelling knowledge at key stage 1.

Key Stage Two

Pupils broaden their scientific view of the world around them. They do this through exploring, talking about, testing and developing ideas about everyday phenomena and the relationships between living things and familiar environments, and by beginning to develop their ideas about functions, relationships and interactions. They ask their own questions about what they observe and make some decisions about which types of scientific enquiry are likely to be the best ways of answering them, including observing changes over time, noticing patterns, grouping and classifying things, carrying out simple comparative and fair tests and finding things out using secondary sources of information. They draw simple conclusions and use some scientific language, first, to talk about and, later, to write about what they have found out.

'Working scientifically' is taught through and clearly related to substantive science content in each programme of study.

Pupils read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge.

Key Stage 1 and 2 long term plan

Year 1	Plants	Everyday materials	Plants	Animals including humans	Seasonal changes

Year 2	Animals including humans	Uses of everyday Materials	Plant	Living things and their habitats	Uses of everyday Materials
Year 3	Light	Animals including humans	Forces and magnets	Rocks	Plants
Year 4	States of matter	Electricity	Living things and their habitats	Animals including humans	Sound
Year 5	Forces	Earth and space	Living things and their habitats	Animals including humans	Properties and changes of materials
Year 6	Animals including humans	Living things and their habitats	Electricity	Evolution and inheritance	Light

Early Years Foundation Stage

The curriculum is taught through topics which ensure continuous provision and the skills progression as outlined in 'Birth to 5 Matters':

Understanding the world – The World	
Range 3	• Is curious and interested to explore new and familiar experiences in nature: grass, mud, puddles, plants, animal life • Explores objects by linking together different approaches: shaking, hitting, looking, feeling, tasting, mouthing, pulling, turning and poking • Remembers where objects belong • Matches parts of objects that fit together, e.g. puts lid on teapot
Range 4	• Notices detailed features of objects in their environment • Can talk about some of the things they have observed such as plants, animals, natural and found objects • Enjoys playing with small world reconstructions, building on first-hand experiences, e.g. visiting farms, garages, train tracks, walking by river or lake
Range 5	• Comments and asks questions about aspects of their familiar world such as the place where they live or the natural world • Talks about why things happen and how things work • Developing an understanding of growth, decay and changes over time • Shows care and concern for living things and the environment • Begin to understand the effect their behaviour can have on the environment
Range 6	• Looks closely at similarities, differences, patterns and change in nature • Knows about similarities and differences in relation to places, objects, materials and living things • Talks about the features of their own immediate environment and how environments might vary from one another

	• Makes observations of animals and plants and explains why some things occur, and talks about changes
ELG	**The Natural World** Children at the expected level of development will: • Explore the natural world around them, making observations and drawing pictures of animals and plants; • Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class; • Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.

Reception, Key Stage 1 & 2

Working Scientifically	
Asking questions and recognising that they can be answered in different ways	
EYFS	**Comments and asks questions about aspects of their familiar world such as the place where they live or the natural world (Range 5)**
	- While exploring the world, the children develop their ability to ask questions. Where appropriate, they answer these questions.
Year 1 & 2	**Asking simple questions and recognising that they can be answered in different ways**
	- While exploring the world, the children develop their ability to ask questions (such as what something is, how things are similar and different, the ways things work, which alternative is better, how things change and how they happen). Where appropriate, they answer these questions. - The children answer questions developed with the teacher often through a scenario. - The children are involved in planning how to use resources provided to answer the questions using different types of enquiry, helping them to recognise that there are different ways in which questions can be answered.
Year 3 & 4	**Asking relevant questions and using different types of scientific enquiries to answer them**
	- The children consider their prior knowledge when asking questions. They independently use a range of question stems. Where appropriate, they answer these questions. - The children answer questions posed by the teacher. - Given a range of resources, the children decide for themselves how to gather evidence to answer the question. They recognise when secondary sources can be used to answer questions that cannot be answered through practical work. They identify the type of enquiry that they have chosen to answer their question.
Year 5 & 6	**Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary**
	- Children independently ask scientific questions. This may be stimulated by a scientific experience or involve asking further questions based on their developed understanding following an enquiry. - Given a wide range of resources the children decide for themselves how to gather evidence to answer a scientific question. They choose a type of enquiry to carry out and justify their choice. They recognise how secondary sources can be used to answer questions that cannot be answered through practical work.
Making observations and taking measurements	
EYFS	**Can talk about some of the things they have observed such as plants, animals, natural and found objects (Range 4)** **Makes observations of animals and plants and explains why some things occur, and talks about change (Range 6)**
	- Children explore the world around them. They make careful observations to support identification and noticing change. They use appropriate senses, aided by equipment such as magnifying glasses, to make their observations.
Year 1 & 2	**Observing closely, using simple equipment**
	- Children explore the world around them. They make careful observations to support identification, comparison and noticing change. They use appropriate senses, aided by equipment such as magnifying glasses or digital microscopes, to make their observations. - They begin to take measurements, initially by comparisons, then using non-standard units.

