

# Science Curriculum Intent, Implementation and Impact 2022-2023



## Intent

The intent is to create a curriculum that is based on real life experiences encouraging children to ask big questions about their world. That they learn to grow as artists, historians, musicians, designers, coders, scientists, writers, readers, mathematicians...and flourish as lifelong creative thinkers. The curriculum serves the needs of the children, building courage, compassion and independence to be a champion for what they believe in. They are courageous advocates for themselves and others in the local and global community. Children are born scientists having a natural curiosity about the world around them and a passion for exploration and discovery. At Canon Pyon CE Academy we endeavour to nurture the scientist in each child by providing opportunities to use scientific knowledge, investigation and discovery to help them make sense of the world around them. Understanding the process of investigative Science enables our children to believe they can make a lifelong difference in the world they live in.

### What Science looks like in our School:

Aspiring scientists with a sense of scientific awe and wonder

- Inspiring, challenging and investigative cross-curricular and discrete lessons
- Opportunities to explore and experiment with children planning, carrying out, recording and concluding

Opportunities for children to talk about their discoveries

- Development of their understanding of the world and natural phenomena
- Lessons that reflect scientific knowledge of biology, chemistry and physics
- Exciting and creative investigations working indoors and outdoors using a range of equipment
- Children who are becoming proficient in using science and scientific vocabulary to explain what is occurring, predict how things will behave and analyse causes.
- Learning about the achievements of famous key scientists past and present

### By the end of EYFS pupils will:

In Reception science is an integral part of the topic work covered during the year. We follow the objectives set out in the Early Years Foundation Stage Framework which underpin the curriculum planning for children aged three to five. Knowledge and Understanding of the World contributes to a child's personal and social development, and allows the child to explore and make sense of the world around them, developing curiosity, investigation and questioning.

### By the end of Key Stage 1:

Explore knowledge of plants, animals including humans, everyday materials and their uses, sound, earth and space, seasonal changes and living things and habitats.

### By working scientifically in each of the above content areas they will have developed their skills to:

- ask simple questions and recognising that they can be answered in different ways
- observe closely, using simple equipment

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- perform simple tests
- identify and classify
- use their observations and ideas to suggest answers to questions
- gather and record data to help in answering questions

## By the end of Lower Key Stage 2:

Explore knowledge of plants, animals including humans, Rocks, Light, Forces and Magnets, States of Matter, Sound and Electricity.

## By working scientifically in each of the above content areas they will have developed their skills to:

- ask relevant questions and using different types of scientific enquiries to answer them
- set up simple practical enquiries, comparative and fair tests
- make systematic and careful observations and, where appropriate, take accurate measurements using standard units, use a range of equipment, including thermometers and data loggers
- gather, record, classify and present data in a variety of ways to help in answering questions
- record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
- use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
- identify differences, similarities or changes related to simple scientific ideas and processes
- use straightforward scientific evidence to answer questions or to support their findings

## By the end of Upper Key Stage 2:

Explore knowledge of plants, animals including humans, Living things and their habitats, properties and changes of materials, Earth and Space, Forces, Evolution and Inheritance, Light and Electricity

## By working scientifically in each of the above content areas they will have developed their skills to:

- plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
- record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
- use test results to make predictions to set up further comparative and fair tests
- report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations
- identify scientific evidence that has been used to support or refute ideas or arguments

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## Implementation

### **This is how it works:**

Weekly lesson provided through cross curricular or discrete lessons

- Clear progression of skills developed throughout school
- Progression of knowledge developed each year
- Children will have had many opportunities to work scientifically both indoors and outdoors
- Opportunities to work with scientists from the community and beyond
- Workshops and science days or science week which develop children's sense of scientific wonder and interest

### **This is what adults do:**

- Teachers and phase teams work collaboratively to support each other in the teaching of science, understanding and applying current developments in the subject, and providing direction for the subject in the school.
- Curriculum leader evaluates the strengths and weaknesses in the subject and indicate areas for further improvement.
- Create a positive learning environment to encourage curiosity, questioning, investigation and discussion Engage in appropriate professional development and continue a professional dialogue about science teaching

### **This is how we support, challenge and ensure all children can access the curriculum:**

Our Christian vision challenges all subject leaders to reflect on ensuring that the English curriculum helps all pupils to belong and access learning, appropriate to their needs and abilities. Inclusion and *belonging* is a thread that runs through every area of the school enhanced by collaboration between senior leaders, subject leaders, the SENCO, class teachers, support staff, external agencies, parents and most importantly, the child. At Canon Pyon Church of England Academy, every teacher is a teacher of SEND and every leader is a leader of SEND.

