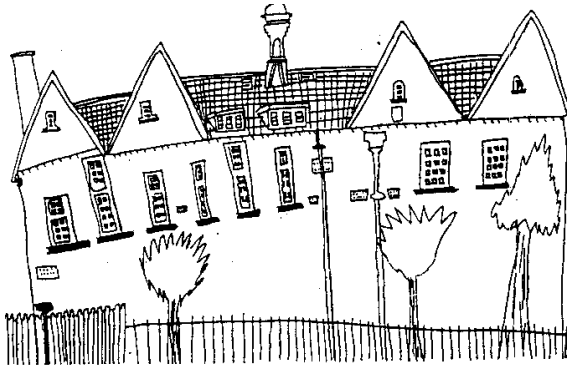
# Science at

# Letchmore Infants' & Nursery School



## Subject Intent

At Letchmore Infants' and Nursery school, we
recognise the importance of science and aim to
provide children with an awe-inspiring and
ambitious science curriculum that equips
them with the scientific skills and knowledge that
will help them to thrive now and in the future.
Children are encouraged to ask and answer their
own scientific questions and develop their natural
curiosity. Lessons are carefully sequenced to
build upon children's prior learning to ensure clear



## Statement

progression of curriculum content and working scientifically skills. Children's learning is embedded in real-life, practical experiences and science teaching and learning is enriched by wider STEM links within our local, science-rich community. The children can consolidate the skills they have been taught in their science lessons, in their continuous and enhanced provision. Developing children's science capital lies at the heart of our curriculum and science is enriched through a wide range of STEM visits, workshops, school trips and inspirational days.

Whole School Sport Improvement Plan Aim/Objectives

1. To develop distributed leadership across the school based on the belief that everyone can be a leader.
2. To immerse our children in an embed an inspiring, creative and empowering curriculum that equips them for today and tomorrow.
3. To further enrich our nurturing culture and environment through a whole school ethos of positive mental health and wellbeing for all.

We deliver our curriculum through a balance of 'continuous provision' and adult-led learning. For much of the day, the children embed their learning, knowledge and skills through Child Initiated Learning (CIL) and a range of enrichment activities. CIL provides our children with opportunities to work with, and alongside, their peers and to share resources and problem solve, harnessing independent skills that equips them for a successful transition to their next stage in learning.

Teachers check learners' understanding systematically, identify misconceptions and providing clear, direct feedback. They respond and adapt their teaching to help learners remember the long term the content they have been taught and to integrate new knowledge into larger concepts. All staff are continually assessing children's learning during whole class sessions, group work and play-based learning. Staff are able to provide for next steps of learning within our provision and for some children, interventions may be needed to give them the additional support they need to make their next steps. Evidence of formative assessment may be found in assessment notes, books, floor books and learning journey walls and books. All staff know the children well and are able to discuss their starting points, progress and next steps in learning.

## Implementation

| | Nursery | Reception | Year 1 | Year 2 |
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| **Working Scientifically** | • Magnifiers looking for evidence<br>• Make a graph<br>• Observations | • Asking simple questions<br>• Begin sorting and grouping<br>• Make simple observations<br>• Begin to use simple equipment<br>• Begin to explain similarities and differences<br>• Find ways to solve problems<br>• Notice patterns in their experiences | • asking simple questions and recognising that they can be answered in different ways<br>• observing closely, using simple equipment<br>• performing simple tests<br>• identifying and classifying<br>• using their observations and ideas to suggest answers to questions<br>• gathering and recording data to help in answering questions | • asking simple questions and recognising that they can be answered in different ways<br>• observing closely, using simple equipment<br>• performing simple tests<br>• identifying and classifying<br>• using their observations and ideas to suggest answers to questions<br>• gathering and recording data to help in answering questions |
| **Plants** | • New life plants/animals<br>• Planting beans, cress and sunflowers<br>• Variety of foods, how and where they grow | • Make observations about animals and plants and suggest how some things occur | **Working towards ARE**<br>• make observations of plants, including flowers and vegetables they have planted<br>• identify the leaf, root, stem and flower of a plant<br>• identify the trunk, branch, roots and leaves of a tree | **Working Towards ARE**<br>• know that flowering plants produce seeds which grow into new plants<br>• know that some plants have bulbs from which they grow<br>• make observations of plants over time |
| | | | **Working at ARE**<br>• know that plants produce seeds<br>• identify differences between plants<br>• identify and describe the basic structure of a variety of common flowering plants, including trees<br>• name some common plants<br>• name some plants that live in the garden<br>• name some plants that live in the wild<br>• name some trees in the local | **Working at ARE**<br>• explore how plants from seeds and bulbs grow<br>• describe what happens to bulbs during the plant cycle as they grow<br>• describe what happens to a seed as it grows and develops<br>• describe what they observe as new plants grow<br>• observe and describe how seeds and bulbs grow into mature plants |

