

Holy Trinity Church of England Primary School

To be the best we can be: for God, for others and for ourselves



Science Policy

Policy to be reviewed as necessary within 3 years

Subject leader: P Shacklady

Agreed by Governors
Spring 2021

Due for Review
Spring 2024

Vision

At Holy Trinity Church of England Primary School, every child is recognised as a unique individual. We celebrate and welcome differences within our diverse school community, encouraging all to grow and flourish as precious children of God. Learning is centred around experiencing the joy of discovery. The ability to learn is underpinned by the teaching of basic skills, knowledge, concepts and values, with a vision to prepare our children to be life-long learners, rooted in our school motto: To be the best we can be: For God, for others and for ourselves.

Christian Values

Love

Hope

Forgiveness

Trust

Peace

Reverence

Justice

Purpose and Aims of Science

A high-quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Science has changed our lives and is vital to the world's future prosperity, and all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational knowledge and concepts, pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes. 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 knowledge required to understand the uses and implications of science, today and for the future.

Organisation of Teaching

The Science curriculum is carefully and coherently sequenced to enable our children to develop a growing knowledge of the themes outlined above. Pupils' knowledge builds towards clearly defined end points so everyone knows what we expect our pupils to achieve by the end of each topic, each year and each key stage. To meet the

educational needs of our school community we have selected the following core knowledge concepts as a focus for our teaching. These are explored in increasing depth as pupils move through the school.

In KS1 pupils should develop fundamental scientific skills, become increasingly competent and confident and access a broad range of opportunities to extend their basic understanding of the world through scientific exploration. They should be able to engage in both practical and theoretical science. Pupils should be taught to:

- Materials
- Seasonal changes and plants.
- Habitats, human biology and animals including humans.

KS2 pupils should continue to apply and develop a broader range of skills and knowledge, learning how to use them in different ways and to link them with previously taught knowledge. They should enjoy further exploration in more scientific concepts. They should develop an understanding of how different science can impact the world. Pupils should be taught to:

- Forces, light, sound, electricity and space.
- Rocks, states of matter and materials.
- Animals including humans, plants, habitats, human biology and evolution.

In Reception class Science is taught as part of *the world* area of learning within the Early Years Foundation Stage curriculum. Further details of how the Early Years curriculum is organised can be found on our Early Years policy.

In Years 1 to 6 Science is taught as a discrete subject, though meaningful links are made with other subjects in our curriculum, each knowledge organiser shows where there are links to the English through a related text. The topics we teach are outlined in the curriculum map for Science (see Appendix 1). This is published on our website.

Knowledge Organisers

Every topic has a knowledge organiser. This outlines the core knowledge taught within the topic, how many hours of teaching time allocated to the topic and the key vocabulary pupils are expected to understand and use. They also contain; images that relate to the scientific unit, a link to famous scientist for that topic, a related text and the *Sticky Knowledge* the essential learning that should be undertaken for that unit. All pupils have a copy of their knowledge organiser in their books and these are used to help pupils remember the key concepts. Knowledge organisers may also be taken home to support learning. All knowledge organisers can be seen on the relevant class pages of our website.

Teaching Time

Science is allocated the following time on our weekly timetables. Timetables are published on our website every half term.

Early Years Foundation Stage: 2 hours

Key Stage 1: 1 hour

Key Stage 2: 1 hour

The Teaching of Science (Implementation)

Teachers use a range of teaching strategies that best support the objectives of the lesson. The following list shows the most common methods of effective teaching related to Science.

- teacher instruction, explanation and modelling using resources such as the interactive whiteboard, online programmes and texts.
- use of quality text books and other sources of information, including books in our school library.
- pupil discussion, investigation and problem solving.
- regular review of previous learning or linked topics to enable pupils to remember key concepts. This may involve quizzes or other games to help embed knowledge and vocabulary.
- analysing information, making and testing out predictions.
- recording learning in written form in exercise books, including opportunities to write at length.

Resources

Curriculum resources such as Magnets, Rocks and a Materials are stored in the Science cupboard.

Recording Learning

In Science, pupils record their learning in the following ways:

- exercise books

Meeting The Needs of All Pupils

All pupils are entitled to a broad and balanced curriculum that meets their needs. Science is taught in class groups with all pupils included. All our teachers know the pupils in their class and their differing needs very well. They plan and adapt lessons to help all pupils know and remember more so they make very good progress.

