



# Science Subject Statement

*This document supports the school vision  
Caring For Others And Courageously Striving  
For Excellence*

Our science curriculum aims to promote pupils' understanding of, and commitment to, our school values; **compassion, resilience, trust** and support pupils' spiritual, moral, social and cultural development; including their understanding of right and wrong, of equal opportunities for all and of the school learner behaviours – to be **aspirational, community-minded, curious, determined and independent.**

We aim to provide science lessons that stimulate children's curiosity about the world around them and offer them first-hand experiences to develop their knowledge and understanding of science and its effects on the world.

## EYFS

In Year R, science forms part of *Knowledge and Understanding of the World* which is one of the six areas of learning. Science is taught in a practical, exploratory way through a balance of child initiated and adult led activities which take place in the classroom and outdoors.

### The aims are to ensure that all pupils:

- develop their natural sense of curiosity for the world around them
- talk about their ideas and ask questions
- explore objects and materials
- look at similarities and differences
- make discoveries for themselves

## Key Stage 1 and Key Stage 2

Science learning is mapped across classes in single subject projects that build on prior knowledge and understanding and promote the development of the skills children need to work scientifically. Each single subject learning projects is planned over a series of lessons beginning with a hook (e.g. visit, artefact, text or video clip); children then have the opportunity to improve skills and develop knowledge and understanding with a clear purpose in mind (e.g. open classroom, performance or publication).

The National Curriculum sets out the purpose of study and aims in science.

### The aims are to ensure that all pupils:

- develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics
- develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them
- are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.

At Long Wittenham School, the teaching and learning of attitudes and skills are a key part of the science curriculum; we aim to

- Encourage the development of positive attitudes to science
- Build on children's natural curiosity so that they develop a scientific approach to problems
- Encourage open-mindedness, self-assessment, perseverance and responsibility
- Foster children's self-confidence to enable them to work independently
- Promote the development of social skills by providing opportunities to work cooperatively with others
- Support children's understanding of scientific processes.
- Facilitate the development of practical and investigative skills; including observing, measuring, predicting, hypothesising, experimenting, communicating, interpreting, explaining and evaluating.
- Promote the use of scientific language, recording and techniques including the use of ICT.
- Enable children to become effective communicators of scientific ideas, facts and data.

### Assessment and progression

- Information about prior attainment recorded on Target Tracker supports lesson planning including differentiation
- Quizzes, mind-maps and teacher questioning are used to assess children's prior knowledge
- Formative assessment (Assessment for Learning) by the teachers (and teaching assistants) is part of every lesson so that mis-conceptions can be addressed as they arise
- As part of each project, weekly quizzes include questions about current and prior learning in science

### Equal opportunities in science

- We ensure that all pupils have the opportunity to gain science knowledge and understanding regardless of gender, race, class, physical or intellectual ability.
- We aim to teach science in a broad global and historical context, using the widest possible perspective and including the contributions of people of many different backgrounds.
- We draw examples from other cultures, recognising that simple technology may be superior to complex solutions.
- We recognise the particular importance of first-hand experience for motivating children with learning difficulties.
- We foster children's developing creativity by asking and encouraging challenging questions and encouraging original thinking.

### Resources

We provide practical resources so children can work scientifically independently, in pairs and in groups and we provide lots of opportunities for pupils to learn outdoors.

### Safety

Teachers refer to subject specific safety guidance Be Safe and <http://www.cleapss.org.uk/>

## Science Programme of Study

### EYFS Understanding of the world

Year R	Explore the natural world around them, make observations and draw pictures of animals and plants. Describe what they see, hear and feel whilst outside. Describe what they see, hear and feel whilst outside. Understand the effect of changing seasons on the natural world around them. 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.
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### Working Scientifically

Year 1	Ask simple questions and recognise that they can be answered in different ways. Use simple equipment to observe closely and perform simple tests. Identify and classify. Use own observations and ideas to suggest answers to questions. Gather and record data to help answer questions.
Year 2	Ask simple questions and recognise that they can be answered in different ways including use of scientific language from the national curriculum. Use simple equipment to observe closely including changes over time. Communicate ideas, what s/he does and what s/he finds out in a variety of ways Perform simple comparative tests. Identify, group and classify. Use own observations and ideas to suggest answers to questions noticing similarities, differences and patterns. Gather and record data to help answer questions including from secondary sources of information.

Year 3 and Year 4	<p>Ask relevant questions and use different types of scientific enquiries to answer them. Set up simple practical enquiries, comparative and fair tests.</p> <p>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. 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.</p>
Year 5 and Year 6	<p>Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.</p> <p>Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. Use straightforward scientific evidence to answer questions or to support findings Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms. Use test results to make predictions to set up further comparative and fair tests.</p>
Year 6 Only	<p>Report and present findings from enquiries, including conclusions, causal relationships, 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. Describe and evaluate own and other people's scientific ideas using evidence from a range of sources. Group and classify things and recognise patterns. Find things out using a wide range of secondary sources of information. Use appropriate scientific language and ideas from the national curriculum to explain, evaluate and communicate own methods and findings.</p>
<b>Animals including humans</b>	
Year 1	<p>Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. Group animals according to what they eat. 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.</p>
Year 2	<p>Understand that animals, including humans, have offspring which grow into adults. 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.</p>
Year 3	<p>Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat. Identify that humans and some other animals have skeletons and muscles for support, protection and movement.</p>
Year 4	<p>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.</p>
Year 5	<p>Describe the changes as humans develop to old age.</p>
Year 6	<p>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.</p>

	Describe the ways in which nutrients and water are transported within animals, including humans.
<b>Materials</b>	
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. 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. Describe 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. Describe in simple terms how fossils are formed when things that have lived are trapped within rock.
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. Recognise 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.
<b>Living things and their habitats</b>	
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. Observe changes across the four seasons. Observe and describe weather associated with the seasons and how day length varies.
Year 2	Observe and describe how seeds and bulbs grow into mature plants. Describe how plants need water, light and a suitable temperature to grow and stay healthy, and describe the impact of changing these. 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.
Year 3	Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. Explore and describe 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. 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 and have an impact on living things.
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 micro-organisms, plants and animals. Give reasons for classifying plants and animals based on specific characteristics.
<b>Forces and magnets</b>	
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 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.
<b>Light</b>	
Year 3	Recognise that he/she needs 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 eyes. Recognise that shadows are formed when the light from a light source is blocked by a solid object. Find patterns in the way that the size of shadows change
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. 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.
<b>Electricity</b>	
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. Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. 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 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.
<b>Sound</b>	
Year 4	Identify how sounds are made, associating some of them with something vibrating.

	<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>
<b>Earth and Space</b>	
Year 5	<p>Describe the movement of the Earth, and other planets, relative to the Sun in the solar system.</p> <p>Describe the movement of the Moon relative to the Earth.</p> <p>Describe the Sun, Earth and Moon as approximately spherical bodies.</p> <p>Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.</p>
<b>Evolution and Inheritance</b>	
Year 6	<p>Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.</p> <p>Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.</p> <p>Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.</p>