

At St Teresa's Catholic Primary School our curriculum is driven by our mission *to create confident and independent learners who have the skills and knowledge needed to be the best that they can be and who serve each other in a loving Catholic community.*

### **Intent:**

At St Teresa's, we encourage children to be creative and inquisitive learners throughout their time at the school and beyond. 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.

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 St. Teresa's these skills are embedded within science lessons and developed consistently over time. Teachers have high expectations for all children to achieve and enjoy Science and to be able to use the skills they have acquired in a range of contexts. Throughout the programmes of study, the children will acquire and develop the key knowledge and vocabulary that has been identified within each unit and across each year group, as well as the application of scientific skills. We ensure that the 'Working Scientifically' skills are built-on and developed throughout the children's time at our school so that they can apply their knowledge of science when using equipment, conducting experiments and building arguments.

### **Implementation:**

Science learning takes place in a variety of ways at St Teresa's. Children are given the opportunity to develop knowledge, skills and an enquiring mind. This is done through formal lessons, group activities, individual work, school trips and experiments. Children are taught to think scientifically and ask questions. Problem solving activities and investigations are used to engage children in their learning.

The delivery of science teaching at St Teresa's places an emphasis on scientific investigations and practical activities where appropriate. Science is taught in weekly lessons and is also delivered through cross curricular links in other subjects where appropriate. Science lessons are differentiated

according to children's learning requirements. This ensures all groups of learners can access the curriculum and make progress in each session. Care is taken to ensure progression from the foundation stage and throughout key stages 1 and 2. We build upon the knowledge and skill development of the previous years.

'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.

## Planning

We use a variety of teaching and learning styles in science lessons; in line with the National Curriculum.

Our principal aim is to develop children's knowledge and understanding of the methods and implications of science. We encourage the children to ask, as well as answer, scientific questions. We use whole class teaching and group or individual tasks, in which children have the opportunity to engage in practical activities to develop their understanding of the nature and processes of science, though a range of different types of scientific enquiries. The children are provided with opportunities to work scientifically using approaches to answer scientific questions.

Teachers work in key stages to plan effectively; key stage 1 (Y1/2), lower key stage 2 (Y3/4) and an upper key stage two (Y5/6). These teams work together to ensure coverage and follow a long term plan. As we have mixed-age classes, we organise and teach our medium-term planning on a two-year rotation cycle. In this way, we ensure coverage of the National Curriculum, without repeating topics.

## The Foundation Stage

We teach science in our reception class as an integral part of the topic work covered during the year. As the reception class is part of the Foundation Stage of the National Curriculum, we relate the scientific aspects of the children's work to the objectives set out in the Early Learning Goals (ELGs) which underpin the curriculum planning for children aged three to five. Science makes a significant contribution to developing a child's knowledge and understanding of the world, e.g. through investigating what floats and what sinks when placed in water.

## Teaching and Learning:

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.

- Teachers ask a range of questions which enable all children to take part, listening carefully to answers and taking learning forward, using open and closed questions and allowing children time to think.
- 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 pupils regularly to identify those children with gaps in learning, so that all pupils keep up.
- New vocabulary and challenging concepts are introduced through direct teaching. This is developed through the years, in-keeping with the topics.

- Working Scientifically skills are embedded into lessons to ensure these skills are being developed throughout the children's school career. The key knowledge for each topic and across each year group is mapped across the school and checked at the end of each science topic.
- Teachers demonstrate how to use scientific equipment, and the various Working Scientifically skills in order to embed scientific understanding.

### Scientific knowledge and conceptual understanding

The programmes of study describe a sequence of knowledge and concepts. While it is important that pupils make progress, it is also vitally important that they develop secure understanding of each key block of knowledge and concepts in order to progress to the next stage. Children's starting points are identified at the beginning of each science topic and the children are able to convey and record what they know already. These points are then revisited at the end of the topic and the children record what they have learnt. Children should build up an extended specialist vocabulary and teachers ensure that this is developed within each lesson and throughout each science topic. The science curriculum ensures that children are provided with regular opportunities to apply their mathematical knowledge to their understanding of science, including collecting, presenting and analysing data.

### The nature, processes and methods of science

'Working scientifically' specifies the understanding of the nature, processes and methods of science for each key stage and this is embedded within lessons and focuses on the key features of scientific enquiry, so that pupils learn to use a variety of approaches to answer relevant scientific questions. These types of scientific enquiry include: observing over time; pattern seeking; identifying, classifying and grouping; comparative and fair testing (controlled investigations); and researching using secondary sources. Pupils are given opportunity to seek answers to questions through collecting, analysing and presenting data.

