Holy Family Catholic Primary School

Science Policy

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Approved by:	SLT
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Mission Statement

Our mission statement at Holy Family Catholic Primary School is embedded by the statement of ethos:
'Learning together, playing together, praying together'
Holy Family School is a place that is committed to create challenging, stimulating and effective learning.
We know that God's love surrounds us and we are all valued, gifted and unique.

Intent

Our high-quality, knowledge-based science education at Holy Family Catholic Primary School aims to provide all learners with the foundations for understanding the world through the specific disciplines of biology, physics and chemistry, as well as develop a sense of excitement and curiosity about natural phenomena within every pupil.

Our curriculum aims to give purposeful learning opportunities that build on children's prior learning. Children should be taught through enquiry based learning, where they are given time to investigate, prove and justify theories and reasons.

Science links in with other school intents; working independently and collaboratively and trying new experiences.

Implementation

The teaching of Science at Holy Family Catholic Primary School focuses on expanding children's knowledge, encouraging them to ask questions, use and understand new vocabulary and acquire the scientific skills they need to carry out investigations safely by using the correct equipment. Scientific investigations are embedded throughout the topics of the ARK curriculum.

We provide our learners with a knowledge rich curriculum, focusing on developing the vocabulary and skills to understand and explore the world around them. Our children are 'Scientists' and enjoy exploring and discovering what is around them, hence providing them with a deeper understanding of the world they live in.

In Key stage 1, pupils begin their journey by exploring topics such as Everyday materials, these are then built on and knowledge is deepened when the topic is revisited in Key stage 2. Pupils are encouraged to self-assess and refer to knowledge previously learnt to ensure it is embedded.

All teachers are responsible for planning their own science lessons which cover the programs of study for the National Curriculum 2014 and Understanding the World in the Early Years. Science at Holy Family is delivered using the 'ARK Mastery Curriculum' once per week. A progression grid is in place to ensure that science is taught in a systematic and progressive way, as well as long term planning.

All classes have an interactive learning wall where science vocabulary, children's work and questions to further children's knowledge can be found. Information is also displayed and shared with children in the form of a knowledge organiser. These are to support children in learning current themes and objectives, whilst also reminding them of prior knowledge.

It is important that children develop the skills of a Scientist by fully immersing them in all areas of the subject. The local area is fully utilised to achieve desired outcomes, with opportunities for learning outside the classroom embedded in practise. School trips and fieldwork are provided to give first hand experiences, which enhance children's understanding of the world beyond their locality.

Impact

By the time the children at Holy Family leave our school they will:

- Have an extensive base of scientific knowledge and vocabulary.
- Children will achieve age related expectation in science for the end of their cohort year. This will be moderated and examples of WT, EXP and GDS will be shared.
- Gain a wider variety of skills linked to both scientific knowledge and understanding, and scientific enquiry/investigative skills.

- Have a richer vocabulary which will enable children to articulate their understanding of taught concepts applying this to everyday life.
- Have high aspirations, which will see them through to further study, work and a successful adult life.
- Have a general knowledge of biology, chemistry and physics which will allow them to make sense of the world around them. Hence enabling them to take on further learning and acquire new skills.
- Become 'scientists' with a love and understanding of science.

Planning and Organisation

Holy Family Curriculum is underpinned by the ARK Mastery Curriculum as the basis for our curriculum planning. Science is carefully sequenced and is a knowledge-rich, comprehensive curriculum that has been strategically sequenced to ensure a broad and effective learning experience for all pupils. Teachers use long term planning, developed by the Science leader, which informs medium term planning. Each unit of work is underpinned by a clear rationale and conceptual rigour including knowledge organisers and rich vocabulary is planned for across all year groups. Connections are meaningful, links between the subjects have been embedded to ensure children gain a rich understanding from a historical perspective. It provides full coverage of the National Curriculum and beyond, along with a balance between scientific knowledge and skills, thus providing opportunities for scientific investigations and wonder and awe about the world we live in.

