LIPHOOK
FEDERATION

Science

Knowledge and Skills Progression

EYFS to Year 6

Science Curriculum Progression: Year R to Year 6

Liphook Infant School

Our high-quality science curriculum is planned as a 7-year journey across the Federation and 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; all 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. They are encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes.

By the end of Liphook Infant School

The principal focus of our science teaching is to enable our pupils to 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 are helped to 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 e.g. books, photographs and films.

Our Infant pupils are taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- Asking simple questions and recognising that they can be answered in different ways
- Observing closely, using simple equipment
- Performing simple tests
- Identifying and classifying
- Using their observations and ideas to suggest answers to questions
- Gathering and recording data to help in answering questions

The science content that our pupils are taught includes: plants, animals (including humans), everyday materials, seasonal changes and habitats this is built on further in the Junior School.

Science Curriculum Progression: Year R to Year 6
Liphook Infant School

By the end of Lower Key Stage 2 (Years 3 and 4)

The principal focus of our science teaching is to enable our pupils to 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. Our pupils read and spell scientific vocabulary correctly and with confidence, using their growing word-reading and spelling knowledge.

During years 3 and 4, our pupils are taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- Asking relevant questions and using different types of scientific enquiries to answer them
- Setting up simple practical enquiries, comparative and fair tests
- Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers
- gathering, recording, classifying and presenting data in a variety of ways to help in answering questions
- Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables
- Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
- Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
- Identifying differences, similarities or changes related to simple scientific ideas and processes
- Using straightforward scientific evidence to answer questions or to support their findings.

The science content that our pupils are taught builds on from the infant school and includes: plants, animals (including humans), rocks, light, forces and magnets, habitats, states of matter, sound and electricity.

Science Curriculum Progression: Year R to Year 6
Liphook Infant School

By the end of Upper Key Stage 2 (Years 5 and 6)

The principal focus of science teaching is to enable our pupils to develop a deeper understanding of a wide range of scientific ideas. They do this through exploring and talking about their ideas; asking their own questions about scientific phenomena; and analysing functions, relationships and interactions more systematically. They encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. They also begin to recognise that scientific ideas change and develop over time. They select the most appropriate ways to answer science questions using different types of scientific enquiry, including observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests and finding things out using a wide range of secondary sources of information. Pupils draw conclusions based on their data and observations, use evidence to justify their ideas, and use their scientific knowledge and understanding to explain their findings. Our pupils read, spell and pronounce scientific vocabulary correctly.

During years 5 and 6, our pupils are taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
- recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
- using test results to make predictions to set up further comparative and fair tests
- reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations
- identifying scientific evidence that has been used to support or refute ideas or arguments

The science content that our pupils are taught builds on from earlier learning and includes: living things and their habitats, animals (including humans), properties and changes of materials, earth and space, forces, evolution and inheritance and electricity.

'Greater Depth' is achieved through a focus on **ACE –** tasks enable pupils to **A**pply, **C**onnect and **E**xplore (or **E**xplain) & **E**valuate

Apply	Pupils independently apply their scientific enquiry skills, knowledge and understanding from their current and previous learning and in new contexts with justification.
Connect	Pupils make clear, strong and appropriate connections in and across domains of biology, chemistry and physics debating alternative views and making sense of the increasing complex world around them.
Explore & Evaluate	Pupils are able to independently explore and critically evaluate the scientific learning combining their knowledge and their skills to create questions, hypotheses and conclusions so they are equipped to understand the uses and implications of science, today and for the future.

Science Curriculum Progression: Year R to Year 6
Liphook Infant School

	Year R	Year 1	Year 2
Working scientifically	Describe what they see, hear and feel in the natural world, (including bark, leaves, stones, seeds, warm and cold temperatures) using simple, specific vocabulary. Begin to make predictions and offer explanations about the natural world, based on their observations.	Asking simple questions and recognising that they can be answered in different ways Observing closely, using simple equipment Performing simple tests Identifying and classifying Using their observations and ideas to suggest answers to questions gathering and recording data to help in answering questions.	
Plants	Name common plants and parts of the plant (stem, flowers, root)	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	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.

Science Curriculum Progression: Year R to Year 6

Liphook Infant School

Animals, including humans	Understand how humans grow and change, through the 'All About Me' topic. Name some common farm animals and their young.	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.	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.
Everyday materials	Explore a range of materials found in the environment and describe some basic properties e.g. shiny, reflective, hard, strong, bendy. Relate to stories e.g. 3 Little Pigs, DT e.g. boats & safety e.g. road safety	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.	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 R	Year 1	Year 2
Seasonal changes	Understand some important processes and changes in the natural world around them (changing states of matter) and understand the features of the environment as the seasons change.	Observe changes across the four seasons Observe and describe weather associated with the seasons and how day length varies.	

Science Curriculum Progression: Year R to Year 6

Liphook Infant School

Living things and their habitats	Name common minibeasts, animals and plants. Understand lifecycles (bean plant, butterfly, chicken). Use specific vocabulary and know stages of growth.		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.

Science Curriculum Progression: Year R to Year 6

Liphook C of E Junior School

	Years 3 & 4		Years 5 & 6	
Working scientifically	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, take 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. 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.		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.	
Living things and their habitats	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.	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.	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.	Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals. Give reasons for classifying plants and animals based on specific characteristics.

Science Curriculum Progression: Year R to Year 6

Liphook C of E Junior School

	Year 3	Year 4	Year 5	Year 6
Animals, including humans	Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat. Identify that humans and some other animals have skeletons and muscles for support, protection and movement.	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.	Describe the changes as humans develop to old age.	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 body's function. Describe the ways in which nutrients and water are transported within animals, including humans.
Rocks	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	Recognise that animals 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 changes.			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

Science Curriculum Progression: Year R to Year 6

Liphook C of E Junior School

	Year 3	Year 4	Year 5	Year 6
Properties and changes of materials			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.	
States of matter			Compare and group materials together, according to whether they are solids, liquids or gases. Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C). Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.	

Science Curriculum Progression: Year R to Year 6

Liphook C of E Junior School

	Year 3	Year 4	Year 5	Year 6
Sound		Identify how sounds are made, associating some of them with something vibrating. Recognise that vibrations from sounds travel through a medium to the ear. 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.		
Earth And Space			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.	

Science Curriculum Progression: Year R to Year 6

Liphook C of E Junior School

	Year 3	Year 4	Year 5	Year 6
Forces and magnets	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.		Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. Identify the effects of air resistance, water resistance and friction, that act between moving surfaces. Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.	
Evolution and inheritance				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.

Science Curriculum Progression: Year R to Year 6

Liphook C of E Junior School

	Year 3	Year 4	Year 5	Year 6
Electricity		Identify common appliances that run on electricity. Construct a simple series electrical circuit, identifying and naming its components.		Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit.