



Curriculum Intent and Policy

"Building a life-long love of learning in a safe and happy school."

Science

Principles

We are living in a scientific age and it is vital that children should be able to play a full part in it. Children are, and should be naturally curious about the world around them. Science provides a means of questioning, explaining and understanding natural and physical phenomena. In Early Years we call this 'Understanding the World', and we should keep this overarching thought into KS1 even as the title of the curriculum changes to 'Science'.

At Loughton Manor First School we provide a curriculum based on an investigative approach to science, which is firmly rooted in each child's everyday experiences. Science and scientific understanding can be promoted via 3 main curriculum approaches:

- The embedding of 'The Scientific Method' (ask, test, observe, answer) as a platform through which children develop the fundamental skills of 'Working Scientifically' that ensure they have the fundamental skills to approach scientific thinking in any educational or real-world scenario.
- A range of carefully designed curriculum specific hands-on investigations and experiments designed to promote and stimulate scientific understanding.
- A number of independent investigations and experiments, as well as special events which serve to ensure that sheer pleasure and excitement in science is kindled.

Through our teaching we develop children's knowledge and understanding of important scientific ideas and skills, in accordance with their age, interests and abilities. We teach science in a way that enables children to develop a full range of skills through safe practical and investigative work, research and discussion.

Our commitment to teaching science is:

By the time children leave Loughton Manor First School at the age of seven, they should have experienced and observed phenomena in the natural and humanly constructed world. They should be able 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, comparative tests, and finding things out using secondary sources of information; for example age-appropriate books, news and current affairs.

They will be able 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.

They will have learned fundamental scientific skills and language through first-hand practical experiences as well as having seen videos and media related to advanced ideas and techniques which cannot be safely explored in the classroom.

Children will have a fundamental understanding of the scientific method, and also have been taught to work scientifically as an embedded feature of each science lesson.

Progression in Scientific Understanding

KEY VOCABULARY Understanding The World	Foundation Stage 1	Foundation Stage 2
Seasons, change, Spring, Summer, Autumn, Winter, hot, cold, warm, rough, smooth, hard, soft, prickly, bumpy, tree, plant, flower, bush, leaf, stem, water, sun, seed, bulb, grow, baby, toddler, child, adult, name types of animals, town, city, country, beach, sea, forest, world, travel, melt, heat, cool (Meaning of new words discussed as introduced through stories)	<ul style="list-style-type: none"> • Use all their senses in hands-on exploration of natural materials. • Talk about what they see, using a wide vocabulary. • Explore how things work. • Understand the key features of the life cycle of a plant and an animal. • Begin to understand the need to respect and care for the natural environment and all living things. • Explore and talk about different forces they can feel. 	<ul style="list-style-type: none"> • 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	Year 1	Year 2
measure, observe, compare, measurement, growth, trowel, temperature, bend, squash, twist, stretch, absorb	<ul style="list-style-type: none"> • I can ask simple questions and recognise that they can be answered in different ways • I can observe closely using simple equipment • I can perform simple tests • I can identify and classify • I can use observations and ideas to suggest answers to questions • I can gather and record data to help in answering questions <p><i>Exposure words:</i> draw, label, change, same, table, record, tally, pipette, size, predict, similar, different, sort, group, identify, pattern, height, number, amount, hand lens, ruler, counting cubes, centimetres, meters, suitable, unsuitable, match, test, scientific enquiry, comparative test, research, pattern seeking</p>	
Plants	Year 1	Year 2
YEAR ONE plant, flower, leaf, petals, stem, roots, branch, trunk, roots, wildflower, daisy, garden plant, sunflower, nettle, buttercup, dandelion, deciduous tree, horse chestnut, oak, sycamore, evergreen tree, pine, holly, needles, seed, soil, growth	<ul style="list-style-type: none"> • I can identify and name a variety of common wild and garden plants, including deciduous and evergreen trees • I can identify and describe the basic structure of a variety of common flowering plants, including trees. 	<ul style="list-style-type: none"> • I can observe and describe how seeds grow into mature plants • I can find out and describe how plants need water, light and a suitable temperature to grow and stay healthy