At Holy Family, our whole school approach to the teaching and learning of science includes:

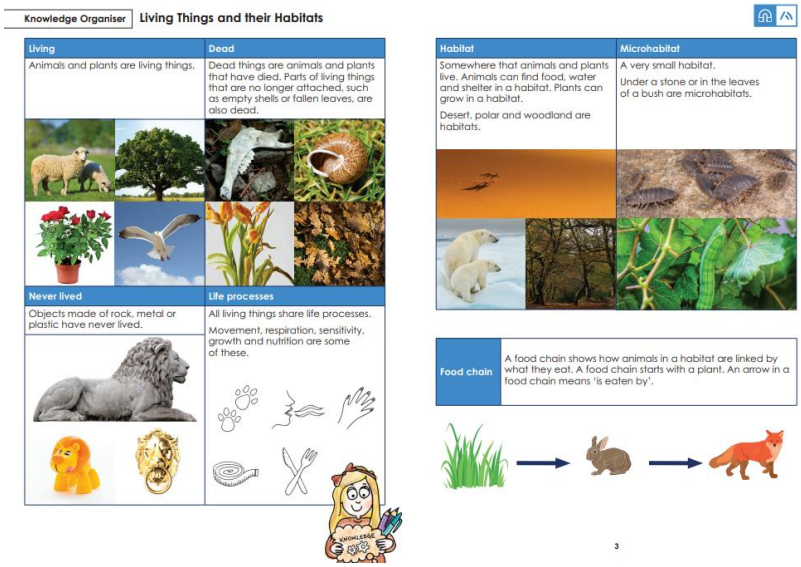
- Science taught in a planned cycle of lessons arranged in topic blocks in a sequence from Ark Curriculum. Planning involves teacher using Ark to create engaging lessons, involving resources and other resources to develop children's conceptual understanding.

We ensure that lessons have problem solving opportunities which allow children to find out for themselves. We consistently refer to prior learning and future learning 'the learning journey' thus improving children's working memory.

Children are encouraged to ask their own questions (encouraging this at the beginning of a topic and then providing children opportunity to revisit this at the end of a block of learning).

Teacher assessment is used regularly to identify those children with gaps in learning, so extra support and intervention can be given where needed. Weekly quizzes are used to recap previous learning and children answer our topic enquiry question at the end of each unit, presenting their learning in a style of their choice.

Science is taught once a week, but is also taught in many different contexts throughout all areas of the curriculum. For example, through English, i.e. writing a biography of a famous scientist's life. Teachers are encouraged to focus at least one writing genre, a school year, on a piece of scientific writing whether it be a write-up from an experiment, or a set of instructions on how to plant a seed, for example.



An example 'knowledge organiser' referred to as 'knowledge end points'.
Y2

Early Years Foundation Stage

Ways of teaching in Early Years can look a little different to those used in KS1 and 2. Many of the objectives are covered through play based activities and tasks, within the continuous provision both inside and outside and whole class teaching is rarely used. Assessment is done by observing the children in a range of different activities across the half term, term and year. Children in Nursery are expected to be at least 30-50 months secure by the end of the

year. Children in Reception are expected to achieve the ELG's for each area. As the objectives are from a variety of different areas of learning and the main bulk of learning ones are from the area 'Understanding the World', there is no separate assessment for Science. Please refer to the separate document produced by the Early Years leader for further details about how science is taught in Early Years and for more detailed planning of unit titles to be covered throughout the year.

Key Stage 1 and 2

As previously mentioned we use the ARK Mastery Curriculum+ for Science in Key Stage 1 and Key Stage 2 to ensure full coverage of the subject is taught. We ensure that there are opportunities for children of all abilities to develop their skills and knowledge in each unit. Opportunities for progression are planned for to ensure that children are increasingly challenged as they progress through the school.
Long term plans Our Long Term Plan for Science provides each year's long term objectives.
Medium term plans These are broken down into half termly, of termly units of work based on long term planning. Plans are reviewed on a regular basis.
Short term plans Weekly planning is used throughout the school from Y1 to Y6. Planning outlines the learning objectives, which are taken from the medium term plans. The Science team/Senior Management monitor planning, delivery of planning and the impact of this through the children's outcomes.

Long term plans

Our long term plan for science provides each year's long term objectives. The programme contains 5 units of work within each year group, covering a carefully considered balance of biology, physics and chemistry.