Special Educational Needs and Disability (SEND)- Including the Lowest 20% of Learners

We firmly believe that *Quality First Teaching* is the solid foundation on which effective SEND provision is built. The first step to children having access to a broad and balanced English curriculum is through appropriate differentiation by skilled and nurturing teaching staff, who have ambitious expectations of their own teaching and students' learning. Differentiation is not a simply case of providing different worksheets, for example. Differentiation is adapting the work, success criteria or support given to help children achieve or make progress.

Differentiation- or adaptations- may include:

- Alternative tasks

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- Different objectives or goals within a task
- Resources or learning aids
- Amount of adult support within a task
- Frequency of monitoring within a session
- Time given to complete tasks
- Style of language used
- Style of questioning used
- Use of peer support
- Classroom organisation and grouping
- Level or style of feedback given



Differentiation takes many forms to help learners to *belong* within lessons, *believe* in their ability and *behave* in a way that applies their skills. Further support to help inclusion and overall pupil progress in this subject area may include:

- Targeted intervention programmes, which have a proven and measurable impact on progress.
- Have specific 1:1 or small group intervention, including support from Learning Mentor
- Celebration of achievement, as well as attainment
- Time given, as appropriate, to any emotional or behavioural support that may-in turn- be barriers to learning in this subject area
- Monitor pupil attitudes to subject and using pupil voice to ensure that learners have ownership of subject area/tasks
- Specific enrichment activities, visits or events planned/attended in order to suit the needs and interests of specific groups of learners
- Pupil progress meetings, involving the pupil(s) and any relevant adults
- Data analysis, whether this is quantitative performance data from tests, for example, or qualitative data from questionnaires or monitoring observations
- The provision of good quality and relevant training for all staff members.

Other Pupil Groups- Including More Able and Talented (MAT) and the Highest 20% of Learners

We believe that all children have individual gifts, interests and talents. Some children may exhibit a skill that is advanced in comparison to their peers. As a result, such pupils will require a higher level of challenge in order for them to *belong*, be included within English sessions and have their needs met. More able and talented pupils (MAT) will also receive differentiation and support appropriate to their needs.

Adapting tasks and providing opportunities to help all children to achieve well will also depend on the diversity of the groups of learners that are represented at Canon Pyon Church of England Academy.

Groupings of learners that could identify trends, spikes or dips in overall progress may include:

- Forces children
- Gender
- Behavioural needs

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- Children with emotional needs
- EAL children
- Age (i.e summer born)
- Attendance
- Family support
- LAC
- Ethnicity
- Those experiencing tragedy or loss
- Low self-esteem

This list is not exhaustive and neither are the methods mentioned in how learners can be catered for in this subject area. We are a listening school and are constantly reflecting on feedback from adults and children, with the constant goal of helping all learners.

## *Impact*

### **This is what you might typically see:**

- Happy and engaged learners
- Children demonstrating transferable skills, knowledge and expertise
- Lessons which are, creative and fun fostering a love of learning
- Children demonstrating a rich vocabulary
- Curious children who ask questions and take part in discussions
- Children who understand the importance of making mistakes and persevering to work through problems
- Confident children who are willing to persevere

### **This is how we know how well our children are doing:**

- Informal judgements based on observation during lessons.
- End of term assessments
- Pupil Voice
- Annual assessments in line with the National Curriculum in England 2014
- Summative assessment discussed during transition meeting with next class teacher

### **This is how Science contributes to the spiritual, moral, social and cultural development of the child:**

Within Science lessons children are given the opportunity to foster and indulge in their curiosity of the world. They discuss science and scientists looking at their impact upon our modern world, debating the rights and wrongs of these discoveries.

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### **Cultural Capital:**

Through our teaching of Science children are learning about the world around them and building a sense of their place within it. Through investigative science children learn about our own environment and how to look after it and learn to question how science has shaped the world. They learn about scientists and their work and understand how scientist's discoveries shape our future. Additionally they learn how to look after themselves and keep themselves safe, healthy and fit.

### **This is the impact of the teaching:**

As a result of the delivery of our Science curriculum at Canon Pyon CE Academy you would typically see confident, and engaged children who talk about themselves as scientists, talk enthusiastically about the subject and reflect on their learning. Children will be working in groups, pairs and independently demonstrating that they are self-motivated, resilient, curious and able to discuss what they have discovered. Children can confidently refer to how they have worked scientifically, what this means and why they use these skills as scientists. Examples of their work will be evidenced in topic and class books. Children are able to talk about the relevance and importance of science and the impact science has on the world around us.