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| | | | environment<br>• recognise that different plants live in the local environment<br>• use simple identification guides to name plants in the local environment<br>• identify and name a variety of common wild and garden plants, including deciduous and evergreen trees | • suggest how to find out about what plants need in order to grow well<br>• recognise that plants are living and need water, light and warmth to grow<br>• describe differences between plants grown in the light and in the dark<br>• find out and describe how plants need water, light and a suitable temperature to grow and stay healthy |
| | | | **Greater Depth**<br>• compare and contrast different plants<br>• sequence pictures of how plants changes over time<br>• describe how deciduous trees changes throughout the year<br>• explain why some plants are only seen at certain times of the year | **Greater Depth**<br>• explain how to look after a variety of plants<br>• compare the plant cycle for a plant from a seed with that from a bulb<br>• know that a seed and bulb both contain everything a plant needs to grow<br>• explain that seeds and bulbs do not need light to germinate and identify how this is different to the needs of a plant<br>• explain how plants in the desert survive with little water and plants in the rainforest survive with little light |
| | Key Vocabulary: plant, flower, leaf, tree, food, grow, big, small, beans, cress, sunflowers | Key Vocabulary: animal, plant, grow, flower, roots, adult, baby, same, different, stem, tree, leaf, water, seed, | Key Vocabulary: Roots, stem, wild plants, garden plants. petal, tall, taller, tallest, wild, trunk, similar, different, within, under, next to, soil, blossom, buds, fruit, leaves, branch, bulbs, shrub, alive, | Key Vocabulary: Observation, growth, compare, record, measure, diagram, comparative tests, life cycle, life process, grain, seedling, bulb, buds, shoot, water, sun light, seeds, nuts, fruit |

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| | | | vegetables, grass, garden, habitat, deciduous, earth, evergreen, compost, non-living, living, not alive, dead, artificial<br>Names e.g. daffodil, daisy, sunflower, rose, lavender, tulip, snowdrop, holly, dandelion, oak, beech, chestnut, pine | stones, warm, grow, temperature, geminate |
| **Animals, including humans** | • Myself and my family- growth and healthy life style<br>• How I have changed, young/old<br>• Record animal moves and sounds<br>• Find out information about animals using the computer<br>• New life plants/animals<br>• Life cycle of a butterfly Own caterpillars in the nursery | • What makes us special – comment and ask questions about themselves and others<br>• Make observations about animals and plants and suggest how some things occur | **Working towards ARE**<br>• identify and name a selection of animals<br>• make observations of animals<br>• know that animals eat different types of food<br>• use their observations to point out differences between humans and other animals and between animals and non-living things<br>• identify and locate the sense organs<br>• use senses to describe textures, sounds and smells | **Working towards ARE**<br>• recognise that animals produce young<br>• notice that animals, including humans, have offspring which grow into adults<br>• recognise changes that take place as animals get older<br>• identify the offspring of a selection of different animals<br>• recognise that exercise is important<br>• name some types of food<br>• recognise that an adequate diet and exercise are necessary for them to grow and stay healthy |
| | | | **Working at ARE**<br>• identify and sort animals into different groups<br>• name the different groups of animals<br>• identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals<br>• recall and use the words: carnivore, herbivore and omnivore | **Working at ARE**<br>• describe some differences they observe between babies and toddler<br>• explain that adult animals no longer grow<br>• make comparisons of the differences they observe between babies and toddlers<br>• find out about and describe the basic needs of animals, including |

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| | | | • identify and name a variety of common animals that are carnivores, herbivores and omnivores<br>• identify the food of some common animals<br>• describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)<br>• compare differences in texture, sounds and smells<br>• name and locate the basic parts of the human body<br>• draw and label a simple body outline | humans, for survival (water, food and air)<br>• describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene<br>• identify some types of food that make up their diet and name some examples of each<br>• describe some of the types of food that they eat |
| | | | **<u>Greater Depth</u>**<br>• group animals that belong to: carnivores, herbivores and omnivores<br>• describe differences between the different animal groups (e.g. birds have feathers but mammals have fur)<br>• identify animals which are more likely to be seen in different seasons<br>• explain why some animals are only seen at night | **<u>Greater Depth</u>**<br>• explain how to look after a pet describing what it needs to survive<br>• use evidence to show that adult animals no longer grow<br>• use evidence to show that children of the same age are not all the same size<br>• use evidence to show that older children are generally taller than younger children |
| | Key Vocabulary: healthy, unhealthy, young, old, same, different, animal, plant, baby, grow | Key Vocabulary: Animal, head, legs, arms, knee, elbow, neck, face, feet, hands, bread, potatoes, apples, cereals, rice, meat, fish, milk, running, jumping, | Key Vocabulary: Carnivores, herbivore, omnivore,<br>Body parts: eyes, ears, elbows, hair, mouth, nose, teeth, paw, hoof, tail, fin, | Key Vocabulary: Living, dead, never alive, habitats, micro-habitats, food, food chain, leaf litter, shelter, sea shore, woodland, ocean, rainforest, conditions, desert, damp, shade, |