Medium term plans

Our detailed medium-term plans are drawn up by teachers in their year groups using the long term plans provided. This ensures coverage and progression of skills and knowledge throughout the school. The relevant programmes of study and specific learning objectives are stated on these plans.

Short term plans

Weekly planning is used throughout the school from Y1 to Y6. Planning outlines the learning objectives, which are taken from the medium term plans. The science leader monitors planning, delivery of planning and the impact of this through the children's outcomes.

Science and mathematics

Our science curriculum is designed to foster curiosity, critical thinking, and a deep understanding of the world, while making meaningful cross-curricular links with mathematics. Pupils are encouraged to apply mathematical skills within scientific contexts, such as measuring, recording, and analysing data, using standard units, and presenting results through charts, tables, and graphs. Through activities like investigations and experiments, children develop their ability to estimate, calculate, and interpret numerical information, strengthening their confidence in both subjects. This integrated approach ensures that mathematics is purposeful and relevant, supporting pupils in making connections across their learning and developing essential problem-solving skills.

Spiritual, moral, social and cultural development

Science teaching makes a valuable contribution to pupils' spiritual, moral, social and cultural (SMSC) development. Through exploring the natural world, pupils develop a sense of awe and wonder about scientific phenomena, encouraging reflection and curiosity. Moral development is supported as pupils consider the ethical implications of scientific advancements, such as environmental responsibility and the impact of human activity on the planet. Social skills are fostered through collaborative investigations, where pupils learn to communicate ideas, listen to others, and work respectfully as part of a team. Cultural development is enhanced by recognising the contributions of scientists from a wide range of backgrounds and understanding how science influences and is influenced by different societies and cultures.

SEND and Equal Opportunities

At Holy Family Catholic Primary school, we adapt and differentiate learning opportunities for children with SEND in science lessons through our SEND Toolkit. Differentiation is incorporated into the lessons in a variety of ways:

- Setting suitable learning challenges
- Responding to children's diverse learning needs

Interventions to enable inclusion may involve:

- grouping for teaching and learning purposes
- additional support
- differentiated use of resources

Science is incorporated into a wide range of cross-curricular subjects. In Science lessons, we ensure that EAL children are supported in a variety of ways e.g. emphasising key vocabulary and ensuring that the historical vocabulary is explained in a way that can be understood, providing teacher or teaching assistant support, speaking clearly, using resources such as visual images, artefacts and making links to previous experiences.

Recording of Children's Work

Children are encouraged to record their work using a variety of methods and therefore communicate their findings to others. These may include written or verbal reports, charts, models, data, graphs, observations and pictures. Examples of children's work will be retained to provide evidence of on-going science, including photographic evidence of displays, presentations and science based school visits.

Assessment

We assess children's work in science by making informal judgements as we observe them during each history lesson. As children complete a piece of work, the teacher live marks the work and verbally comments as necessary. Feedback relates to their attainment against the learning objectives for science. Marking is in line with the whole school marking and feedback policy

Formative assessment opportunities are provided through:

- live marking
- verbal feedback
- analysis of children's work
- questioning
- discussions
- quizzes
- Regular assessments of each child's progress using O Track

Summative Assessment

By using regular formative assessments, teachers are able to determine which objectives have been achieved and which will need revisiting. This information is then reported to parents annually. Teachers are expected to make regular assessments of each child's progress and to record these using O' track.

At the end of the year, the teacher makes an assessment of progress. This also enables the teacher to comment on the pupil's progress as part of the child's annual report to parents. We pass this information on to the next teacher at the end of the year.

Monitoring and reviewing

Monitoring of the standards of children's work and of the quality of teaching in science is the responsibility of the history subject leader. The work of the science subject leader also involves supporting colleagues in the teaching of science, being informed about current developments in the subject, and providing a strategic lead and direction for the subject in the school. The science subject leader gives SLT ongoing reports in which s/he evaluates the strengths and weaknesses in the subject and indicates areas for further improvement. The science subject leader has allocated time in which to fulfil this role by reviewing samples of children's work and visiting classes to observe teaching in the subject. Evidence is provided through:

• Work scrutiny

• Data analysis

• Review of planning

• Learning walks

• Pupil interviews

What does a Science lesson look like?

