

## **St. Laurence C.E. Primary School Science Policy 2023**



**This policy outlines the teaching, organisation and management of the Science taught and learnt at St. Laurence's C. E. primary school. It reflects the school's values and ethos. The implementation of the policy is the responsibility of all the teaching staff.**

### **Intent**

Science is a fundamental part of everyday life and developing understanding in this area is essential for the future of our world. The Science curriculum fosters a healthy curiosity in children about our universe and promotes respect for the living and non-living. We believe science encompasses the acquisition of knowledge, concepts, skills and positive attitudes. Throughout the programmes of study, the children will acquire and develop substantive knowledge, as well as the application of practical scientific skills, these are built-on and developed throughout the children's time at the school so that they can apply their knowledge of science when using equipment, conducting experiments, building arguments and explaining concepts confidently and continue to ask questions and be curious about their surroundings.

#### ***The 2014 national curriculum for science aims to ensure that all pupils:***

- *develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics*
- *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*
- *are equipped 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*

**At the core of all we do are our three main values: creativity, trust and wisdom.**

**Creativity:** Science provides many opportunities for children to demonstrate their creativity. Children creatively investigate and challenge ideas, allowing their learning to follow its own path. Children develop critical thinking skills to generate their own questions about the world around them. When discussing science with the children at St Laurence's many say that scientists invent things and create new ideas. At St Laurence's we facilitate children's creative ideas about how and why things happen.

**Trust:** Trust is demonstrated in the working relationships that are created through teamwork, children are encouraged to discuss and share their ideas, each taking on a role within the group as part of their enquiry. Positive relationships and trust allow children's confidence to grow, trusting their own and others' ideas. Children have to trust and evaluate evidence.

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**Wisdom:** Whether it is the ethics behind certain medical treatments, the environmental impact of industry, or how government funding is allocated to scientific projects; moral decisions are an important aspect of science. Scientific discoveries and inventions need to be used responsibly, and decisions made based on evidence. We encourage children to be both open minded (generating a hypothesis) and critical (demanding evidence) and to use their understanding of the world around them in a positive manner.

## **Implementation**

### **EYFS**

Science at foundation stage is covered in the 'Understanding the World' area of the EYFS curriculum. It is incorporated in one of the four specific areas within 'Understanding the World' in which pupils develop the crucial knowledge, skills and understanding that helps them make sense of their world. It is introduced indirectly through activities that encourage every child to explore, problem solve, observe, predict, think, make decisions and talk about the world around them.

### **Key stage 1 and 2**

At the start of each unit children have a title page which displays the disciplinary concepts along with a list of substantive concepts and knowledge. These are linked to vocabulary. Disciplinary concepts are the concepts children need to collect, understand and evaluate scientific evidence. In science substantive knowledge involves concepts which form the underpinning structure of the subject, for example respiration, energy or the idea of a force.

<b><u>Disciplinary concepts:</u></b>	<b><u>Substantive Concepts:</u></b>
<ul style="list-style-type: none"><li>• Working scientifically</li><li>• Comparative and fair testing</li><li>• Asking relevant questions, hypothesising</li><li>• Making observations using scientific equipment and measuring.</li><li>• Identifying patterns and drawing conclusions</li></ul> <p>Collecting, classifying, recording and presenting data</p>	<ul style="list-style-type: none"><li>• <b>The Natural World</b> Habitat Reproduction Respiration Evolution Anatomy of the human body</li><li>• <b>Materials and their Properties</b> Changing state Separating materials</li><li>• <b>Forces and energy</b> Energy Idea of a force Light</li><li>• <b>Earth and Space</b> Gravity</li></ul>

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Teachers have high expectations for all children, and plan, resource and direct differentiated learning activities that give support and issue challenge for all. We use a variety of teaching and learning styles in science lessons and often links are made with other subjects, especially through topic work. Our principle aim is to develop children's knowledge, skills and understanding. Sometimes we do this through whole-class teaching but wherever possible we engage the children in enquiry-based research activity. We encourage the children to ask, as well as answer, a wide variety of scientific questions. As part of this process the children plan and carry out practical scientific investigations, using appropriate equipment and resources. They have the opportunity to compile and use a variety of data, such as statistics, graphs, pictures and photographs. They use ICT in science lessons where it enhances their learning. The children are encouraged to evaluate evidence and present their conclusions clearly and accurately. The children also have the opportunity to take part in science-based field trips and workshops from visiting speakers.

### **Impact**

The successful approach at St Laurence's results in a high quality, challenging and engaging science curriculum, which provides children with the foundations for understanding the world. Through trips, outside visitors and hands on learning, pupils understand the real-world context for science and the applications of accurate scientific investigation skills. Children understand the contribution that scientists have made through the ages, drawing on cross-curricular skills to appreciate the contributions made by those before them. Children at St Laurence's overwhelmingly enjoy science, and this results in motivated learners. Monitoring the impact of our science curriculum is organised in the following way.

