Lister Primary School

Science Rationale

Lister Infant Science Rationale

"Together We Learn, Together We Grow"

Our school motto is at the core of what makes Lister Primary School unique. We are an inclusive school where children are at the heart of everything we do. It is a place where everyone feels like they belong and are supported. We are a family.

Our Vision is:

- To provide a safe, happy, caring and inclusive school where **ALL** are encouraged to succeed academically, socially and emotionally.
- ALL are treated with respect and kindness.
- To create an environment which promotes a genuine love of learning and empowers ALL to become independent, learners for life.

Our Core Values

We promote and teach four core values to our pupils that will ensure they develop the skills to be good citizens in the future. It is our values that determine our thinking and our behaviour. They are the principles, standards of life stances that act as guides to our behaviour.

Intent

The Staff and Governors of Lister Primary School aim to offer a stimulating curriculum and environment that allows all pupils to fulfil their potential regardless of race, creed, gender or ability and to develop a sense of their own worth and respect for others. We aim to support our pupils in becoming independent, resilient, lifelong learners with a positive attitude to school and life.

Lister Primary School teaches a Science curriculum based on the 2014 National Curriculum for primary schools. We have worked hard to develop our own curriculum model and methods for teaching this important subject to suit the needs of our children. Science is coherently planned and sequenced towards sufficient knowledge, understanding and skills for future learning in a range of scientific contexts.

Our Science curriculum is designed to develop children's curiosity and fascination about the world that will remain with them for the rest of their lives. The Science curriculum aims to give all children a strong understanding of the world around them whilst acquiring specific skills and

knowledge to help them to think scientifically, to gain an understanding of scientific processes and also an understanding of the uses and implications of Science, today and for the future.

At Lister Primary School scientific enquiry skills are embedded in each topic the children study and these topics are revisited and developed throughout their time at school. This model allows children to build upon their prior knowledge and increases their enthusiasm for the topics whilst embedding this procedural knowledge into the long-term memory. All children are encouraged to develop and use a range of skills including observations, planning and investigations, as well as being encouraged to question the world around them and become independent learners in exploring possible answers for their scientific based questions. Specialist vocabulary for topics is taught and built up, and effective questioning to communicate ideas is encouraged. Concepts taught are reinforced by focusing on the key features of scientific enquiry, so that pupils learn to use a variety of approaches to answer relevant scientific questions

At Lister Primary School we aim to provide a culturally rich curriculum through exposure to a range of science related experiences, including investigations and experiments, workshops and assemblies, also working in collaboration with local schools to enhance our science curriculum. We use curriculum enrichment opportunities to enhance our children's learning experiences with educational visits and visitors who provide our pupils with workshops and opportunities to enhance their science skills and knowledge. Lister Primary School have a range of educational visitors, for example, Mad Science, Warburton's, Knowsley Safari Park, Acorn Farm, and visits from health experts. Some of our science related visits, for example, have been to the local recycling centre, the local supermarket and Chester Zoo.

Key Drivers:

- To provide an exciting and engaging Science curriculum that is accessible to all pupils.
- To ensure there is breadth, depth and progression in teaching and learning across the Science curriculum, within and across year groups to increase pupil's knowledge, skills and understanding.
- To have high expectations of all our pupils by providing challenge.
- To encourage our children to persevere and aspire to be their best.
- To develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics.
- To 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.
- To equip pupils with the scientific skills required to understand the uses and implications of science, today and for the future. We understand that it is important for lessons to have a skills-based focus, and that the knowledge can be taught through this.
- To provide a culturally rich Science curriculum, relevant to our children so they have a breadth of experience.
- To expose our children to a multitude of enrichment through trips, visitors, enhancements,

themed weeks and days to inspire our children and switch them on to learning and achieving.

Implementation

Our Science curriculum is carefully mapped out to ensure sequential teaching within and across year groups. All lessons are taught sequentially to ensure learning builds on prior knowledge and that learning is deepened in each lesson. Science teaching at Lister Primary School follows a carefully devised progression in knowledge, skills and understanding for the different taught areas with clear milestones for each year group to achieve. Clever repetition allows our children to master key learning over time. We ensure EYFS cover key learning to support the KS1 curriculum and provide the building blocks for transition into KS1. Taught concepts are revisited in different contexts to ensure learning is memorable. This ensures our pupils can make connections and make progress.