Some pupils, including those with special educational needs or disabilities, or those with English as an additional language, may need extra support to access, understand and remember key concepts. For these pupils, teachers use a range of effective strategies, whilst promoting independent learning as far as possible. These may include:

- adapting and scaffolding pupil activities and resources

- focussed additional support from an adult in class
- extra pre learning or overlearning of key knowledge before or after the lesson

Some pupils very quickly grasp the main concepts being taught and are able to think more deeply to extend their learning. To ensure they reach their full potential, teachers may:

- set more complex activities that require thinking at greater depth
- ask pupils to apply their knowledge to a different situation
- go further by asking them to explain their thinking to others or present their findings to a group

Homework

- Homework is not usually given in Science but children are encouraged to explore the local area and environment and seeing how things change throughout the year.

High Quality Teaching and Subject Knowledge

To ensure the highest quality teaching and make sure teachers have the subject knowledge they need to meet the requirements of teaching Science in their class, teachers (and teaching assistants) receive a range of guidance and support, including:

- face to face and online training
- latest research and guidance in the best ways of teaching Science
- mutual support and discussion with colleagues, including joint planning, team teaching and paired marking
- *(mention anything else in relation to your subject)*

In addition, the subject leader for Science stays up to date with developments in the subject through leadership training and support from other subject leaders locally and within the LDST.

Assessment (Evaluating The Impact of Teaching)

Teachers constantly assess how far their pupils understand key concepts throughout lessons, mainly through questioning and observation. Quizzes and other games are regularly used to assess how far pupils have remembered learning from the lessons before. Teachers then adapt their teaching to ensure misconceptions or gaps in knowledge are addressed. In addition, they may need to introduce opportunities for more challenge or deeper thinking.

End of Unit Assessments

At the end of every topic teachers assess how far each pupil has understood the knowledge and skills involved. Pupils are assessed overall as either working towards the topic's objectives, meeting the topic's objectives or meeting the topic's objectives at greater depth. This is recorded in the following way.

The objectives for each Science unit are stuck in the children's books at the start of each topic. At the end of the unit, the children self-assess themselves against each objective using a colour code; red for not confident, yellow for nearly there and green for fully understand the objective. The teachers also assess the children using numbers 1 (WTS), 2 (EXS) or 3 (GDS) for the objective.

End of Term Assessments

At the end of every term, teachers evaluate the achievement of each child in their class in Science. They record this on a school data base. This helps teachers plan and adapt future lessons. The subject leader collates and analyses assessment data across the school. They pick out trends, strengths and weaknesses across the school and for different classes and groups. This information is shared with senior leaders and governors. All subjects have an action plan and a budget. Analysing pupil achievement helps the subject leader plan for improvements in the subject. This may take the form of targeted training, staff discussion and problem solving to improve an aspect of the curriculum. If analysis shows a particular group of children are underachieving, for example disadvantaged children, further measures are agreed and put in place to address this gap.

End of Year Assessments and Reporting To Parents

End of term assessments are pulled together at the end of each academic year to evaluate each pupils' overall attainment in Science. A child's attainment in Science is reported to parents through the end of year reports. For pupils in Y1 to Y6 a child's attainment is reported in the following way.

- wts working towards end of year expectations
- exs meeting end of year expectations
- gds meeting end of year expectations at greater depth.

In Reception class Science comes under The World area of learning. Each child in Reception is assessed as emerging, expected or exceeding the early learning goals in that area.

An INSET day is allocated towards the beginning of July where class teachers 'handover' their class to the next teacher. They discuss pupil achievement across the curriculum and ways future teaching should be adapted to meet the differing needs of the class.

Monitoring and Evaluation

The subject leader for Science monitors the quality of education regularly in accordance with the school's monitoring timetable. This may take the form of:

- learning walks and drop ins, usually with a member of the senior leadership team, and sometimes with a governor.
- book looks. The subject leader looks at a range of books or other evidence across the school, sometimes with senior leaders or an adviser / officer from the LDST or a governor.
- scrutiny of planning, particularly to evaluate coverage and progression within the curriculum as well as the extent to which planning is catering for the range of needs of pupils
- pupil conferencing
- surveys for pupils and/ or staff
- more formal lesson observations (with a member of the senior leadership team).

Subject leaders have regular support meetings with the senior leadership team where aspects of the subject policy and action plan are monitored and discussed. Resulting actions may emerge with additional leadership support, resources or policy changes implemented. Subject leaders routinely have a teacher appraisal objective linked to an aspect of their subject leadership.

