XII Apostles RCPS

Science Policy

Curriculum Team 2

Policy written by Miss Phoenix

February 2024

To be reviewed:

Date Approved by the Governing body; _____
Signed (Chair):

(Headteacher):

Through learning and loving we will follow Jesus.

XII Apostles Science Policy

Our school Mission Statement:

'Through Learning and Loving we will follow Jesus'

Our school aims:

- To place Christ at the centre of everything we do.
- To recognise that each child is unique and to ensure that each child is educated to fulfil their human potential.
- To develop an understanding of Community; being able to recognise, respect and celebrate the diversity of all within it.

Statement of Intent:

The National Curriculum outlines the following aims for Science in primary schools:

- To develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics.
- To 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.
- To ensure all children are equipped with the scientific knowledge required to understand the uses and implications of Science, today and for the future.

In the National Curriculum, Science is broken down into two parts; scientific knowledge and conceptual understanding and the nature, processes and methods of science. We aim to use a wide range of contexts to maximise pupil's engagement and motivation in Science so that children make progress in each of these strands.

At Twelve Apostles, our aim is to provide children with a broad and balanced, engaging and interesting Science curriculum that ensures children are given the opportunity to fulfil their human potential as scientists.

Our Science curriculum intends to celebrate and recognise that each child is unique and to encourage children to be aspirational, have high expectations of themselves and to be ambitious for their future.

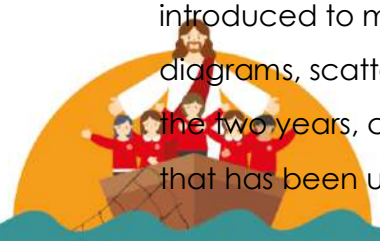
We want to develop children's scientific knowledge and conceptual understanding through giving them the opportunities to be biologists, chemists and physicians during their Science lessons. We look to equip children with the scientific knowledge and enquiry skills to help them answer questions about the world in preparation for the implication of Science today and for the future. We are committed to developing children's curiosity about the subject, as well as an appreciation of the possibilities and power of Science in the world around them.

Over the years, children develop many scientific enquiry skills:

In KS1, children are taught to use practical scientific methods, processes and skills to ensure they can ask simple questions and recognise that these questions can be answered in different ways. They should be shown how to observe closely, using simple equipment through practical experiences when performing simple tests. Over the two years, children will be taught how to identify and classify and will gather and record data using tables to help answer questions that are presented to them.

In Lower KS2, children are taught to use practical scientific methods, processes and skills to ensure they can ask relevant questions and use different types of scientific enquiries to answer them. Children will begin to plan for practical enquiries and comparative and fair tests, from which they will make systematic and careful observations, taking accurate measurements, using a range of equipment, including thermometers and data loggers. Children draw upon their Mathematics skills in a variety of ways. They are given opportunities to gather, record, classify and present data using bar charts, graphs and tables. They utilise their English skills when writing explanations, results and conclusions.

In Upper KS2, children are taught to use practical scientific methods, processes and skills to ensure they can plan different types of scientific enquires that answer their own questions. Children should begin to recognise and control variables and use equipment to take measurements with increasing accuracy and precision, including the use of repeat readings. When recording data and results, children are introduced to more complex methods of presenting data, including labelled diagrams, scatter graphs and classification keys to highlight causal relations. Over the two years, children will develop their skills when identifying scientific evidence that has been used to support or refute arguments.



Science Curriculum Aims;

- Deliver all requirements of The National Curriculum in relation to covering each scientific concept.
- Create a positive attitude towards Science in school.
- Ensure lessons are creative, purposeful, stimulating and well-informed through the use of appropriate scientific language and resources.
- Develop a sense of enjoyment and interest in Science.
- Instill an awe of the world around children by showing them the power of Science.
- Use children's natural curiosity as a foundation on which to develop children's questioning and enquiry skills.
- Provide children with a broad and balanced curriculum and thus the knowledge and skills to be chemists, biologists and physicians within their Science lessons.
- Ensure all children are equipped with the scientific knowledge required to understand the uses and implications of Science, today and for the future.
- Make children aware of the links between Science and other curriculum areas including English and Mathematics.
- Use a wide range of contexts to maximise pupil's engagement and motivation in Science so that children make good progress.
- Support children in developing their scientific enquiry skills including observing, investigating, hypothosising, identifying, classifying, gathering, recording and presenting data, measuring, concluding, evaluating and comparing.
- Enable children to make links to real life through the use of the wider community and outdoor environments.
- Ensure Science is accessible for all children, including those with SEND, to reinforce the expectation that all children are capable of achieving high standards in Science.
- To raise children's aspirations by researching scientists and allowing them the opportunity to understand the impact that Science has on the world.

Implementation

The content and principles underpinning the National Curriculum for Science and the Science curriculum at Twelve Apostles ensure that children develop a strong, conceptual understanding of scientific subject knowledge and scientific enquiry skills.

- Teachers reinforce an expectation that all children are capable of achieving high standards in Science.
- The large majority of children progress through the curriculum content at the same pace and aim towards their year group expectations.
- Learning is supported by carefully planned and sequenced lessons and specifically chosen resources to enable a deep conceptual and procedural knowledge.
- Each Science topic begins with a big question to stimulate children's curiosity and maximise pupil's engagement in their learning. They are given the opportunity to explore and research famous scientists and look at their role in the history of Science.
- Scientific vocabulary is key to enabling children to be scientists and investigate. Key vocabulary is planned for and explicitly taught so that children have the building blocks to explain their understanding.
- Play and practical exploration are key to developing a conceptual understanding in Science and in engaging children in enjoyment of Science.
- Progression of subject knowledge and skills is carefully monitored from session to session and year group to year group to ensure children achieve their full scientific potential.
- Teachers are given the freedom to find and use resources to plan for and teach exciting and stimulating Science lessons for children.
- The local community is used as a stimulus for scientific exploration. The environment surrounding the school is utilised by teachers to enable the children to investigate and observe the wonders of the world. For example, seasonal changes and animals and their habitats.
- Teachers use assessment for learning throughout the teaching cycle to identify conceptual and procedural knowledge. This assessment information is used to inform teaching and identify quickly those children who require additional support.
- Summative assessments are carried out at the end of each unit and children are assessed on both scientific subject knowledge as well as working scientifically skills.

- Through Science, children will draw upon their cross curricular skills such as reading and writing, computing skills as well as many mathematical skills such as data collection, analysis and presentation of results using tables and graphs.
- Children with SEND are supported through adaptation of resources, support and work.
- Periodically, KS2 are offered an extracurricular Science club, where they are given the opportunity to take part in exciting and engaging Science activities linked to the National Curriculum.

Impact

Our mission is clear; we aim to ensure that all children fulfil their human potential. We have a supportive ethos and our approaches support the children in developing their collaborative and independent skills, as well as empathy and the need to recognise the achievement of others.

Children can underperform in Science due to lack of confidence. The principles behind using play and practical experience enable all children to achieve. They ensure that all children experience challenge and success in Science by developing a growth mindset. Regular and ongoing assessment informs teaching to support and enable the success of each child. These factors ensure that we are able to maintain high standards, with achievement at the end of KS2.

Organisation, planning and teaching

Teachers follow the long-term plan (appendix 4) which shows the units that should be covered over the academic year, in line with the requirements of The National Curriculum. Each unit begins with a 'big question' to stimulate curiosity and provide a basis for which subject knowledge and scientific skills will be built upon throughout the teaching and learning of that topic. This allows cross-curricular links to be made and helps children to make links to real life situations.

When planning, teachers should refer to the long term mapping of subject knowledge (appendix 5) and long term mapping of working scientifically skills (appendix 6) to ensure full coverage of The National Curriculum objectives for their year group.

The long-term progression map (appendix 7) outlines the objectives, the subject knowledge, the skills and specific scientific language that teachers are expected to plan for and teach throughout each topic. Subject knowledge should be taught

and applied to practical investigations to develop children's working scientifically skills.

Where appropriate, teachers should introduce and allow time to research a range of scientists who have had an impact on today's society. This is with the aim of raising pupils' aspirations and giving children the opportunity to explore the power of Science in the world.

Science is to be taught weekly, with the exception of seasonal changes, which should be taught where appropriate to maximise children's learning experiences. Teachers should aim to cover a topic each half term with KS1 having four units and KS2 five.

All planning should be added to the shared server. Medium term plans should include the learning objectives to be covered, key vocabulary to be introduced, assessment opportunities and useful links and resources that will be referred to. Teachers are given the freedom to use their individual planning format providing these key elements are included. Medium term plans must be submitted half termly, before the unit is taught, whilst short term plans should be put onto the shared server weekly.

<u>Resources</u>

All resources for Science are kept in the allocated Science cupboards, which are located by the Year Three and Year Four cloakrooms. Science in school is well resourced and there is a wide range of equipment for children to use to ensure they are able to develop their working scientifically skills. If specific resources are required, these can be purchased or donated by parents.

Resources include:

- Human body models - including teeth and the digestive system
- Circuit equipment – batteries, crocodile clips, buzzers, motors and bulbs
- Earth and space models
- Materials to test
- Planting equipment
- Magnets
- Rocks
- Torches

If teaching staff find that there is a lack of resources, they must inform Curriculum Team 2 who will ensure these items are accounted for in the next annual budget.

Cross-curricular links

Where possible we teach using a cross-curricular approach to make learning meaningful for the children and to give children the opportunity, through Science, to draw upon cross curricular skills such as speaking and listening when describing what is happening and writing when planning and recording observations. Children also have the opportunity to develop their computing skills as well as many mathematical skills such as measurement, data collection, analysis and presentation of results using tables and graphs. Additionally, Science lends itself the PSHE curriculum where children learn about their health education including growth, teeth and life cycles.