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| | | swimming, walking, chicken, hen, kitten, cat, puppy, dog, duckling, duck | shell, skin, wings, beak, fur, scales, feathers<br>Fish: goldfish, tuna, salmon<br>Birds: blackbird, magpie, robin, sparrow, crow, swan. Reptiles: snake, lizard, tortoise Mammals: mouse, horse, cow, sheep, hamster, rabbit<br>Amphibians: frog, toad, newt<br>Senses: feel, hear, smell, see, taste, touch | Baby, toddler, adult, eggs, fruit, vegetables, water, fibre, meat, fish, cheese, beans<br>washing, exercise, diet<br>offspring |
| **Living things and their habitats** | • Looking after the animals in the nursery garden (birds, minibeasts, guinea pigs)<br>• Going on a bear hunt- environments small world<br>• Nocturnal animal's tuff spot, habitats | • Dinosaurs and their habitats<br>• Show care and concern for living things in the environment | | **Working towards ARE**<br>• use their observations to point out differences between animals, plants and non-living things<br>• recognise that plants provide food for humans and other animals within an environment<br>• identify some local habitats<br>• name a few of the organisms that live in a particular habitat<br>**Working at ARE**<br>• with help, use keys to identify some animals and plants<br>• recognise that different plants live in the local environment<br>• describe the simple features of habitats<br>• recognise a microhabitat as a small habitat (e.g. leaf litter, woodlice under stones)<br>• describe some microhabitats<br>• identify and name a variety of plants and animals in their |

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| | | | | habitats, including micro-habitats<br>• recognise similarities and differences between plants and animals<br>• explore and compare the differences between things that are living, dead, and things that have never been alive<br>• explain differences between living and non-living things in terms of characteristics such as movement and growth<br>• construct a simple food chain (e.g. grass, cow, human)<br>• 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<br>• suggest reasons why different plants and animals are found in the different environments<br>• 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 |

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| | | | | **Greater depth**<br>• compare animals found in familiar habitats with unfamiliar habitats<br>• compare plants found in familiar habitats with unfamiliar habitats<br>• use different factors to compare a range of habitats (e.g. water, light, temperature) |
| | Key vocabulary: polar bear, ice, grass, plant, animal, nocturnal, night, day, birds, minibeasts, guineapigs | Key vocabulary: Dinosaurs, habitats, animals, food, weather | | Key Vocabulary: Living, dead, never alive, non-living, keys, breathe, grow, eat, have babies, habitats, food, food chain, leaf litter, shelter, sea shore, woodland, ocean, rainforest, conditions, desert, damp, shade, predator, prey |
| **Everyday materials** | • Knowing and using their senses.<br>• Describe things using their senses<br>• Naming settings and features of small world play sets<br>• Floating and sinking materials<br>• Talk about change, liquid spreading. Colour change.<br>• Experiment with things that float and sink, develop vocabulary | • Find out about similarities and differences in relation to materials, objects, places and living things | **Working towards ARE**<br>• name some common materials<br>• name some common objects around the school and home<br>• make observations of common objects and the different materials they are made of<br>• communicate these observations using descriptive words (e.g. *bendy, rough, hard)* | **Working towards ARE**<br>• identify uses of some common materials<br>• give a reason why a material is suitable for its job<br>• identify materials that can be easily changed with force<br>• identify materials that cannot be easily changed with force<br>• describe pushes and pulls needed to change a material as big or small |
| | | | **Working at ARE**<br>• distinguish between an object and the material from which it is made<br>• identify some naturally occurring materials: wood, rock, water | **Working at ARE**<br>• recognise that some materials will have more than one property which increases its suitability for its purpose (e.g. glass is transparent, rigid and |

