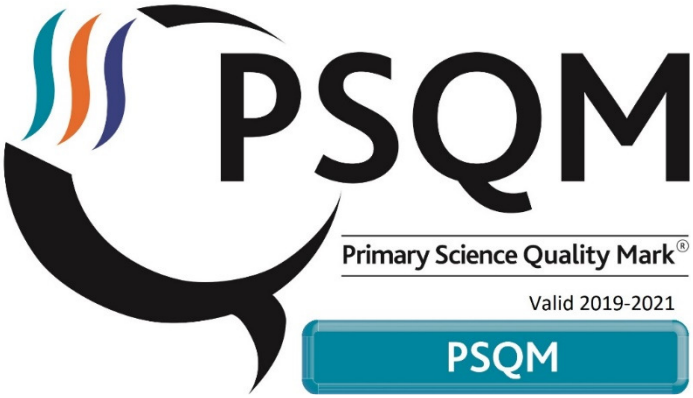
Science Policy

Alice Ingham RC Primary School

Journeying to Excellence
Through Faith and Learning

Last reviewed on:	September 2021
Next review due by:	September 2022

Contents



1. Curriculum Statement

Intent

The 2014 national curriculum for 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 skills required to understand the uses and implications of science, today and for the future. We understand that it is important for lessons to have a skills-based focus, and that the knowledge can be taught through this

At Alice Ingham, we encourage children to be inquisitive throughout their time at our school and beyond. The Science curriculum fosters a healthy curiosity in children about our universe and promotes respect for the living and non-living. We believe science encompasses the acquisition of knowledge, concepts, skills and positive attitudes. Throughout the programmes of study, the children will acquire and develop the key knowledge that has been identified within each unit and across each year group, as well as the application of scientific skills. We ensure that the Working Scientifically skills are built-on and developed throughout children's time at the school so that they can apply their knowledge of science when using equipment, conducting experiments, building arguments and explaining concepts confidently and continue to ask questions and be curious about their surroundings. Above all, we promote a love of Science learning.

Implementation

Teachers create a positive attitude to science learning within their classrooms and reinforce an expectation that all pupils are capable of achieving high standards in science. Our whole school approach to the teaching and learning of science involves the following;

● Science will be taught in planned and discrete topic blocks by the class teacher, to have a project-based approach. This is a strategy to enable the achievement of a greater depth of knowledge.

●Through our planning (following the Hamilton Trust planning Scheme), we involve problem solving opportunities that allow children to apply their knowledge, and find out answers for themselves. Children are encouraged to ask their own questions and be given opportunities to use their scientific skills and research to discover the answers. This curiosity is celebrated within the classroom. Planning involves teachers creating engaging lessons, often involving high-quality resources to aid understanding of conceptual knowledge. Teachers use precise questioning in class to test conceptual knowledge and skills, and assess pupils regularly to identify those children with gaps in learning, so that all pupils keep up.

- We build upon the knowledge and skill development of the previous years. As the children's knowledge and understanding increases, and they become more proficient in selecting, using scientific equipment, collating and interpreting results, they become increasingly confident in their growing ability to come to conclusions based on real evidence.
- Working Scientifically skills are embedded into lessons to ensure these skills are being developed throughout the children's school career and new vocabulary and challenging

concepts are introduced through direct teaching. This is developed through the years, in-keeping with the topics.

- For investigations in KS1, a similar strategy to Discovery Dog is used. This allows children to work collaboratively and discuss their investigations as a whole class. This allows children's knowledge and understanding to increase. For investigations in KS2, Post-It planning is used. This allows the children to work collaboratively in their groups and allows them to deepen their learning by discussing the different variables possible before choosing specific ones to work with.
- Children are offered a wide range of extra-curricular activities, visits, trips and visitors to complement and broaden the curriculum. These are purposeful and link with the knowledge being taught in class.
- Regular events, such as Science Week or project days, such as the Science fair, allow all pupils to come off-timetable, to provide broader provision and the acquisition and application of knowledge and skills. These events often involve families and the wider community.

