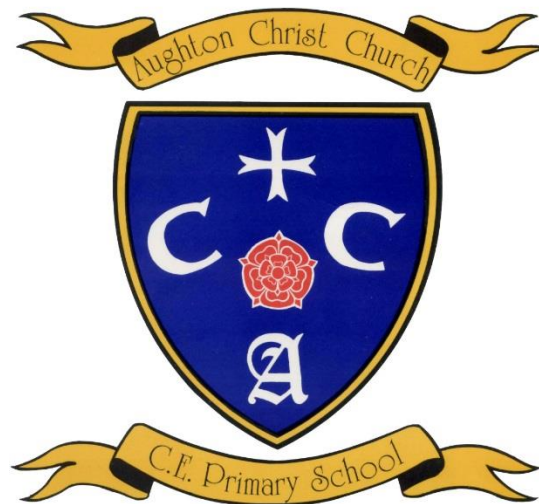


Policy Document

Aughton Christ Church C of E Primary School **Science Policy**



Review Date – January 2023
Next Review date – January 2024



Science Policy

1. STATEMENT OF CURRICULUM INTENT

Our Science curriculum meets the statutory needs of the national curriculum and is designed to meet the needs of all pupils at Aughton Christ Church C of E Primary School.

In consultation with parents, governors, pupils and staff, our broad and balanced curriculum is designed to continually build on knowledge and skills whilst supporting the children's spiritual, moral, cultural, mental and physical development. It prepares all children at the school for the opportunities, responsibilities and experiences of later life through developing resilience, independence and confidence.

This is achieved through a well thought out holistic approach to learning, encompassing high quality outdoor provision and extended opportunities. These experiences allow pupils to develop enquiry, skills and knowledge and a curiosity about the world around them and ask questions to deepen their own learning.

Children are inspired to learn through engaging, meaningful and creative experiences, which at every opportunity embrace the cultural diversity of our society. In addition to core skills and essential knowledge, children will develop an awareness and understanding of other people; their own community; the wider world and of their place within it to ensure they have opportunity to develop empathy, resilience, independence and confidence to become educated members of society.

1B. SCIENCE VISION

By the time our pupils leave Aughton Christ Church CE Primary School we want them to have grown and developed their scientific capital in readiness for the next step in their education. We hope to have inspired and provided future aspirations for pupils to make a scientific difference in the world they know. Science at Aughton Christ Church CE Primary School is exciting and inspiring; provides children with practical hands on experience; is challenging and thought provoking; relevant to real life; and inclusive for all children in our school.

Our science curriculum is thoughtfully planned and sequenced with opportunities to develop enquiry, scientific skills and knowledge. At Aughton Christ Church CE Primary School, we are all scientists.

2. MISSION STATEMENT

- To educate pupils intellectually, socially, morally, aesthetically, physically and spiritually within a school firmly based on Christian principles.
- To enable pupils to develop their talents, establishing positive and realistic goals.
- To promote Christian values within the school as exemplified by the life and teaching of Jesus Christ.
- To encourage in pupils a sense of decency, respect for others, commitment, self-reliance, responsibility and a healthy self-esteem.
- To help pupils to take their place in the community and to encourage an appreciation of the world in which they live.
- To prepare for the next stage of their education.

3. AIMS OVERVIEW

The aims of our science curriculum are identified within the NC 2014 as follows:

Scientific knowledge and conceptual understanding

Pupils should be able to describe associated processes and key characteristics in common language, but they should also be familiar with, and use, technical terminology accurately and precisely. They should build up an extended specialist vocabulary. They should also apply their mathematical knowledge to their understanding of science, including collecting, presenting and analysing data. The social and economic implications of science are important but, generally, they are taught most appropriately within the wider school curriculum: teachers will wish to use different contexts to maximise their pupils' engagement with and motivation to study science.

The nature, processes and methods of science

'Working scientifically' specifies the understanding of the nature, processes and methods of science for each year group. It should not be taught as a separate strand. The notes and guidance give examples of how 'working scientifically' might be embedded within the content of biology, chemistry and physics, focusing on the key features of scientific enquiry, so that pupils learn to use a variety of approaches to answer relevant scientific questions. These types of scientific enquiry should include: observing over time; pattern seeking; identifying, classifying and grouping; comparative and fair testing (controlled investigations); and researching using secondary sources. Pupils should seek answers to questions through collecting, analysing and presenting data. 'Working scientifically' will be developed further at key stages 3 and 4, once pupils have built up sufficient understanding of science to engage meaningfully in more sophisticated discussion of experimental design and control.