Following all these activities, strengths and areas for development are reported and discussed with staff. Resulting actions are recorded on the subject action plan and reported to governors. At the end of each year the action plan for Science is fully evaluated and published. In addition, the subject leader evaluates how far Science is meeting our curriculum intent statement. This evaluation feeds into the action plan for the following year. Evaluated action plans and evaluations are reported to the senior leadership team and governors. If, following school self-evaluation, it is agreed that Science should be prioritised to significantly strengthen the quality of education, it becomes part of the School Improvement Plan. If this is the case, senior leaders and governors play a far more active role in supporting and monitoring the development of the subject. Additional resources may be targeted as necessary.

Role of Governors (from September 2020)

Every aspect within the School Improvement Plan has an allocated pair of governors. This pair of governors evaluates the activities within this aspect and the impact on the quality of education and pupil outcomes. They meet with subject leaders on a termly basis and review aspects of the subject, including seeing lessons in practice and talking to children. Their findings are reported to the Local Governing Board. In this way, leaders are held accountable for the aspects they are responsible for and subject leaders are able to access the appropriate support and resources to achieve their aims. If Science is not part of the School Improvement Plan for the year, lighter touch monitoring includes governors reviewing the progress of objectives in the action plan.

Appendix 1: Curriculum Map for Science

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Reception	Biology	Light/Dark – Physics	Freezing & Melting – Chemistry	Waterproof Materials – Chemistry	Growing – Biology	Life Cycles – Biology
Year 1	Seasonal Changes – Physics Observe and describe weather	Animals Inc. humans – Biology Body parts and senses.	Seasonal Changes- Physics Observe and describe weather	Materials – Chemistry Describe features of everyday materials. Wood, plastics, glass, metal and water.	Seasonal Changes- Physics Observe and describe weather	Plants – Biology Know common garden and wild plants. Basic parts of a plant or tree.
Year 2	Materials – Chemistry Everyday materials,	Living Things and Their Habitats – Biology	Animals Including Humans – Biology	Plants – Biology Parts of a plant Life cycles	Plants – Biology Parts of a plant Life cycles	Living things & their habitats – Biology Food chains.
Year 3	Forces – Physics Magnets and poles. Friction	Animals Inc. humans – Biology Skeleton functions Nutrition of different animals.	Rocks/Materials – Chemistry Soil types Rock types Fossil formation	Plants – Biology Functions of a flower Seed dispersal Germination	Light – Physics Protection Shadow How light travels	Environmental Science How to look after the environment and what happens when we don't.
Year 4	Animals Inc. humans – Biology Digestive system. Function of teeth.	Sound – Physics How sound is made and travels. Recognising patterns in sound.	States of Matter – Chemistry Group solids, liquids or gases Water cycle, evaporation and condensation.	Electricity – Physics Series circuit Insulators and conductors	Living things & their habitats – Biology Food chains, identifying producers, predators and prey.	Environmental Science Recycling Deforestation of rainforests Pollution Litter

Year 5	<p>Materials – Chemistry</p> <p>Dissolving, evaporation, condensation. Solid, liquid and gases.</p>	<p>Materials – Chemistry</p> <p>Reversible and irreversible changes</p> <p>Burning/fire</p>	<p>Forces – Physics</p> <p>Air resistance, gravity, water resistance. Balanced and unbalanced forces.</p>	<p>Living things & their habitats – Biology</p> <p>Plants pollination</p> <p>Life cycles of different species groups.</p> <p>Changes as humans develop to old age.</p>	<p>Earth & Space – Physics</p> <p>Describe the movement of the Earth, and other planet.</p> <p>Describe the Sun, Earth and Moon</p>	<p>Environmental Science</p> <p>Global warming</p> <p>Ecology</p> <p>Greenhouse gases</p> <p>Atmospheric science</p>
Year 6	<p>Human Body – Systems – Biology</p> <p>Identify, describe and name the main parts of the human circulatory system.</p> <p>Recognise the impact of diet, exercise, drugs and lifestyle</p>	<p>Evolution – Biology</p> <p>Recognise that living things have changed over time.</p>	<p>Living things & their habitats – Biology</p> <p>Describe how living things are classified into broad groups</p>	<p>Electricity – Physics</p>		<p>Light – Physics</p> <p>Recognise that light appears to travel in straight lines.</p> <p>Light travels from light sources to our eyes or from light sources to objects and then to our eyes.</p> <p>Shadows have the same shape as the objects</p>