Each and every Science lesson should follow the same format:

- Begin with revisiting the learning journey so far, referring to the classroom display.
- A quiz will then form the 'starter' of the lesson allowing children to respond to previous learning.
- Each child will then have a key knowledge to stick in to their books informing them of the new vocabulary and learning which will take place in the lesson.
- Use ARK lessons to plan and deliver the lesson ensuring adequate resources are available for the children.
- Good use of questioning throughout the lesson with a 'ping pong' approach to teaching.
- Offer opportunities for children to reflect and discuss their learning as well as ask and answer questions to deepen their understanding.
- Ensure Tier two and Tier three words are on display and added to throughout the learning journey (usually new words will be added during the lesson) remember to also refer to previous words.
- Allow children some creativity in the way they present their work using a double page spread for each lesson.
- The plenary of the lesson will consist of children evaluating their learning and then discussing the context of the next lesson thus allowing children to research at home should they wish prior to the next lesson.

Greater Depth

In terms of planning for greater depth, the questions we need to ask ourselves is how do we extend children's learning when they have mastered the basic curriculum concepts.

The 3 key aspects of pupil's achievement:

- Competence in scientific enquiring; evaluating conclusions when working scientifically and exploring a concept with a greater degree of independence.
- Applying what they've learnt in one area of a subject to other areas.
- Deeper thinking, testing hypotheses and predictions and applying knowledge consistence, confidently and fluently.

Considerations when teaching with Greater Depth in mind:

- Having high expectations for all children. At Holy Family, teachers will present a concept to the whole class and then add in more complex ideas, questions and tasks as and when they see children being successful.
- We teach children how to reflect, explain, justify and question which are visible in each lesson. Children must be able to explain how they know they are right. Some children may need guidance to get there with careful questioning. A focus is on always using correct scientific vocabulary.
- Children are encouraged to apply learning in different ways around a similar topic. Where do we see this in the real world? Who do you know uses this type of science?
- Opportunities to collaborate, when children are in groups they have opportunities to generate endless lines of enquiry, able to question each other effectively and challenge ideas.

"Children who consistently work at greater depth are confidently able to deal with increases in the complexity of how a subject is presented"

Oracy in science

At Holy Family Catholic Primary School, we believe that oracy is a fundamental skill that enhances pupils' understanding and engagement in science. By developing speaking and listening skills, children can articulate scientific ideas, reason effectively, and collaborate in their learning.

Opportunities for oracy in science

- **Think-Pair-Share:** Pupils discuss their ideas with a partner before sharing with the class.

- **Talk Partners:** Regular opportunities for paired discussions on scientific topics.
- **Debates:** Engaging pupils in structured debates on scientific issues (e.g., climate change, space exploration).
- **Role-Playing:** Acting out scientific concepts (e.g., the water cycle, pollination).
- **Observations:** Children discuss the observations they have made and how their observations may change over time.

AI (Artificial intelligence)

At Holy Family, we are committed to delivering a high-quality primary science education that inspires curiosity and fosters a deep understanding of the world. To enhance our established science scheme of work, we integrate the use of Artificial Intelligence (AI) in ways that align with our curriculum goals and support both teachers and learners.

AI tools are employed to complement and enrich our lessons, offering adaptive learning experiences that cater to the varied needs of our pupils. By personalising content delivery, AI enables us to support individual learning paces and styles, ensuring every child has the opportunity to succeed. Virtual experiments and simulations are integrated to bring scientific concepts to life, allowing pupils to explore ideas in interactive and innovative ways that complement traditional hands-on activities, however practical elements of investigation are still part of our curriculum.

Teachers benefit from AI-driven insights that identify areas where students may require additional support, enabling targeted interventions while reducing administrative tasks such as grading. This allows educators to focus more on facilitating engaging and impactful science lessons.

By incorporating AI thoughtfully and purposefully, we aim to enrich our science curriculum while maintaining its integrity, ensuring our pupils develop the skills and understanding needed to become confident and curious learners. This approach supports our commitment to delivering a forward-thinking education that prepares pupils for a rapidly evolving world.

Arrangements for review

Policies are regularly updated/reviewed by staff and governors to ensure that all aspects of the Science policy aims are being met and that the standards of science are continuing to improve. This policy will be reviewed again by SLT and the Science Subject Leader by April 2027.