- Through learning walks conducted by both the science leader and head teacher, with feedback given to members of staff.
  - Analysis of Key Stage 1 and Key Stage 2 SATS data by the science leader, in conjunction with other relevant members of staff.
  - Tracking children's scientific knowledge and understanding.
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- Book trawls targeted specifically at identifying progress in the 'working scientifically' skills.
  - Pupil questionnaires, looking at what pupils learning attitudes are towards science.

### **Assessment**

We assess children's work in science by making informal judgements as we observe them during lessons. Assessment is made by questioning the children and by marking the work which is recorded in their books against specific learning outcomes. Throughout each science unit the children complete retrieval tasks to recall key vocabulary and concepts to further embed their learning. At the end of each unit children will carry out a focussed assessment task to assess pupils' knowledge of the topic and their scientific enquiry skills, this can be used to inform judgements. Assessments are recorded for each unit of work on science assessment grids which are then collated by the science subject coordinator.

### **Cross curricular links**

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Teachers will seek to take advantage of opportunities to make cross-curricular links. They will plan for pupils to practise and apply the skills, knowledge and understanding acquired through science lessons to other areas of the curriculum:

- Sharing strong links with mathematics – taking measurements (length, time, mass, etc.), data handling and presenting data in tables and through the use of graphs and pie charts.
- ICT. We recognise the important role computing skills have to play in the development of scientific skills. We also recognise the importance of being computer literate. Computing skills are used where appropriate to enhance teaching and learning of science and to give all children the opportunity to use computing to research, collect, analyse and present scientific findings.
- Geography shares a ‘natural’ link with science and pupils should have every possible opportunity to explore the science present in and around their school environment.
- To bring in History children should have the opportunity to research and learn about famous scientists from history and how their achievements have changed or impacted upon our lives.

### **SMSC Development**

#### **Spiritual development:**

- Looking for meaning and purpose in natural and physical phenomena
- Wonder about what is special about life
- An awareness of the scale of living things from the small micro-organism to the largest
- The interdependence of all living things and materials of the Earth.
- Emotional drive to know more and to wonder about the world
- Wonder at the vastness of space and the beauty of natural objects

#### **Moral development:**

- Pupils to become increasingly curious
- Development of open mindedness to the suggestions of others
- Scientific developments may give rise to moral dilemmas
- Considering the environment

#### **Social development:**

- Group practical work
- Team working skills and to taking responsibility
- Taking responsibility for their own and other people’s safety

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- Understanding that science has a major effect on the quality of our lives
- Consider the benefits of scientific developments and the social responsibility involved

#### **Cultural development:**

- Scientific discoveries as a part of our culture
- Scientific discoveries of other cultures
- Scientific discoveries by a wide range of men and women in many different cultures
- Environmental issues are central to science

#### **Equal opportunities**

At St Laurence's CE Primary School, we are committed to providing all children with an equal entitlement to scientific activities and opportunities regardless of race, gender, culture or class.

#### **Inclusion**

We aim to meet the needs of all our children by differentiating in our science planning and providing a variety of approaches and tasks appropriate to ability levels, with achievable targets. All children must have regular access to science appropriate to their stage of development. Challenge for all is integral to our teaching and we aim to encourage all pupils to reach their full potential through the provision of varied opportunities. Work must be differentiated to aid children's learning.

#### **Gifted and talented**

More-able children should be given open-ended tasks and opportunities for further research and more challenging studies. We recognise that our curriculum planning must allow pupils to gain a progressively deeper understanding and competency as they move through our school.

#### **Resources**

There is a central science resource area within the PPA room in school. Resources are audited each year and all staff can request any resources that they may need to teach the science units taught within their year group. Where resources are shared between year groups staff have a resource box kept in their classroom.

#### **The Role of the Co-ordinator**

Responsibilities include:

- Ensuring the programme of study is employed effectively across key stages.
- Organising and maintaining resources.
- Supporting colleagues and identifying training needs.
- Keeping up to date with new initiatives and curriculum developments.
- Monitoring and evaluating the planning, teaching and delivery of science.
- Disseminating information through staff meetings and training days.
- Analysing data to inform teaching and planning.

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- Raising the profile of science within the school.

### **Health and Safety**

Pupils will be taught to use scientific equipment safely when using it during practical activities. Class teachers and teaching assistants will check equipment regularly and report any damage, taking defective equipment out of action. A simple risk assessment will be carried out for all practical activities; any perceived hazards will be reported to the Head who will determine the appropriateness of said activity.