Through planning, we involve problem solving opportunities that allow children to find out for themselves. Children are encouraged to ask their own questions and be given opportunities to use their scientific skills and research to discover the answers. This curiosity is celebrated within the classroom. The Science curriculum is taught in blocks to gain depth in learning so children have time to gain a clear understanding of the taught unit. Cross curricular links are also made to other subjects to make connections and revise learning in different contexts.

Planning involves teachers creating engaging lessons, often involving high-quality resources to aid understanding of conceptual knowledge. Teachers use precise questioning in class to test conceptual knowledge and skills, and assess children regularly to identify those children with gaps in their learning, so that all children keep up. We build upon the learning and skill development of the previous years. As the children's knowledge and understanding increases, and they become more proficient in selecting, using scientific equipment, collating and interpreting results, they become increasingly confident in their growing ability to come to conclusions based on real evidence.

Working scientifically skills are embedded into lessons to ensure these skills are being developed throughout the children's school career and new vocabulary and challenging concepts are introduced through direct teaching. This is developed through the years, in-keeping with the topics.

Pre and post assessments are used at the beginning and end of each science topic. This enables the teachers to have a starting point to move the learning forward with lessons pitched appropriately. It also helps to identify gaps in learning and identifies areas were misconceptions need to be addressed. The post assessment enables the teachers to assess how much has been learnt and also clearly identify the progress made.

Children are offered a wide range of extra-curricular activities, visits, trips and visitors to complement and broaden the curriculum. These are purposeful and link with the knowledge being taught in class. Regular events, such as Science Week, and Science workshops for pupils and parents, provide broader provision and the acquisition and application of knowledge and skills.

Pupil's learning is also enhanced by providing a range of exciting, real life learning experiences from Nursery up to Year 2. Nursery, for example, have the real life experience of learning about farm animals with a visit to the school from Acorn Farm. Reception, have the experience of learning about safari animals with a visit from Knowsley Safari Park. Year One visit Newsham Park to support their learning about plants, animals and the seasons. Year Two observe the life cycle of butterflies by keeping their own live caterpillars and observing the stages of its metamorphosis. Our real life experiences enable our children to be excited about science and it develops a sense of awe and wonder amongst our pupils.

Our real life experiences also include exposing our children to a variety of careers in science. We have achieved this by inviting parents in to discuss their careers. The children have learnt about a range of roles including nurses, midwives, doctors, and audiologists. We have also had visits from student doctors who provided a Teddy Bears Hospital and from student dentists who taught the pupils the importance of looking after their teeth. Additionally, we have built strong links with local secondary schools. We have worked collaboratively with the science teachers from these schools and they have provided some very exciting scientific assemblies and workshops for our pupils.

At Lister Primary School we are also very enthusiastic to keep our pupils informed about science events taking place in the wider world. We are devoted to following relevant global events such as Tim Peake's mission to the International Space Station. This event was memorable for our pupils because Tim Peake was the first British astronaut from the European Space Agency to visit the International Space Station.

Through various workshops, trips and interactions with experts, children have the understanding that science has changed our lives and that it is vital to the world's future prosperity. Children learn the possibilities for careers in science as a result of our community links and connection with national agencies such as the STEM Association. Pupil voice is also used to further develop the Science curriculum, through questioning of pupil's views and attitudes to Science. This is to support the children's enjoyment of science and to motivate learners.

Our engagement with the local environment ensures that our children learn through varied and first hand experiences of the world around them. So much of science lends itself to outdoor learning and so we provide children with opportunities to experience this. Lister Primary School has wonderful outdoor facilities to enable a range of scientific topics to take place through outdoor learning from Nursery to Year Two.

The Science curriculum is further enhanced with the provision for each year group to have their own science area. This is a learning environment which is designed to encourage pupils to revise and consolidate their learning. This space is changed regularly to reflect the current science topic being taught. It is an area where independent learning and research can take place. This area contains a science display, fun scientific activities and challenges, non-fiction science books related to the science topic, and scientific vocabulary on display.

The pupils at Lister Primary School are also able to take part in the school's Science Club. This is an after school club which is open to pupils from Reception, Year One and Year Two. The aim of this club is to follow the children's scientific interests and provides investigations which are fun and engaging. At the end of each session, the children are given a handout of the investigation they have completed. This is to help them to continue their scientific learning and investigations with their family at home.

