	St Elizabeth's Catholic Voluntary Academy **Science Policy**	Issued: February 2024 Review: September 2025

Our Mission Statement and Guiding Rationale

"Be like Jesus. Be your best. Be Safe. Be Caring."

St. Elizabeth's Catholic Academy is a caring, Catholic school community, where we celebrate that everyone is made in the image and likeness of God. Here, individuals are helped to achieve their full potential, through experiences and opportunities that nurture the whole person. These experiences include high-quality teaching and learning and a Science curriculum that allows children to learn and acquire the essential characteristics of scientists, develop a passion for science and discover its application in past, present and future technologies. Pupils are empowered to become caring individuals, capable of independent thought, through links to the world around us and the demands of religious commitment in everyday life.

Aims of the Policy

At St. Elizabeth's Catholic Academy, we are committed to high-quality teaching and learning in science to raise standards of achievement for all pupils. All staff and governors have been consulted in developing this policy, which summarises expectations and common working practices. The policy reflects what has been agreed in terms of approach and consistency and makes explicit the best practice in science to which the school aspires. It also reflects the aims and objectives of the school and supports its vision.

Learning is the purpose of the whole school and is a shared commitment. At St. Elizabeth's Catholic Academy, we recognise that education involves children, parents, staff, governors, the community, diocese, and the local authority, and that for optimum benefit all should work closely together to support the process of learning within science.

Working in partnership, we aim to:

- Provide a Christ-centred, supportive, positive, healthy, caring and safe environment, which has high expectations and values all members of the school community.
- Recognise the needs and aspirations of all individuals and provide opportunities for all pupils to make the best possible progress, attain the highest personal achievements and enable them to be their best and fulfil their potential.
- Ensure children can develop the ability to think independently and raise questions about working scientifically and the knowledge and skills that it brings.

- Provide rich and varied contexts and experiences for pupils to acquire, develop and apply a broad range of knowledge, skills and understanding.
- Provide a curriculum which promotes the spiritual, moral, social, cultural, physical, mental and emotional development of the pupils.
- Develop individuals with excellent scientific knowledge and understanding which is demonstrated in written and verbal explanations, solving challenging problems and reporting scientific findings.
- Encourage all children to be enthusiastic and committed learners, promoting their self - esteem, self-worth and emotional well-being.
- Develop children's confidence and capacity to learn and work independently and collaboratively.

Science Curriculum Intent Statement

We aim for children to have acquired the essential characteristics of scientists:

- The ability to think independently and raise questions about working scientifically and the knowledge and skills that it brings.
- Confidence and competence in the full range of practical skills, taking the initiative in, for example, planning and carrying out scientific investigations.
- Excellent scientific knowledge and understanding which is demonstrated in written and verbal explanations, solving challenging problems and reporting scientific findings.
- High levels of originality, imagination or innovation in the application of skills.
- The ability to undertake practical work in a variety of contexts, including fieldwork.
- A passion for science and its application in past, present and future technologies.

We believe Science is crucial in terms of the children learning the essential skills they need to be resilient leaders. We believe in a hands-on teaching and learning approach that encapsulates the spirit of what Science is all about, so that the children will forever be 'Scientists' in the way that they interact with the world around them. Our science curriculum reflects this, through our mixture of theory and working scientifically; topics are planned in such a way that pupils are taught key substantive knowledge first so that they can then apply this when working scientifically. The thoughts and opinions of our children is of great importance when planning the curriculum and learning experience and this approach of theory and hands-on learning is what excites and enthuses them.

Science Curriculum Intent Model

1. Curriculum drivers shape our curriculum breadth in science. They are derived from an exploration of the backgrounds of our students, our beliefs about high quality education and our values. They are used to ensure we give our students appropriate and ambitious curriculum opportunities. Our curriculum drivers are community, spirituality, culture, democracy and possibilities.
2. Cultural capital gives our students the vital background knowledge required to be informed and thoughtful members of our community who understand and believe in British values.
3. Curriculum breadth is shaped by our curriculum drivers, cultural capital, subject topics and our ambition for students to study the best of what has been thought and said by many generations of academics and scholars.
4. Our curriculum distinguishes between subject topics and 'Curriculum Themes'. Subject topics are the specific aspects of subjects that are studied.
5. Curriculum Themes tie together the subject topics into meaningful schema. The same concepts are explored in a wide breadth of topics. Students return to the same concepts over and over and gradually build understanding of them. In science, our curriculum themes are: **Working Scientifically**, **Biology**, **Chemistry** and **Physics**.
6. Golden Threads: These 'Golden Threads' help students to relate each topic to previously studied topics and to form strong, meaningful schema. In Science these are ***Living Things, Evolution and Inheritance, Properties of Materials, Forces, Light and Sound, Electricity and Earth and Space.***
7. Cognitive science tells us that working memory is limited and that cognitive load is too high if students are rushed through content. This limits the acquisition of long-term memory. Cognitive science also tells us that in order for students to become creative thinkers, or have a greater depth of understanding they must first master the basics, which takes time.
8. Progression: For each of the Curriculum Themes, learning is planned by year group, each of which includes the procedural knowledge and Golden Threads in each Topic, giving students a way of expressing their understanding of the Curriculum Themes.
9. Cognitive Domains: Within each year group, students gradually progress in their procedural fluency and semantic strength through three cognitive domains: remembering, knowing and reasoning. The goal for students is to display sustained mastery at the 'knowing' stage of understanding by the end of each phase (Key Stage 1, Lower Key Stage 2 and Upper Key Stage 2) and for the most able to have a greater depth of understanding at the 'reasoning' stage.
10. Pedagogical Content Knowledge and Strategies: As part of our progression model, we use a different pedagogical style in each of the cognitive domains of remembering, knowing and reasoning. This is based on the research of Sweller, Kirschner and Rosenshine who argue to direct instruction in the early stages of learning and discovery-based approaches later. We use direct instruction in the remembering domain and problem-based discovery in the reasoning domain. This is called the reversal effect.
11. Our curriculum design is based on evidence from cognitive science; three main principles underpin it:
    - Learning is most effective with spaced repetition.
    - Retrieval of previously learned content is frequent and regular, which increases both storage and retrieval strength.
    - By revisiting Golden Threads, pupils are able to build a strong schema, and

