Leonard Stanley Primary School

Science

Statement of Intent, Implementation and Impact

Intent: *Why do we teach this? Why do we teach it in the way we do?*

At Leonard Stanley Primary we want our children to love science. We want them to grow up with aspirations for careers in science, whether it be as astronauts, nurses, forensic scientists, zoologists or engineers.

Our science curriculum is exciting and challenging. We aim to equip learners with not only the minimum statutory requirements of the National Curriculum but to prepare them for the opportunities, responsibilities and experiences of later life. We want our children to remember their science lessons in our school, to treasure these memories and embrace the scientific opportunities they are presented with. We want to ensure that we teach an inclusive curriculum that allows children with SEND or who are disadvantaged to have the same opportunities as everyone else. We also want to ensure the children learn about key scientists and key inventions internationally and within our county, thus providing a rich cultural capital.

Our teaching of science prioritises the development of scientific knowledge and vocabulary whilst working scientifically, e.g. asking questions, planning and setting up investigations, observing, measuring and recording.

Our science curriculum promotes curiosity and a love for learning. It is ambitious and empowers our children to become independent and resilient. We enrich their time in our school with memorable, unforgettable experiences and provide opportunities which are normally out of reach – this promotes a love of science that reaches far beyond the classroom.

Implementation: *What do we teach? What does this look like?*

In September 2023, we adopted Developing Experts as our main science resource, confident that it aligns well with our curriculum vision, school ethos and our children's needs, whilst encompassing the National Curriculum Programme of Study. Developing Experts ensures full coverage and progression of knowledge and science enquiry skills from Reception to Upper Key Stage 2. It provides consistency and structure so that prior learning is built upon effectively so that ample opportunities are provided to repeat and embed key learning, knowledge and skills.

Early Years: Preschool and The Reception Year

In the EYFS, science is included within the 'Understanding of the World' area of learning. As with other learning in Preschool and Early Years, our children will mainly learn about science through

carefully structured and planned continuous provision opportunities both inside the classroom and outdoors. This includes:

- Using water trays to explore floating and sinking.
- Using sand trays and mud kitchens to develop their understanding of materials.
- Using magnifying glasses, tweezers, clipboards and notebooks when exploring the natural world.
- Visits from vets, nurses and firefighters and regular welly walks to help children develop their experiential knowledge and sense of the world around them.

These planned opportunities are linked to other areas of the curriculum. Activities such as these will help children develop important skills such as observation, prediction and critical thinking. Scientific vocabulary is well-modelled by adults working with the children.
In Reception class, we use Developing Experts as a resource to plan and deliver high quality science learning opportunities.

The following table shows how we use the Development Matters guidance to plan science learning opportunities for children in our Early Years setting, so that they are able to achieve the Early Learning Goals that are linked to science:

	Development Matters 3 & 4-year-olds will be learning to:	Development Matters Children in Reception will be learning to:	Statutory Framework Early Learning Goals
UTW	• Use all their senses in hands-on exploration of natural materials. • Explore collections of materials with similar and/or different properties. • Talk about what they see, using a wide vocabulary. • Begin to make sense of their own life-story and family's history. • Explore how things work. • Plant seeds and care for growing plants. • 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. • Talk about the differences between materials and changes they notice.	• Explore the natural world around them. • Describe what they see, hear and feel whilst outside. • Recognise some environments that are different to the one in which they live. • Understand the effect of changing seasons on the natural world around them.	**The Natural World** • 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.
C & L	• Understand 'why' questions, like: "Why do you think the caterpillar got so fat?"	• Learn new vocabulary. • Ask questions to find out more and to check what has been said to them. • Use talk to work out problems and organise thinking and activities. Explain how things work and why they might happen. • Use new vocabulary in different contexts.	**Listening Attention & Understanding** • Make comments about what they have heard and ask questions to clarify their understanding.
PSED	• Make healthy choices about food, drink, activity and toothbrushing.	• Know and talk about the different factors that support their overall health and wellbeing: regular physical activity, healthy eating, toothbrushing, sensible amounts of 'screen time', having a good sleep routine, being a safe pedestrian	**PSED - Managing Self** • Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices.

Science in Key Stage 1 and 2

The content of science teaching and learning is set out in the 2014 National Curriculum for primary schools in England. Within this, certain topics and areas are repeated across year groups, meaning that children may revisit a particular topic in each year of primary school but with increasing difficulty and with a different focus each time.

In Biology, for example, the area of animals including humans is examined in every single year group, with a very clear progression of knowledge and understanding over the six years:

- In Year 1, this involves looking at the human body, recognising animal groups and sorting these animals.