<p>YEAR TWO sunlight, compost, herb, blossom, bulb, shoot</p>		
<p>Animals including humans</p>	<p>Year 1</p>	<p>Year 2</p>
<p>YEAR ONE hair, eyes, face, nose, ears, teeth, mouth, head, neck, arm, elbow, hand, leg, knee, foot light, dark, blind, hear, loud, quiet, noisy, sweet, salty, sour, bitter, savoury, skin, rough, smooth, hard, soft, smell, scent, sniff, stench animal, mammal, fur, wild mammal, pet, bird, wings, beak, feathers, webbed feet, flippers, tail, fins, scales, gills, amphibian, frog, toad, newt, reptile, lizard, crocodile, turtle, carnivore, sharp teeth, herbivore, plants, vegetable, fruit, omnivore</p> <p>YEAR TWO shelter, heart, exercise, physical health, mental health, healthy diet, unhealthy diet, meat, sugar, germs, hygiene, doctor, disease, plaque, gums, filling offspring, egg, parent, baby, child, teenager, life cycle, adolescent, frogspawn, tadpole, froglet, caterpillar, pupa, butterfly, insect, adult</p>	<ul style="list-style-type: none"> ● I can identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals ● I can identify and name a variety of common animals that are carnivores, herbivores and omnivores ● I can describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets) ● I can identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. 	<ul style="list-style-type: none"> ● I can notice that animals, including humans, have offspring which grow into adults ● I can find out about and describe the basic needs of animals, including humans, for survival (water, food and air) ● I can describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.
<p>Everyday Materials</p>	<p>Year 1</p>	<p>Year 2</p>
<p>YEAR ONE material, shiny, dull, rock, heavy, light, object, wood, metal, plastic, glass, wool, solid, liquid, melt, freeze, ice, float, sink, absorb, transparent, opaque</p> <p>YEAR TWO natural material, human-made material, recycle, flexible, rigid, stone, pebble, brick, brittle, flexible, translucent, tough, lightweight,</p>	<ul style="list-style-type: none"> ● I can distinguish between an object and the material from which it is made ● I can identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock ● I can describe the simple physical properties of a variety of everyday materials ● I can compare and group together a variety of everyday materials on the basis of their simple physical properties. 	<ul style="list-style-type: none"> ● I can identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses ● I can find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.

strong, breakable, waterproof		
Seasonal Changes	Year 1	
seasons, autumn, daylight, night, weather, season, rainfall, weather, rain gauge, winter, rainy, snowy, windy, cloudy, frosty, sunny, spring, summer	<ul style="list-style-type: none"> • I can observe changes across the four seasons • I can observe and describe weather associated with the seasons and how day length varies. 	
Living things and their habitats		Year 2
Arctic plants, hibernate, habitat, cactus, desert, rainfall, ocean, seagrass, woodland, fern, moss, microhabitat, spider, snail, diet, food chain, living, dead, never alive		<ul style="list-style-type: none"> • I can explore and compare the differences between things that are living, dead, and things that have never been alive • I can 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 • I can identify and name a variety of plants and animals in their habitats, including microhabitats • I can 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 POLICY

The impact of science teaching and learning at LMFS should be to develop in all young people a lifelong curiosity and interest in the sciences. By providing them with the opportunities to develop essential knowledge, skills, vocabulary, investigative and observation skills we believe that each child can become excited about science, and its relevance to them in their world.

Specific Aims

Children will:

- develop practical skills such as observing, hypothesising, measuring and recording.
- develop skills of predicting, asking questions, making inferences, concluding and evaluating.
- acquire positive attitudes and values such as curiosity, observation and a willingness to listen to and cooperate with others.
- develop thinking skills, e.g. learning to keep an open mind and think divergently.
- demonstrate care for and sensitivity to the living and non-living environment.
- develop a respect for their own health and safety.

Teachers will:

- provide stimulating experiences which promote and foster active learning.
- encourage a questioning approach to science in order for children to explore the world about them with all their senses.
- provide high quality teaching and learning which take every opportunity to provide hands-on and real life experience.
- create opportunities for cross-curricular learning.
- use correct scientific vocabulary correctly and consistently across all year groups.

Planning & Organisation

EYFS In the Foundation Stages, Science is an integral part of the Development Matters thread 'Understanding the World'. Lessons are planned to encompass the UTW objectives in myriad ways and utilise a range of exploratory, questioning and practical opportunities such as observing their natural world, exploring objects and growing plants. Scientific understanding is also embedded in other elements of the EYFS curriculum, such as literacy stimuli that are based on different environments and cultures.

The EYFS team also create Learning Maps which allow the children to take a lead in the direction of their learning. This is particularly significant in the area of Science and Understanding the World, as it is part of our Intent and Philosophies to stimulate, encourage and enable children's own natural curiosity about their world.

KS1 In Key Stage One, we have adopted the White Rose Science scheme of Science planning, which encompasses each of the Science units of coverage from the National Curriculum (both statutory and non-statutory) as well as embedding Working Scientifically throughout each lesson and unit of work for both Year 1 and Year 2. White Rose Science schemes of learning also cover scientific questions around sustainability and the planet, and help children develop an empathy for the local and wider environment. Lessons are sequenced in small steps, reinforce prior learning and vocabulary, as well as increasing in depth and challenge as children progress through each unit.

