Our Science Curriculum

Here at LWPS we recognise that science is a subject that stimulates children's curiosity about the world around them. It allows children of all ages to interact with first-hand experiences, which are vital in developing their knowledge and understanding of science and its effects on the world. We believe that it is very important that children recognise and understand the developments in science that constantly shape and change our lives. Science provides numerous opportunities for questioning; for the children to develop their own experiments and by analysis, draw their own conclusions and answers.

Our science programme of learning holds progression at its heart. High quality inclusive teaching is consistently used throughout the school to target the specific points in learning relevant to each individual child. As with all curriculum areas at LWPS, science is sometimes taught as part of a much wider topic which enables children to understand science in a wider context.

At LWPS we strive to continually enrich our science curriculum through a range of trips and visits including: RAL Rutherford Space Explorers (UKS2), workshops at Bayerlab (KS2), visits to local farms and wildlife parks (KS1) and visits from STEM Ambassadors (whole school-across the year). As a Forest School, we also capitalise on the rich natural resources in the immediate environment to further enhance children's understanding of the world and work closely with our Forest School Leader to ensure that activities carried out off school site link directly to the learning in school.

Determination, Independence, Aspiration, Curiosity and Community-Mindedness taught through our core Christian values of compassion, resilience and trust

Determination As scientists, we expect our children to strive for excellence in all that they do and demonstrate strong intent to get the job done and to do it to the best of their ability. We want them to show this academically as well as in their generosity of spirit within our whole school community. Our children are *resilient* learners, constantly showing their growth mindset in all that they do. In Science, this can be seen in our pupils' desire to do well and build on their prior knowledge and scientific skills.

Independence As scientists as well as future leaders, our children self-organise and self-regulate very well, knowing what to do and where to go for further support if and when they need it. They show great *trust* in one another and the adults around them, knowing who they can go to for help or support if and when needed. We expect our children to exercise their independence at all levels so that they become confident and capable young people ready for their next challenge at each stage of their development.

Aspiration As scientists our pupils are ambitious, showing a drive to follow their dreams and apply the skills and knowledge they are developing to all areas of their learning. They are excited by their programme of study and constantly strive for challenge building their *resilience* as they learn. Our pupils aspire to question the world around them and work scientifically to further their understanding.

Curiosity As scientists we expect our children to be active participants in their learning, always wanting to expand their knowledge and skills. They are driven by rich questioning and reasoning that extends their thinking and challenges their beliefs. We want our children to question their own understanding and beliefs showing an understanding of the world around them, demonstrating *compassion* for those around the world.

Community-Mindedness As scientists, our children understand what it means to be mindful of those in and around our school community. They fundraise extensively, showing *compassion* in all that they do. They understand how we are all different and yet the same, and what impact their own actions have on those around them. They care deeply for one another, are articulate and show tolerance and respect in all that they do.

Our Science Programme of Study

Understanding of the world EYFS	Explore the natural world around them. 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. 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 Scientifcally	Year 1	Ask simple questions and recognise that they can be answered in different ways. Use simple equipment to observe closely. Perform simple tests. Identify and classify Use his/her observations and ideas to suggest answers to questions. Gather and record data to help in answering 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 his/her ideas, what he/she does and what he/she finds out in a variety of ways Perform simple comparative tests. Identify, group and classify. Use his/her observations and ideas to suggest answers to questions noticing similarities, differences and patterns. Gather and record data to help in answering questions including from secondary sources of information.
	Year 3/ Year 4	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. 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.
	Year 5/6	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. Use straightforward scientific evidence to answer questions or to support his/her findings (Year 3 focus) 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.
	Year 6 Only	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. Describe and evaluate their 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 his/her methods and findings.
Animals including humans		
	Year 1	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.
	Year 2	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.
	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.
	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.
Materials		
	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. 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 (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. 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.
	Year 6	This area of science is not taught in Year 6.
Living things and their habitats		
	Year 1 (Plants)	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 (Plants)	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.
Forces and magnets		
	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.

Light	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 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.
Electricity	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.
Sound	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.
Earth and Space	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.
Evolution and Inheritance	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.