develop skills as a Scientist.

12. In addition to the three principles, we also understand that learning is invisible in the short-term and that sustained mastery takes time.
13. Our content is subject specific. We make intra-curricular links to strengthen schema.
14. Continuous provision, in the form of daily routines, replaces the teaching of some aspects of the curriculum and, in other cases, provides retrieval practice for previously learned content.

Science Curriculum Impact

Because learning is a change to long-term memory, it is impossible to see impact in the short term. We use probabilistic assessment based on deliberate practice. This means we observe the practices taking place to determine whether they are appropriate, related to our goals and likely to produce results in the long term.

We assess understanding of the composite knowledge using the children's work in books, their contributions to discussions and through revisits away from the point of learning.

Assessment is recorded on INSIGHT, where teachers make a 1-4 judgement (in line with the Assessment and Feedback policy and Trust Assessment Framework) at three points during the academic year.

Lesson observations, learning walks, book scrutiny and pupils voice activities are used to support the moderation of children's work and assessment data. This supports leaders to monitor pedagogical choices match expectations for curriculum breadth and depth.

Science Subject Leader

The Subject leader has a variety of roles. These include:

- Taking the lead in policy development
- Quality assuring Science knowledge organisers, resources and planning throughout the school.
- Supporting colleagues in their development and implementation of science knowledge organisers, resources and planning, and in assessment and record-keeping activities.
- Monitoring progress in science and advising the Senior Leadership Team on action required.
- Taking responsibility for the purchase and organisation of central resources for teaching and learning in science.
- Using non-contact time to support colleagues.
- Keeping up-to-date through research and continuing professional development.

Organisation

The learning environment in science will be managed in such a way as to facilitate different styles of learning. Opportunities will be made for:

- Whole class teaching
- Group work, organised according to appropriate criteria (i.e. attainment, mixed attainment, friendship, etc)
- One-to-one teaching
- Conferencing
- Collaborative learning in pairs or groups
- Independent learning

All areas of the learning environment will be planned for, including, where appropriate, the outside areas, in order to ensure opportunities for a range of activities, which will develop appropriate knowledge, skills and understanding.

The classroom will be organised to facilitate learning and the development of independence. For example:

- Resources are made available for the study of science and to promote further interest.
- Labels and posters should be used wherever possible/appropriate and reflect the inclusive nature of the school.
- Children will be involved in the maintenance and care of all Science equipment and resources.
- Classrooms provide a stimulating and purposeful learning environment, including thought-provoking and stimulating displays to include children's work, tier three vocabulary and helpful resources that document the learning journey through science in the class.

Adaptations and Scaffolding

So that we always have the highest possible expectations of individual learners and so they can demonstrate what they can do, understand and achieve, teachers will adapt the curriculum according to individual needs through:

- Pace
- Challenge
- Mastery
- Content
- Task
- Relevance
- Resources
- Extension
- Autonomy
- Teacher/adult support

Adapted tasks will be detailed in planning and evident within lessons. All groups of pupils have access to quality-first teaching, through the five key principles:

- Flexible grouping
- Cognitive and metacognitive strategies
- Explicit instruction
- Using technology to support
- Scaffolding

Extra support is given in the classroom by teaching assistants. Additionally, advice is sought from relevant external support agencies when and where the need demands it. (See Special Educational Needs Policy)

Assessment, Recording and Reporting

Regular formative assessments are made of pupils' work and responses in science in order to establish the level of attainment and progress and to inform future planning. Formative assessment is used to guide the progress of individual pupils. It involves identifying each child's progress in each area of the curriculum, determining what each child has learned and what should be the next stage in his/her learning. Live marking and feedback is given in all Science lessons and feedback sessions are used to review the previous lesson's learning. Pupils respond to feedback and address misconceptions using purple pen. All results and information from assessments are analysed and used to inform future planning. (See Assessment, Marking and Feedback Policy)