Impact

The successful approach at Alice Ingham results in a fun, co-operative, engaging, high-quality science education, that provides children with the foundations and knowledge for understanding the world. Frequent, continuous and progressive learning outside the classroom is embedded throughout the science curriculum. Through various workshops, afterschool clubs, trips, opportunities to be a Science ambassador and interactions with experts, children have the understanding that science has changed our lives and that it is vital to the world's future prosperity. From this exposure to a range of different scientific enhancements, all children feel they are scientists and capable of achieving. Children at Alice Ingham overwhelmingly enjoy science and this results in motivated learners with sound scientific understanding.

2. Teaching and Learning

Staff and children were involved in the creation of the Alice Ingham Science Key Principles.

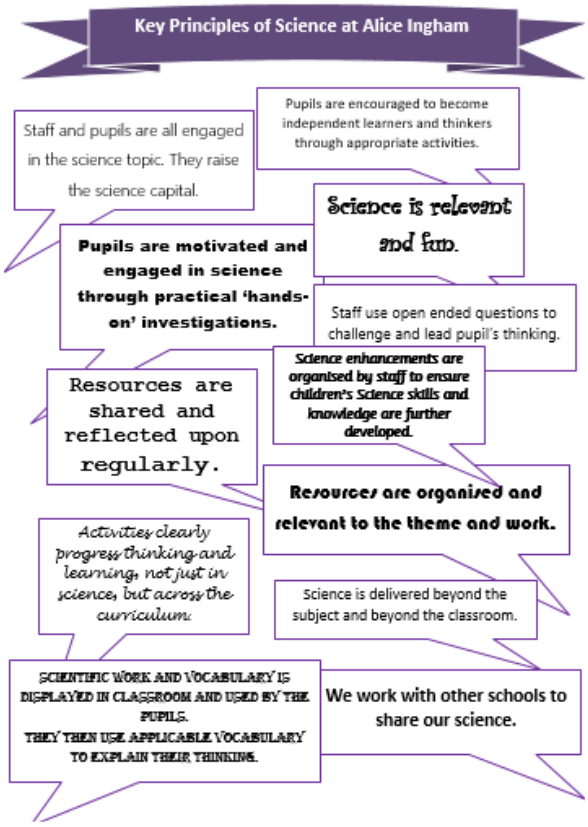


Figure 1 Science principles informed by staff and pupil voice, to represent Alice Ingham's vision for science learning.

These posters are displayed on the Science working walls within classrooms and in the front of every child's Science book. They are referred to throughout the coverage of each Science topic.

- Staff and pupils are all engaged in the science topic. They raise the science capital.
- Pupils are encouraged to become independent learners and thinkers through appropriate activities.
- Pupils are motivated and engaged in science through practical 'hands-on' investigations.
- Science is relevant and fun.
- Staff use open ended questions to challenge and lead pupil's thinking.
- Resources are shared and reflected upon regularly.
- Activities clearly progress thinking and learning, not just in science, but across the curriculum.
- Resources are organised and relevant to the theme and work.
- Science enhancements are organised by staff to ensure children's Science skills and knowledge are further developed.
- Science is delivered beyond the subject and beyond the classroom.
- We work with other schools to share our science.

- Scientific work and vocabulary is displayed in classroom and used by the pupils. They then use applicable vocabulary to explain their thinking.

Scientific knowledge and conceptual understanding

The programmes of study describe a sequence of knowledge and concepts. While it is important that pupils make progress, it is also vitally important that they develop secure understanding of each key block of knowledge and concepts in order to progress to the next stage. Children's starting points are identified at the beginning of each Science topic and the children are able to convey and record what they know already. At the end of the block, children's knowledge is checked in line with the key knowledge identified prior to the teaching block. 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 and teachers ensure that this is developed within each lesson and throughout each Science topic. The Science curriculum ensures that children are provided with regular opportunities to apply their mathematical knowledge to their understanding of Science, including collecting, presenting and analysing data. Through use of the KWL strategy, children are also able to suggest what they would like to learn at the start of each teaching sequence and this ensures that teachers are able to adapt the programme of study to ensure that this is informed by children's interests and to maximise their 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 and this is embedded within lessons and focuses 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 include: observing over time; pattern seeking; identifying, classifying and grouping; comparative and fair testing (controlled investigations); and researching using secondary sources. Pupils are given opportunity to seek answers to questions through collecting, analysing and presenting data.