Spoken language

The national curriculum for science reflects the importance of spoken language in pupils' development across the whole curriculum – cognitively, socially and linguistically. The quality and variety of language that pupils hear and speak are key factors in developing their scientific vocabulary and articulating scientific concepts clearly and precisely. They must be assisted in making their thinking clear, both to themselves and others, and teachers should ensure that pupils build secure foundations by using discussion to probe and remedy their misconceptions.

EYFS Curriculum Aims

Pupils in Reception work within the Early Years Foundation Stage and follow the areas of Learning and the Early Learning Goals for Knowledge and Understanding of the World. They explore simple scientific areas through their curiosity of the world such as: problem solving, observing, predicting, thinking, making decisions and talking about the world around. At an early age, Science makes a significant contribution to developing a child's knowledge and understanding of the world through activities such as role-play, investigating scientific phenomena, handling and performing simple tests on materials, observations around our world and within animals, plants & humans and understanding scientific roles (professions) within our community: all of which make Science meaningful for our younger pupils.

KS1 Curriculum Aims

The principal focus of science teaching in key stage 1 is to enable pupils to experience and observe phenomena, looking more closely at the natural and humanly constructed world around them. They should be encouraged to be curious and ask questions about what they notice. They should be helped to develop their understanding of scientific ideas by using different types of scientific enquiry to answer their own questions, including observing changes over a period of time, noticing patterns, grouping and classifying things, carrying out simple comparative tests, and finding things out using secondary sources of information. They should begin to use simple scientific language to talk about what they have found out and communicate their ideas to a range of audiences in a variety of ways. Most of the learning about science should be done through the use of first-hand practical experiences, but there should also be some use of appropriate secondary sources, such as books, photographs and videos.

'Working scientifically' is described separately in the programme of study, but must always be taught through and clearly related to the teaching of substantive science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content.

Working scientifically

During years 1 and 2, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- asking simple questions and recognising that they can be answered in different ways
- observing closely, using simple equipment
- performing simple tests
- identifying and classifying
- using their observations and ideas to suggest answers to questions
- gathering and recording data to help in answering questions

LKS2 Curriculum Aims

The principal focus of science teaching in lower key stage 2 is to enable pupils to broaden their scientific view of the world around them. They should do this through exploring, talking about, testing and developing ideas about everyday phenomena and the relationships between living things and familiar environments, and by beginning to develop their ideas about functions, relationships and interactions. They should ask their own questions about what they observe and make some decisions about which types of scientific enquiry are likely to be the best ways of answering them, including observing changes over time, noticing patterns, grouping and classifying things, carrying out simple comparative and fair tests and finding things out using secondary sources of information. They should draw simple conclusions and use some scientific language, first, to talk about and, later, to write about what they have found out.

'Working scientifically' is described separately at the beginning of the programme of study, but must always be taught through and clearly related to substantive science content in the

programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content.

Pupils should read and spell scientific vocabulary correctly and with confidence, using their growing word-reading and spelling knowledge.

Working scientifically

During years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

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

UKS2 Curriculum Aims

The principal focus of science teaching in upper key stage 2 is to enable pupils to develop a deeper understanding of a wide range of scientific ideas. They should do this through exploring and talking about their ideas; asking their own questions about scientific phenomena; and analysing functions, relationships and interactions more systematically. At upper key stage 2, they should encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. They should also begin to recognise that scientific ideas change and develop over time. They should select the most appropriate ways to answer science questions using different types of scientific enquiry, including observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests and finding things out using a wide range of secondary sources of information. Pupils should draw conclusions based on their data and observations, use evidence to justify their ideas, and use their scientific knowledge and understanding to explain their findings.

'Working and thinking scientifically' is described separately at the beginning of the programme of study, but must always be taught through and clearly related to substantive science content in the programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content. Pupils should read, spell and pronounce scientific vocabulary correctly.

Working scientifically

During years 5 and 6, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
- recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs

- using test results to make predictions to set up further comparative and fair tests
- reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations
- identifying scientific evidence that has been used to support or refute ideas or arguments

4. IMPLEMENTING THE SCIENCE CURRICULUM

The programmes of study for science are set out year-by-year for key stages 1 and 2 (2014-15 programme of study). In line with this the use of Lancashire unit led learning are used to ensure pupils cover the correct key knowledge, conceptual knowledge, progression of skills and how to work scientifically. Additionally, ASE plan documents are used to support planning which highlight children's prior knowledge and potential misconceptions. Furthermore, opportunities are planned in to ensure pupils have time to engage in enquiry-based activities (either within or out of context of the scientific unit). Schools are, however, only required to teach the relevant programme of study by the end of the key stage in line with the end of year expectations in KS1 and KS2.