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| | | | • identify some man-made materials: glass, metal, plastic<br>• identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock<br>• identify some properties of materials (e.g. see through, waterproof, absorbent)<br>• describe the simple physical properties of a variety of everyday materials<br>• compare and group together a variety of everyday materials on the basis of their simple physical properties (both visible and non-visible) | weatherproof)<br>• identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses<br>• suggest several reasons why a material may or may not be suitable for a particular purpose<br>• find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching<br>• describe changes in shapes as a result of the action of pushes, pulls and twists |
| | | | **Greater Depth**<br>• make predictions about which materials will float and sink<br>• name materials which have lots of different uses (e.g. paper- wrapping paper, tissue paper, writing paper, birthday card)<br>• describe objects that are made from lots of different materials<br>• names objects that are sometimes made from different materials (e.g.: spoons- plastic, wooden, metal)<br>• explain why people started using plastic bags rather than paper bags | **Greater Depth**<br>• *explain why some materials change shape when a force acts (i.e. push, pull, twist, stretch) as a result of their properties*<br>• explain why one material may be more suitable for a purpose than another by discussing properties<br>• explain why plastics cause problems in the oceans<br>• explain the importance of reusing and recycling plastic<br>• describe how swimsuits have changed over time and how the fabric is now more suitable |

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| | | | | • describe how scientists have invented new materials (e.g. Macintosh, Dunlop) |
| | Key Vocabulary: senses, floating, sinking, heavy, light, change | Key Vocabulary: material, same, different, hard, soft, shiny, smooth, rough | Key Vocabulary: Hard, soft, stretchy, stiff, shiny, dull, rough, smooth, bendy/not bendy, waterproof/not waterproof, absorbent, opaque, | Key Vocabulary: Fabric, rubber, cars, rock, paper, cardboard, wood, metal, plastic, glass, brick, transparent, waterproof, insulate, keep warm, hard, rigid, strong, flexible, squash, stretch, twist, bend |
| **Seasonal changes** | • Weather and seasonal changes<br>• Also linked to Forest School sessions<br>• What we wear in different types of weather<br>• Baby farm animals, seasonal changes and signs of Spring in the school environment<br>• Going on a bear hunt – environments – literacy link | • Changes in the outdoor environment (signs of Autumn) – observation and questioning | **Working towards ARE**<br>• name the four seasons<br>• recall simple changes associated with each season<br>observe and name types of weather (e.g. rain, sun, wind, clouds)<br>**Working at ARE**<br>• observe changes across the four seasons<br>• identify what to observe<br>• use descriptive words, photos and pictures to record changes<br>• collect evidence of changes (e.g. leaves, seeds, flowers)<br>• observe and describe weather associated with the seasons and how day length varies<br>• identify what to measure about the weather<br>• use prepared tables and charts to record data | |

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| | | | **Greater Depth**<br>• use secondary data to describe weather in another setting<br>• explain why animals are easier to spot at different times of year (e.g. migrating birds, hibernating animals) | |
| | Key Vocabulary: weather, Autumn, Spring. Summer, Winter, hot, cold, rain, sun | Key Vocabulary: season, Autumn, Spring, Summer, Winter, weather, change, rain, snow, sunshine, wind, same, different | Key Vocabulary: Seasons: Autumn, Spring, Summer, Winter, deciduous, evergreen, shoot, fruit, earth, seeds, leaves, flowers, weather types: rain, hail, snow, ice, frost, sun, showers, wind, reproduce, babies/adults, life cycles, birds, insects, cold, warm, hot, sunrise, sunset | |
| **Light and Dark** | • Torches light and dark. How they work, what they do?<br>• Light and dark-times of day | | | |
| | Key Vocabulary: light, dark, night, day, bright, torch. bulb | | | |

## Vulnerable groups and children with SEND

Class teachers will make adaptations to the curriculum appropriate to the needs of individual children. Learning content, activities and outcomes will be differentiated to ensure **all** pupils are able to participate fully and are challenged appropriately to make progress. Resources will be adapted as appropriate to ensure **all** pupils can access **all** aspects of learning. Adaptations may include use of visual and concrete resources, use of a whiteboard for recording, pre-teaching key vocabulary and concepts, assessment of understanding and progress through discussion rather than through what a child has recorded. Teachers will work in collaboration with the child, parents/carers, SENCo, LSAs and external professionals to understand and respond to the children's individual needs.