The White Rose Science scheme provides an extremely solid base for Teaching and Learning in Science at LMFS, however, we also have experienced and skilled teachers who are able to use their professional judgement to successfully schedule and enhance the scheme in order to make the best use of the school's resources, community and environment in order to maximise the best possible impact and outcomes for children's enjoyment of and progression in Science.

Given that it is imperative that all classroom staff understand and use correct and consistent scientific vocabulary, detailed planning accompanies each unit planning. This highlights and explains key vocabulary to be used in the forthcoming topic and is also a useful tool for pre-empting children's potential scientific misconceptions.

Each year we hold a whole school Science week. The aim of this is to inspire and motivate children in their science learning. The work is of an investigative nature, involves demonstrations by visiting practitioners as well as hands-on investigations, and makes science meaningful and exciting.

Teachers plan together in year group teams to ensure continuity and progression between and within each key stage.

Teaching Methods

There are a wide range of teaching methods by which science can be taught depending on the age, interests and abilities of the children and the particular topic that is being covered.

Group work provides children with the time and space to carry out relevant practical work and make the most of the opportunities for discussion. We offer a range of grouping from individual teaching to whole class sessions (see Curriculum Policy).

Through experiment, practice and discussion, children gain core knowledge around:

- Scientific vocabulary
- 'Working scientifically' skills including systematic and careful observations and following practical scientific methods
- The gathering and interpretation of straightforward scientific evidence
- The use of everyday materials and scientific equipment to solve science problems
- Articulating scientific concepts and using five types of science enquiries

Cross Curricular Links

There are many links with other subject areas and much effective science teaching can be carried out through the arts, maths and literacy.

Opportunities are taken to capitalise on appropriate links between subjects especially in the area of the environment, making full use of the school grounds. We have a school woodland and garden areas. These areas enable the children to have greater access to experiential and observational stimuli, and every opportunity is made to utilise them to their full potential.

Outdoor Learning

At Loughton Manor First School we pride ourselves on our school grounds and benefit from a community rich with learning opportunities. We recognise the importance of Outdoor Learning (OL) on our children's development and plan OL opportunities whenever possible. We have a specialist practitioner who is trained as a Forest School Leader. A termly rota ensures that all children have time at forest school. We find that children routinely use their enjoyment of and skills learned in Forest School within Science lessons, and thus that these outdoor experiences augment their understanding of their bodies, senses, skills and local environment.

Assessment

As in all areas of the curriculum there is ongoing teacher assessment. In addition, an aspect of science is assessed each half term for each child. The White Rose Science scheme of work includes end-of-unit assessment resources to allow for whole-class, small group or individual summative assessment. A range of evidence is kept, and results are recorded using Target Tracker software. At the end of Key Stage One, Year Two teachers collate all relevant data and assess each child's attainment.

Resources

Resources for science are located in the science cupboard situated in the Year 2 shared area. Each class teacher will ensure that they have all the necessary resources available in good working order to meet the science topic requirements.

In the event of equipment becoming damaged or broken it must be reported to the Science Subject Leader so that it can be replaced.

Some additional graphic resources are situated on the staff shelves in the resource room.

Equal Opportunities

All children will have equal access to the science curriculum irrespective of race, gender or mobility (see Equal Opportunities Policy and Racial Equality Policy).

Adaptive teaching

In planning science, we structure activities to ensure success for all children by scaffolding accordingly for the needs of the class. Able children are given the opportunity to undertake work of a more challenging nature where appropriate.

We realise that a child may have considerable scientific understanding without having the writing skills to be able to record their work. Therefore, an ability to produce written work is not a criterion for attainment in science and a range of methods for recording their findings is encouraged.

Some children will need additional classroom support for science activities.

Health and Safety

Teachers accept responsibility to plan safe activities and ensure that resources are in a safe condition before use with the children. As with all our teaching, children will work within the school's Health and Safety Policy.

Monitoring and Evaluation

Monitoring and evaluation will be within the remit of the Maths, Science, Computing Team, a curriculum team which meets half termly. Their annual SIP Action Plan will identify aspects for development/improvement that help to support and sustain our high standards. The action plan details aspects to be monitored and evaluated, and identifies these members of staff/governors involved.

Roles and Responsibilities

The Science Subject Leader together with the head teacher, Curriculum Team and the governing body is responsible for the review of the subject policy. It is the Science Leaders role to support colleagues, review planning and ensure that the necessary resources are in school in order to deliver the National Curriculum Programmes of study. The Science Subject Leader will keep abreast of current thinking within the teaching of Science and communicate these ideas to the school staff.