Curriculum Planning

Science is a core subject in the National Curriculum and we use the New National Curriculum for Science as a basis for implementing the statutory requirements of the programmes of study for Science.

We carry out the curriculum planning in Science in three phases, long term, medium term and short term

Long Term Planning

Curriculum maps for each year groups highlight the statutory requirements in Science and show the areas covered in Chemistry, Physics and Biology. Cross curricular links are made with topics which are relevant and these are updated on a regular basis to ensure consistency.

Medium Term Planning

Medium term unit plans are used from Lancashire to highlight areas of key knowledge and working scientifically within a unit led approach. Additionally, ASE Plan documents are used to support planning. These provide further detail and give specific ideas that teachers may use to inform future planning. In addition, further planning maps are available showing prior learning and examples of enquiry-based activities.

Short Term Planning

Weekly lesson plans are completed highlighting a sequence of learning over a unit, which shows a progression of knowledge. The lesson sequence will recap key knowledge, following this a main input and focused on teaching learning and plenary. Within this planning tool, assessment types and questioning are documented, with learning objective, key skill, enquiry type (if appropriate), working scientifically, health and safety, differentiation, vocabulary and notes for teachers as an assessment tool to inform planning.

Teaching and Learning

Science is taught in line with the NC 2014 and follows a year group specific, unit led approach through Lancashire within a weekly lesson. Lessons are planned to the specific

year group and within classes, pupils can be taught individually, grouped according to age/ability/social or more formally as a class, depending upon the learning tasks and the professional judgment of the class teacher. Lessons focus on developing understanding and knowledge, but will also develop skills and enquiry of science, providing a whole well-rounded approach to this subject. Teaching follows a sequence of lessons in which children's learning is developed, dispelling misconceptions and cementing key knowledge. The teaching of Science includes opportunities to develop our children in through the following methods:

- Revisit/recap – these starting activities have been tailored to revisit areas of science that have not been taught for a number of years. (e.g. Light Y4 – Y6: a revisit/recap may include recovering how an object can affect a shadow). This ensures children's key knowledge is constantly revisited in readiness for the progression in the future, and therefore allows more time for subject progression.
- Investigations & experiments – pupils have opportunities to investigate scientific questions, ideas and phenomena, recording results and develop experiments through the testing of a hypothesis.
- Discussions and debates – these are used to promote children's thoughts/curiosity about significant events (past and present). These allow pupils to raise questions that they may want to find out about and prove concepts.
- Significant/leading scientists – where appropriate, people of significant (past and present) are used to give pupils a sense of realism in science (e.g. Charles Darwin in Evolution Y6, Mary Anning in Fossils Y3)
- Role play and drama – To give visual representation of scientific concepts and help explain more difficult concepts (e.g. gas molecules when released from a can)
- External visits – pupils have opportunities to experience science outside the classroom at fairs and high schools.
- Use of ICT for research – Develop independent research through secondary sources. Additionally, the use of videos, photography, data recording and recording/writing.
- Scientific enquiry opportunities linked to year specific units focusing on the areas of enquiry: observing over time; pattern seeking; identifying, classifying and grouping; comparative and fair testing (controlled investigations); and researching using secondary sources. Pupils should seek answers to questions through collecting, analysing and presenting data. All of which, are documented in books (KS2) interactive displays (KS1) and floor books (EYFS).

Cross-Curricular Opportunities

English: The skills of speaking and listening, reading, and writing contribute towards science in our curriculum. Although lessons take many forms and may not cover all these areas, English still has a fundamental role in exploring, investigating and communicating ideas, predictions, results, conclusions and evaluations and English should be strongly evident across the curriculum.

Mathematics: Mathematics is linked to science strongly with links being made through STEM were possible. The use of number is evident within and across many science lessons through the use of measure including: place values in time recording, angles of degree, pattern seeking number sequences, estimations in predictions, proportions and percentages of amounts in solutions, as well as the averages of data through mode, mean, median and range. Additionally, the presentation of results can be weighted towards maths with graphs, charts and pictograms used to interpret and represent data.

Computing: Pupils are able to develop their data handling skills when recording through software. Research and develop understanding through well-selected sources as part of

their scientific enquiry. Develop IT skills through word processing, presentations and information handling.

Special Educational Needs

Science is valued highly within our school and is taught to all pupils, regardless of their needs. Science forms part of the school curriculum policy to provide a broad and balanced education to all pupils. We provide learning opportunities that enable all pupils to make progress and set suitable learning challenges to respond to each pupil's different needs. Support is given, where needed, to facilitate children to meet the expectations to their peers.

Inclusion/Equal Opportunities

All pupils have equal access to the Science Curriculum and opportunities are provided for all pupils to achieve, including girls and boys, pupils with special educational needs, pupils who are more able, pupils with disabilities, pupils from all social and cultural backgrounds, pupils from different ethnic groups and pupils from diverse linguistic backgrounds.