## Whole school

| | Action/Event | Impact |
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| | Monthly Science Newsletter | To increase the visibility of science in school. To share whole school initiatives e.g. scientist of the month and increase engagement and raise science capital whilst challenging some stereotypes and misconceptions. To include links to fun experiments that can be enjoyed at home linked to 'Science through Stories.' |
| | British Science Week | To develop parental and community links, engaging children in the wider science capital and making real-life, meaningful connections with their local community to develop their science capital. Make connections with problem solving linked to STEM. Develop whole school science ethos and embed principles with hands-on learning experiences. |
| | STEM Ambassador Assemblies | |
| | Parent and pupil voice reflected in curriculum plans | |
| | Antarctic explorer visit | British Antarctic Survey visit. Make real-life links, raise science capital and engagement as well as aspirational careers. |
| | Year 2 Space Inspirational Day | To increase engagement and develop reasoning skills. |
| | Year 2 Planetarium Visit | To develop community links and raise science capital. |
| | Year 2 Star-gazing evening | |
| | Visit to STEM Discovery Centre | |
| | Growing a butterfly | Nursery class linked to 'New life' topic. Raising science capital and developing awe and wonder. |
| | Forest school | Children to explore and experience science in everyday life. |
| | Year 1 Dinosaur Inspirational Day | To increase engagement and develop reasoning skills. To apply pre-learned knowledge in a real-life context. |
| | Climate Action Plan | To create a greener, healthier learning environment while fostering environmental responsibility among pupils, staff and the wider community |

## Curriculum Calendar

| | Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
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| Nursery | Senses, Weather & Seasonal changes, Growth | Light & dark, Weather & Seasonal | Light & dark, Weather & Seasonal | New life (plants & animals), | Planting, Foods & where they grow, Lifecycle of a | Life in the sea, Floating & sinking |

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| | & healthy lifestyle | changes, Nocturnal animals & habitats | changes, Floating & sinking | Seasonal changes (signs of Spring) | butterfly, Seasonal changes | |
| Reception | Harvest, Dinosaurs & their environment, Seasonal changes | Seasonal changes (Winter) | Human body | The 4 Seasons (awe & wonder from the natural world) | Local green spaces (mini-beasts & plants), Life cycles, Sea creatures & their habitats | Space, Hot & cold places Habitats, Materials |
| Year 1 | Seasonal changes (tree diary), Health & hygiene | Materials & their properties | Animals from different continents & their habitats | Animals in the local area, Bird feeders, Pets, Tree diary | Plants, Dinosaurs | Materials |
| Year 2 | Living things & their habitats, Animals including humans | Living things & their habitats, Animals including humans | 'The apprentice gardener' (growing & planting) | 'The apprentice gardener' (growing & planting) | Materials & their properties | 'Take care' (changing & staying fit & healthy) |

** Specific times of coverage may change as term lengths usually vary from academic year to academic year. Also, 'planning in the moment' may take precedence. **

## Learning Outcomes

| | **Expected learning outcomes by the end of Early Years Foundation Stage** | **Expected learning outcomes by the end of Key Stage 1** |
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| **Working Scientifically** | Children make simple observations<br>They suggest some similarities and differences<br>Children can ask simple questions<br>Children can observe and talk about changes | ask their own questions about what they notice<br>use different types of scientific enquiry to gather and record data, using simple equipment where appropriate, to answer questions<br>observing changes over time |

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| | | noticing patterns<br>grouping and classifying things<br>carrying out simple comparative tests<br>finding things out using secondary sources of information<br>communicate their ideas, what they do and what they find out in a variety of ways |
| **Animals, including Humans/living things & their Habitats** | Children know about similarities and differences in relation to places, objects, materials and living things | name and locate parts of the human body, including those related to the senses [year 1], and describe the importance of exercise, a balanced diet and hygiene for humans [year 2] |
| | They make observations of animals and explain why some things occur, and talk about changes | describe the basic needs of animals for survival and the main changes as young animals, including humans, grow into adults [year 2] |
| | They talk about the features of their own immediate environment and how environments might vary from one another | describe the basic needs of plants for survival and the impact of changing these and the main changes as seeds and bulbs grow into mature plants [year 2] |
| | | identify whether things are alive, dead or have never lived [year 2] |
| | | describe and compare the observable features of animals from a range of groups [year 1] |
| | | group animals according to what they eat [year 1], describe how animals get their food from other animals and/or from plants, and use simple food chains to describe these relationships [year 2] |
| **Seasonal Changes** | They talk about the features of their own immediate environment and how environments might vary from one another | describe seasonal changes [year 1] |
| **Plants** | They make observations of plants and explain why some things occur, and talk about changes<br><br>They talk about the features of their own immediate environment and how environments might vary from one another | name different plants and animals and describe how they are suited to different habitats [year 2] |
| **Everyday Materials** | Children know about similarities and differences in relation to places, objects, materials and living things | distinguish objects from materials, describe their properties, identify and group everyday materials [year 1] and compare their suitability for different uses [year 2] |