- By Year 6, this will have developed into knowing the internal structure of the human body in relation to circulation, classifying living things based on more complex characteristics and exploring scientific research into their classification.
- Alongside these areas runs the **Working Scientifically** element. This focusses on the skills the children need to become accurate, careful and confident practical scientists. Children are expected to master certain skills in each year group and there is a very clear progression of these set out for us to refer to.

Science is taught discretely throughout the school every week using the Developing Experts programme.

- We use a progression of knowledge document and a progression of skills document to ensure a clear understanding of prior learning, current expectations and where the learning is going next.
- The school has a detailed science curriculum map for each year group, illustrating the topics and content taught in each class.
- There is a strong focus on learning specific scientific vocabulary and a list of 'rocket words' has been produced for each science lesson. The interactive rocket words quiz enables teachers to assess the acquisition of this new vocabulary.
- Lessons are practical whenever possible, with scientific investigations that develop children's scientific enquiry skills (e.g. asking questions, setting up tests, recording and evaluating data).
- A range of scientific enquiry types are covered in each class (e.g. research, observation over time, identifying, grouping and classifying).
- Adaptations are made in every lesson to ensure that children in <u>all</u> key groups, including SEND, access the knowledge and scientific enquiry.
- 'Expert Films' are shown regularly to show how the science is applied in real-life contexts and in real careers that children can aspire to.
- Tasks are set as 'mission assignments', encouraging children to explore, apply and consolidate new science knowledge, vocabulary and enquiry skills.
- Children learn about key scientists and key inventions within each unit of work.
- We use cross-curricular links and provide outdoor learning opportunities as much as possible to help strengthen children's long-term memory by making valuable connections. For example, in Autumn Term in Year 5, children learn about 'Living Things and Their Habitats' within an overarching text-based 'Explorers' topic, which includes science workshops at Westonbirt Arboretum and their science learning developed further within Guided Reading, English and Geography lessons.
- Classroom displays and knowledge organisers in books help children know and remember scientific knowledge and vocabulary.
- The hall display celebrates children working scientifically throughout the school.

Assessment

- To ensure that the coverage of science meets the needs of the learners, each class discusses and assesses the prior knowledge of the children at the beginning of their science topic using a 'before quiz'. This enables teachers to identify any knowledge and skills that need to be

focussed on within the unit and also to identify any misconceptions that need to be addressed during lessons.

- We also use a 'common misconceptions' document that enables teachers to identify common misconceptions before teaching each unit.
- We assess predominantly using ongoing formative assessments in class, with teachers giving immediate oral feedback to address any misconceptions that arise. Teachers reflect upon the learning using 'feedback sheets', which identify teaching points for the next lesson for the class as a whole, or to identify individuals or groups who require further support.
- Assessment information is gathered through observations and discussions with children, using Developing Experts mini assessments and rocket word quizzes during lessons and at the end of each unit with the Developing Experts unit test.
- End of unit assessment sheets outline the key learning points for the end of each unit and judgements are made as to whether children have achieved the expected standard for each key learning point. This data is collated and interpreted using 'Insight'. Actions are identified for individuals and key groups in order to raise attainment where appropriate.

Monitoring & Training

- The science subject leader attends regular training provided by Gloucestershire LA, which share up-to-date information and good practice. Information is fed back to school staff and actions carried out as a result of the training.
- Regular lesson visits, pupil conferences, staff conferences and book audits are carried out, led by the science subject leader, and actions identified to ensure that science standards remain consistently high.
- Annual moderation ensures progress is monitored within classes and year groups.
- Staff CPD opportunities are provided when needed. For example, Adfecto/STEM are delivering bespoke CPD for staff in the 2023-24 academic year on teaching and assessing science enquiry.

Extra-Curricular Opportunities in Science

Children love science learning at Leonard Stanley Primary School, so it is important for us to provide extra science learning opportunities for our children outside of the science lesson. We offer:

- An annual science week.
- A Key Stage 2 Science Club in Autumn Term, delivered by 'Fun Science'.
- A Key Stage 1 Science Club in Spring Term, delivered by the science subject leader.
- A science section within the school library.

Impact: *What will this look like? What will children be able to do before they leave our school?*

Children at Leonard Stanley Primary School will:

- Be able to retain and recall knowledge that is pertinent to science with a real-life context.
- Be able to question ideas and reflect on knowledge.

- Work collaboratively and practically to investigate and experiment.
- Be able to articulate their understanding of scientific concepts and be able to reason scientifically using rich language linked to science.
- Demonstrate a high love of mathematical skills through their work, organising, recording and interpreting their results.
- Achieve age-related expectations in science at the end of each academic year.
- Be ready for their next phase of education in science learning at secondary school by the time they leave Leonard Stanley Primary School.