Year 3 & 4	**Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers**
	- The children make systematic and careful observations. - They use a range of equipment for measuring length, time, temperature and capacity. They use standard units for their measurements.
Year 5 & 6	**Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate**
	- The children select measuring equipment to give the most precise results e.g. ruler, tape measure or trundle wheel, force meter with a suitable scale. - During an enquiry, they make decisions e.g. whether they need to: take repeat readings (fair testing); increase the sample size (pattern seeking); adjust the observation period and frequency (observing over time); or check further secondary sources (researching); in order to get accurate data (closer to the true value).
Engaging in practical enquiry to answer questions	
EYFS	**Looks closely at similarities, differences, patterns and change in nature (Range 6)** **Knows about similarities and differences in relation to places, objects, materials and living things (Range 6)**
	- Children use their observations and testing to compare objects, materials and living things.
Year 1 & 2	**Performing simple tests**
	- The children use practical resources provided to gather evidence to answer questions generated by themselves or the teacher. They carry out: tests to classify; comparative tests; pattern seeking enquiries; and make observations over time.
	Identifying and classifying
	- Children use their observations and testing to compare objects, materials and living things. They sort and group these things, identifying their own criteria for sorting. - They use simple secondary sources (such as identification sheets) to name living things. They describe the characteristics they used to identify a living thing.
Year 3 & 4	**Setting up simple practical enquiries, comparative and fair tests**
	- The children select from a range of practical resources to gather evidence to answer questions generated by themselves or the teacher. - They follow their plan to carry out: observations and tests to classify; comparative and simple fair tests; observations over time; and pattern seeking.
Year 5 & 6	**Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary**
	- The children select from a range of practical resources to gather evidence to answer their questions. They carry out fair tests, recognising and controlling variables. They decide what observations or measurements to make over time and for how long. They look for patterns and relationships using a suitable sample.
Recording and presenting evidence	
EYFS	**Talks about why things happen and how things work (Range 5)** **Makes observations of animals and plants and explains why some things occur, and talks about changes (Range 6)**
	- The children talk about their observations and record using photographs, drawings or labelled diagrams.
Year 1 & 2	**Gathering and recording data to help in answering questions**
	- The children record their observations e.g. using photographs, videos, drawings, labelled diagrams or in writing. - They record their measurements e.g. using prepared tables, pictograms, tally charts and block graphs. - They classify using simple prepared tables and sorting rings.
Year 3 & 4	**Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions** **Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables**
	- The children sometimes decide how to record and present evidence. They record their observation e.g. using photographs, videos, pictures, labelled diagrams or writing. They record their measurements e.g. using tables, tally charts and bar charts (given templates, if required, to which they can add headings). They record classifications e.g. using tables, Venn diagrams, Carroll diagrams. - Children are supported to present the same data in different ways in order to help with answering the question.
Year 5 & 6	**Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs**
	- The children decide how to record and present evidence. They record observations e.g. using annotated photographs, videos, labelled diagrams, observational drawings, labelled scientific diagrams or writing. They record measurements e.g. using tables, tally charts, bar charts, line graphs and scatter graphs. They record classifications e.g. using tables, Venn diagrams, Carroll diagrams and classification keys. -Children present the same data in different ways in order to help with answering the question.
Answering questions and concluding	
EYFS	**Talks about the features of their own immediate environments and how environments might vary from one another (Range 6)**