### EYFS

Play underpins the delivery of all the EYFS. In playing, children behave in different ways: sometimes within their play, they may describe and discuss what they are doing and sometimes they may be more reflective and quiet as they play. Within a secure and challenging environment with effective support, children can explore, develop and experiment as they play to help them make sense of the world. The Foundation Stage delivers science content through the 'Understanding of the World' strand of the EYFS curriculum. This involves guiding children to make sense of their physical world and their community through opportunities to explore, observe and find out about people, places, technology and the environment. They are assessed according to the ELG's of the EYFS curriculum.

### Key Stage 1

The principal focus of science teaching in key stage 1 is to enable pupils to experience and closely observe the natural and humanly-constructed world around them. They are encouraged to be curious and ask questions about what they notice. They are helped 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, noticing patterns, grouping and

classifying things, carrying out simple comparative tests, and finding things out using secondary sources of information. They begin to use simple scientific language to talk about what they have found out and communicate their ideas. Most of the learning about science should be done through the use of first-hand practical experiences, but there should also be some use of appropriate secondary sources, such as books, photographs and videos.

‘Working scientifically’ is described separately in the programme of study, but must always be taught through and clearly related to the teaching of substantive science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content.

Pupils should read and spell scientific vocabulary at a level consistent with their increasing word reading and spelling knowledge at key stage 1.

#### Lower Key Stage 2:

The principal focus of science teaching in lower key stage 2 is to enable pupils to broaden their scientific view of the world around them. They do this through exploring, talking about, testing and developing ideas about everyday phenomena and the relationships between living things and familiar environments, and by beginning to develop their ideas about functions, relationships and interactions. They ask their own questions about what they observe and make some decisions about which types of scientific enquiry are likely to be the best ways of answering them, including observing changes over time, noticing patterns, grouping and classifying things, carrying out simple comparative and fair tests and finding things out using secondary sources of information. They draw simple conclusions and use some scientific language, first, to talk about and, later, to write about what they have found out.

Pupils should read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge.

#### Upper Key Stage 2:

The principal focus of science teaching in upper key stage 2 is to enable pupils to develop a deeper understanding of a wide range of scientific ideas. They do this through exploring and talking about their ideas; asking their own questions about scientific phenomena; and analysing functions, relationships and interactions more systematically. In upper key stage 2, they encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. They also begin to recognise that scientific ideas change and develop over time. They select the most appropriate ways to answer science questions using different types of scientific enquiry, including observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests and finding things out using a wide range of secondary sources of information. Pupils draw conclusions based on their data and observations, use evidence to justify their ideas, and use their scientific knowledge and understanding to explain their findings.

Pupils should read, spell and pronounce scientific vocabulary correctly.

#### Curriculum Links

Science has many strong links with other subjects as well as constantly reinforcing children’s basic skills. It develops many of the skills used in literacy such as reading, writing, speaking and listening. Children enhance their mathematics skills by developing their ability to

problem solve, measure, and represent and analyse information. Children use ICT whenever appropriate in science lessons. This includes using laptops and cameras.

## Health and Safety

All children are made aware of the importance and relevance of health and safety when undertaking work in science. In planning, the class teacher is expected to assess the risks and adjust their lessons accordingly to ensure safe practice and appropriate levels of supervision. The CLEAPSS website is an excellent source of information and advice about minimizing risk in Science teaching.

## **Impact:**

St. Teresa's School has a supportive ethos and our approaches result in a fun, engaging, high-quality science education, that provides children with the foundations and knowledge for understanding the world.

## Assessment

Assessment for learning should occur throughout the entire science lesson, enabling teachers to adapt their teaching/input to meet the children's needs. This feedback should be incisive and regular.

At the start of each topic children identify what they know already about the topic. The programme of study is responsive to the children's starting points and it also ensures a focus on the key identified knowledge of each topic. At the end of each blocked science topic, this key knowledge is checked.

Assessment of pupil work and progress is on-going by the class teacher and informs future planning. Teachers use formative assessment against the KS1, LKS2 or UKS2 descriptors which allows teachers to assess children's progress in science, gathering evidence over the course of the year. Teachers use this information to inform planning for groups and individual pupils. Progress and attainment is reported to parents through parents' evenings and end of year reports.