Assessment and reporting

Teachers regularly assess children's progress in Science through observations, verbal discussions and evidence of tasks in books. Assessment is broken down into formative assessments and summative assessments.

Formative assessment:

Formative assessments are carried out during and immediately after short tasks and activities. This is done through the use observing and questioning to gain a clearer understanding of children's ideas, quizzes at the end of a lesson or explanation and short tasks, with all formative data recorded on science formative assessment grids. These provide teachers with the opportunity to reflect on teaching and children the opportunity to reflect upon their learning in relation to the success criteria. Formative assessments allow teachers to address any formed misconceptions and bridge any gaps in learning before moving on. They also inform planning, future lessons and interventions where required. Teachers regularly provide verbal feedback to children during lessons and after marking work to identify the next steps. Photographs are taken during practical investigations to record evidence of working scientifically.

Summative assessment:

Summative assessments should be recorded for all children to review children's progress and attainment. Summative assessments are used to inform future planning,

measure progress and provide a basis of communication with SLT, future teachers and parents.

In Science, children's knowledge is summatively assessed at the end of each topic, through the use of end of topic assessment tests, to identify gaps in learning and misconceptions. This data is recorded in the class assessment file in the form of a grid (appendix 1) to show whether children are working at greater depth, are secure, are working within or working below the year group objectives.

Working scientifically skills are assessed through the use of observation and questioning during and immediately after a lesson.

Science data is recorded at two points within the academic year – mid year and end of year – in the form of an excel tracker (appendix 2) which indicates the year group objectives that children have achieved.

All assessments, both formative and summative, inform the mid-year and end of year trackers.

Inclusion

Science is planned for according to the individual needs of the children - in line with the whole school policy surrounding equal opportunities and based upon our school aim to recognise that each child is unique. There are many ways in which SEND children can access the science curriculum including:

- Ensuring familiarity with scientific equipment
- The use of small steps during practical tasks
- Adaptive teaching tasks that meet the needs of pupils
- Additional adult support to ensure the development of working scientifically skills
- Suitable resources that support learning and allow full participation in experiments

For children who are gifted and talented or are working at greater depth, teachers must extend their scientific thinking through application tasks such as problem solving and research of a scientific nature.

Parental involvement

At Twelve Apostles, parents are encouraged to get involved with whole school science events and homework projects that children are given over the holidays.

Subject Leadership Roles and responsibilities

The SLT and Governing body are responsible for approving and monitoring this policy

Curriculum Team 2 responsibility:

1. Providing strategic leadership and direction for your subject
2. Producing LTP
3. Reporting termly to Governors on standards in your subject
4. Supporting and offering advice to colleagues on issues relating to the subject or curriculum area
5. Monitoring pupil progress in your subject and report to SLT
6. Providing efficient resource management
7. Ensuring the curriculum is inclusive and accessible to all
8. Assisting teachers with the planning and implementation of the curriculum, ensuring their workload is manageable
9. Ensuring the curriculum is implemented consistently throughout the school and ensuring any difficulties are addressed and mitigated as soon as possible
10. Making any necessary adjustments to the curriculum where required
11. Keeping up-to-date with any relevant statutory updates and taking action where required
12. Creating and maintaining an up-to-date curriculum intent statement
13. Ensuring the curriculum is created in accordance with this policy
14. Updating and maintaining this policy

Monitoring and evaluation

Science is monitored by the Curriculum Team 2 throughout the year and is carried out through:

- Lesson observations
- Planning scruitnies
- Book scrutinies
- Pupil interviews
- Learning walks (including the monitoring of working walls)
- Analysis of end of topic, mid-year and end of year data
- Observations by SLT

After monitoring, evaluations are carried out and recorded using a set format (appendix 3).

Findings are shared with staff as appropriate and termly through curriculum reports and individual feedback from monitoring.

Legal Framework

This policy has due regard to all relevant statutory and good practice guidance including, but not limited to, the following:

1. The Education Act 2002
2. The Children Act 2004
3. The Equality Act 2010
4. DfE (2017) 'Special educational needs and disability code of practice: 0 to 25 years'
5. DfE (2013) 'The national curriculum in England'
6. DfE (2017) 'Statutory framework for the early years foundation stage'
7. Ofsted (2019) 'School inspection handbook'
8. DfE (2013) 'Science programmes of study: key stages 1 and 2'
9. DfE (2014) 'Statutory framework for the early years foundation stage'

This policy operates in conjunction with the following school policies:

Assessment Policy

Marking and Feedback Policy

Teaching and Learning Policy

Parent Code of Conduct

Behavioural Policy

Health and Safety Policy

Relationship and Sex Education Policy (Y5 & Y6)

Appendix 1

Assessment Grid

Appendix 2

Excel tracker

Appendix 3

On the pulse journal

Appendix 4

Long term curriculum mapping

Appendix 5

Knowledge: Progression document

Appendix 6

Skills: Progression Document

Appendix 7

LTP