	- Children use their experiences of the world around them to suggest appropriate answers to questions. - The children recognise 'biggest and smallest', 'best and worst' etc. from their data.
Year 1 & 2	**Using their observations and ideas to suggest answers to questions**
	- Children use their experiences of the world around them to suggest appropriate answers to questions. They are supported to relate these to their evidence e.g. observations they have made, measurements they have taken or information they have gained from secondary sources. - The children recognise 'biggest and smallest', 'best and worst' etc. from their data.
Year 3 & 4	**Using straightforward scientific evidence to answer questions or to support their findings** **Identifying differences, similarities or changes related to simple scientific ideas and processes** **Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions**
	- Children answer their own and others' questions based on observations they have made, measurements they have taken or information they have gained from secondary sources. The answers are consistent with the evidence. - Children interpret their data to generate simple comparative statements based on their evidence. They begin to identify naturally occurring patterns and causal relationships. - They draw conclusions based on their evidence and current subject knowledge.
Year 5 & 6	**Identifying scientific evidence that has been used to support or refute ideas or arguments** **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**
	- Children answer their own and others' questions based on observations they have made, measurements they have taken or information they have gained from secondary sources. When doing this, they discuss whether other evidence e.g. from other groups, secondary sources and their scientific understanding, supports or refutes their answer. - They talk about how their scientific ideas change due to new evidence that they have gathered. - They talk about how new discoveries change scientific understanding. - In their conclusions, children: identify causal relationships and patterns in the natural world from their evidence; identify results that do not fit the overall pattern; and explain their findings using their subject knowledge.
Evaluating and raising further questions and predictions	
EYFS	
Year 1 & 2	
Year 3 & 4	**Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions**
	- They identify ways in which they adapted their method as they progressed or how they would do it differently if they repeated the enquiry. - Children use their evidence to suggest values for different items tested using the same method e.g. the distance travelled by a car on an additional surface. - Following a scientific experience, the children ask further questions which can be answered by extending the same enquiry.
Year 5 & 6	**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** **Using test results to make predictions to set up further comparative and fair tests**
	- They evaluate, for example, the choice of method used, the control of variables, the precision and accuracy of measurements and the credibility of secondary sources used. - They identify any limitations that reduce the trust they have in their data. - Children use the scientific knowledge gained from enquiry work to make predictions they can investigate using comparative and fair tests.
Communicating their findings	
EYFS	
Year 1 & 2	
Year 3 & 4	**Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions**
	- They communicate their findings to an audience both orally and in writing, using appropriate scientific vocabulary.
Year 5 & 6	**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**
	- They communicate their findings to an audience using relevant scientific language and illustrations.

Plants	
EYFS	- Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class. - Explore the natural world around them, making observations and drawing pictures of animals and plants.
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)
Living things and their habitats	
EYFS	- Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class. - Explore the natural world around them, making observations and drawing pictures of animals and plants.
Year 1	- Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. (Y1 - Plants) - Identify and describe the basic structure of a variety of common flowering plants, including trees. (Y1 - Plants) - Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. (Y1 - Animals including humans) - Identify and name a variety of common animals that are carnivores, herbivores and omnivores. (Y1 - Animals including humans) - Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets). (Y1 – Animals, including humans) - Observe changes across the four seasons. (Y1 - Seasonal change)
Year 2	- Explore and compare the differences between things that are living, dead, and things that have never been alive. - Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other. - Identify and name a variety of plants and animals in their habitats, including microhabitats. - Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food. - Notice that animals, including humans, have offspring which grow into adults. (Y2 - Animals including humans)
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	- 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. - Construct and interpret a variety of food chains, identifying producers, predators and prey. (Y4 - Animals, including humans)
Year 5	- 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.
Year 6	- 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.

Animals including humans	
EYFS	- Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class. - Explore the natural world around them, making observations and drawing pictures of animals and plants.
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)
Evolution and inheritance	
EYFS	- Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class.
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.
Seasonal changes	
EYFS	- Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class. - Explore the natural world around them, making observations and drawing pictures of animals and plants. - Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.
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	
Materials	
EYFS	- Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class. - Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.
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 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 6	
Rocks	
EYFS	- Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class.
Year 1	- Distinguish between an object and the material from which it is made. (Y1 - Everyday materials) - Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. (Y1 - Everyday materials) - Describe the simple physical properties of a variety of everyday materials. (Y1 - Everyday materials) - Compare and group together a variety of everyday materials on the basis of their simple physical properties. (Y1 - Everyday materials)
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	- 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.
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)
Light	
EYFS	- Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class.
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	- 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. - 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.
Year 4	
Year 5	
Year 6	- Recognise that light appears to travel in straight lines. - Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye. - Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes. - Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.
Forces	
EYFS	- Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class.
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	- Compare how things move on different surfaces. - Notice that some forces need contact between two 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 two poles. - Predict whether two magnets will attract or repel each other, depending on which poles are facing.
Year 4	
Year 5	- 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.
Year 6	
Sound	
EYFS	- Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class. - Explore the natural world around them, making observations and drawing pictures of animals and plants.
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	- 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.
Year 5	
Year 6	
Electricity	

EYFS	- Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class.
Year 1	
Year 2	
Year 3	
Year 4	- 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.
Year 5	
Year 6	- 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
Earth and space	
EYFS	- Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class. - Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.
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

Using the selected themes from the curriculum, children at Layfield develop the appropriate scientific skills, knowledge and understanding, preparing them for the next stage in their education and adult life. The vast majority of children achieve age related expectations in their development, enjoy science lessons and are curious about the world around them.