ICT is used in the Science curriculum and makes a distinctive contribution to the teaching and learning of science. It enables pupils to observe, record, measure and interpret results. It also enables pupils to work independently and to make connections to the wider world. ICT is used as a teaching tool to explore scientific concepts. The children are familiar with using a range of programs including Purple Mash and Explorify to enhance their development in science.

Inclusion

Our school is an inclusive school and in each class there are children with a range of additional needs including ADHD, Dyslexia, Speech and Language, ASD and moderate learning difficulties. Our school recognises that children, with these different needs, benefit from an adapted lesson to allow all children to be successful and access activities at a level appropriate to their skills and needs. Resources are used to cater to the needs of individuals and support provided by staff as necessary. Any pupils with special educational needs are identified and teachers ensure lessons are catered to suit every pupil's needs through adapting tasks, using resources and staff as necessary. We want all our pupils to apply what they know with increasing fluency and independence.

Family links

Parents have a considerable contribution to make to a child's success in school. They are strongly encouraged to be fully involved in their child's education. Parents are invited to termly open afternoons and Parent's Evenings to discuss their child's work and progress in all areas of the curriculum, including Science. Parents are also encouraged to participate in science workshops held at Lister Primary School. Parents enjoy participating in the workshops because they are able to be engaged in science activities with their child. Twitter is used as a medium to share all of our exciting science curriculum with our families. This is a way for families to see what the children have been learning in the classroom or through continuous provision and any visitors, trips or

enhancements. This is always well received by the parents who love to tweet comments and share any home learning with the school too.

Impact

We expect all pupils to make progress which we see as knowing more and remembering more of the intended curriculum over time. We encourage our children to aspire in science and expect the majority of our pupils to leave being able to achieve age related expectations in Science at the end of their cohort year. This is achieved by providing a fun, engaging, high-quality Science education, that provides children with the foundations for understanding the world. Our Science curriculum is designed to allow our pupils to develop the key attributes which are valued by our school. These include pupils being curious thinkers, inspired, independent and resilient learners.

During the Foundation Stage and KS1 teachers complete ongoing informal assessment to support the pupil's learning and development and identify the next steps in their learning. Opportunities include teacher observation, questioning, child discussions and oral feedback against the learning objective and assessment criteria for the lesson. Teachers share these next steps with pupils to support children in moving their learning on.

Assessment is key to driving pupil learning forwards and to ensure we cater to every child's needs by identifying the next steps in their learning journey. Feedback contributes to every child achieving the progress and attainment they are capable of.

Children are assessed by their class teacher at the end of each term and the data is logged onto the school system termly and used by the Science Lead, Assessment Coordinator and Senior Management team who track pupil progress. Year group staff meet with the school Senior Leadership Team to discuss pupils each term and identify those at risk of not meeting targets. Guidance is provided for teachers on how to implement support for pupils to ensure the gap is narrowed and that they catch up quickly.

At the end of each year, teachers complete summative assessments against EYFS and National Curriculum level descriptors. Teachers must make a judgement as to whether the child's learning and development is best described by: the description of the level of development expected at the end of the year (expected); not yet at the level of development expected at the end of the year (emerging); or beyond the level of development expected at the end of the year (exceeding). (See assessment policy for further details)

The school implements a termly programme of prioritised monitoring, review and evaluation which includes: book scrutiny, lesson observations were appropriate, pupil voice, and learning walks. The coordinator feeds back to the Senior Leadership Team each term by completing a termly report monitoring data for all children including specific groups. As a result of analysing data, actions are shared with staff and monitored by the co-ordinator. Additionally a learning walk takes place where lessons, books and pupil voice are triangulated to ensure high quality learning is happening.

At the end of each year, a subject action plan is devised, monitored throughout the year and reviewed at the end of the following year.

We ensure all staff receive regular CPD in order to provide the highest quality of education to our pupils. Staff who have attended CPD training feedback to other members of staff at staff meetings to ensure good practice is implemented by all. We also invite experts into school to lead whole staff training and the subject lead attends meetings throughout the year with the Local Authority.

Lister Primary School are also very proud to have awarded the Silver Primary Science Quality Mark. This is a prestigious award which recognises and promotes the quality and progress in Science leadership, curriculum development, and the teaching and learning of science at our school.