More Able, Gifted and Talented

Those pupils should be given opportunities to further explore areas of science that broaden and develop understanding, often linking to real-life topical areas of interest (e.g. sickle-cell anaemia in red blood cells) to develop further curiosity in science and further questioning, which may be explored at home in their own time. Pupils should also be provided with chances to challenge and explore scientific views and phenomena (double rainbows, what is white light made up of, solar eclipses) that develops understanding further than the key knowledge.

Health and Safety

Health and safety are an integral part of Science and therefore staff are asked to document any H&S areas of consideration in their weekly planning. Staff are also aware of the 'Be Safe' H&S Science book which is located within the Year 6 classroom. Staff are reminded to consult this book regularly to ensure they are taking into account the full consideration of risks of food hygiene, working outside the classroom, plants, chemicals and animals. Furthermore, pupils are always briefed over safety procedures before the lesson with guidelines and boundaries made clear with regards to the use of equipment. On the occasions, that pupils may develop experiences out of the ordinary classroom experience, parental consent is always requested (dissecting hearts in Y6). When pupils and staff visit external venues for Science based activities, teachers must complete a risk assessment and be aware of the school emergency procedures for trips and Local Authority's policies on visits and excursions within and outside the local area.

5. IMPACT – MONITORING, ASSESSMENT AND REPORTING (See Assessment, Recording and Reporting Policy)

End of Key Stage Teacher Assessment (Y2 & 6)

Statutory end of key stage teacher assessment is gathered through the professional judgements made by the class teacher in Year 2 and Year 6 and are determined against the pupil 'I can' statements. Whilst these are made within the year group teacher in Year 2 and Year 6 will consider previous assessments in earlier year groups to make professional judgements.

Monitoring Progress

Pupil's initial understanding of a topic is captured prior to a unit through discussions, maps, grids and questioning. Teachers are also aware of the prior learning covered within the curriculum and are informed if a cohort has developed further than the expected key knowledge within a particular unit.

Within and across units of science pupil's understanding is captured through a variety of AFL techniques bespoke for science within our school including: concept cartoons, tailored questions, misconceptions, kahoot, plickers, next step marking, pluses and negatives, what if thoughts, prove it and disprove it and reflections. All of which highlight the progress pupils make in developing their scientific understanding. Additionally, at the end of the unit pupil's understanding is captured through the above methods enabling teachers to make sound, well-informed decisions about age related expectations.

Internal Monitoring

Teachers will make end of unit judgements using their knowledge of the pupils within the series of lessons. This judgement is made through the various assessment measures, written work in workbooks, discussion and scientific understanding. These judgements are well-rounded and discussed professionally if in doubt and recorded in the subject leader location under unit assessments, which will inform future planning and the Science leader.

Reporting

Teachers report to parents at Parents' Evenings scheduled during the Autumn and Spring Terms and annually, through a written report. A further informal evening opportunity is given at the end of the Summer term to allow parents to discuss their child's report. Science is also reported at the end of key stages in line with the end of key stage expectations.

Role of Governors/Parents

Regular reports are made to the governors on the progress of Science provision and to our Curriculum Committee by the co-ordinator and Head teacher.

This policy will be reviewed every year or in the light of changes to legal requirements.

Our governors determine, support, monitor and review the school's policies.

We believe that parents have a fundamental role to play in helping pupils to learn. We do all that we can to inform parents about what and how their pupils are learning by:

- Holding a 'meet the teacher' evening at the start of the school year to inform parents how all aspects of Science (and other subjects) are taught throughout the school year.

- Holding parents' evenings to discuss children's progress.
- Sending an annual report to parents in which we explain the progress made by each child and indicating how the child can develop their learning.
- Induction programme – 'starting out together' Reception teacher explains how parents can support pupils in the early learning goals

The role of the subject leader

- Conduct school audits
- Observe/ monitor teaching and assess staff
- Analyse data and Pupil Progress along with the Head teacher
- Monitor planning
- Undertake book sampling
- Carry out walkthroughs and assess learning environments
- Create an action planner (School Development Plan)
- Plan and deliver new initiatives
- Peer coaching
- CPD – keep up to date with developments in Science
- Inform and provide opportunities for staff development
- Audit and ensure resources are accessible and relevant
- Take part in moderation with local schools.
- Take part in cluster meetings local schools
- Develop STEM opportunities in school through science days

The Science Subject Leader in school is Mr Nicholas Swift

Termly monitoring and evaluation of the Science Curriculum will be carried out by the Subject leader and feedback given to staff as a result of this.