Spoken language

The national curriculum for Science reflects the importance of spoken language in pupils' development across the whole curriculum – cognitively, socially and linguistically. At Alice Ingham Science lessons provide a quality and variety of subject specific language to enable the development of children's confident and accurate use of scientific vocabulary and their ability to articulate scientific concepts clearly and precisely. They are encouraged and assisted in making their thinking clear, both to themselves and others, and teachers ensure that pupils build secure foundations by using discussion to probing and remedying their misconceptions.

3. Assessment

Children's progress is continually monitored throughout their time at Alice Ingham Primary School and is used to inform future teaching and learning. By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study as set out in the National Curriculum. These are set out as statutory requirements. Children receive effective feedback through teacher assessment, both orally and through written feedback in line with the success criteria. Assessment for learning is continuous throughout the planning, teaching and learning cycle. However children are more formally assessed half termly in KS1 and KS2 using a variety of methods:-

● Observing children at work, individually, in pairs, in a group, and in classes.

● Questioning, talking and listening to children

● Considering work/materials / investigations produced by children together with discussion about this with them.

In line with the KWL strategy, children identify what they know already about each topic, as well as what they would like to know. The programme of study is responsive to the children's starting points, as well as their specific interests. It also ensures a focus on the key identified knowledge of each topic, which is mapped within and across year groups to ensure progression. At the end of each blocked science topic, this key knowledge is checked and inputted on to our data tracker 'O-Track'. During the Foundation Stage, children begin to explore the world around them, with specific Science work covered through the Early Learning Goal 'Knowledge and Understanding of the World'.

4. Planning and Resources

Planning is a process in which all teachers are involved. Planning should be done with partner teachers. All teachers should keep a copy of the termly and weekly planning in their files. We use the Hamilton Trust Science scheme of work and the teachers can also use TAPs (Teacher Assessment in Primary Science) planning to also inform their planning. The Science co-ordinator also ensures that resources/planning is up-to-date by engaging with Science networks and being a member of Associate of Science Education (ASE).

Further evidence of 'good Science' taking place in classrooms includes:

● An active learning environment, showcasing the Alice Ingham's Science Principles, and relevant Working Scientifically and investigation work on the working walls during Science topic coverage. This includes Discovery Dog in KS1 and Post-It Planning in KS2.

● Children being encouraged to ask and answer questions and discuss their work and ideas.

● Children devising and conducting their own investigations within the context of the relevant curriculum content, as well as being given opportunities to develop their working scientifically skills.

● Children recording their findings in a variety of ways.

● Children showing enjoyment in the activities they are undertaking.

● We keep resources in a central store, where they are easily accessible to all staff. EYFS have a range of resources kept in classes, for simple access for children during exploration.

5. Organisation

Science lessons should be taught weekly. Each week, there should be one session for exploration and investigation and then another session for writing up.

Science Long Term Plan

Year Group	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 1	Ourselves – Animals including humans	Our Pets – Animals including humans	Let's Build – Everyday Materials	Marvellous Materials – Everyday Materials	Wonderful Weather - Seasonal Changes	What's Growing in our Garden - Plants
Year 2	Animals including humans	Living things and their habitats	Everyday Materials - Materials Matter	Everyday Materials – Squash, Bend, Twist, Stretch	Plants: Ready, Steady, Grow!	Living things and their habitats- Gardens and Allotments
Year 3	Animals including Humans: Keeping Healthy	Light: Light and Shadows	Rocks: Rocks and Fossils	Forces and Magnets: Amazing Magnets	Plants: Roots and Shoots	Plants: Artful Flowers, Fruits and Seeds
Year 4	Electricity: It's Electric	States of Matter: States of Matter Scientists	Sound: Listen Up	Living Things and their Habitats: Name that living thing!	Animals, including humans: Excuse me, are these your teeth?	Living things and their habitats: Help our Habitats!
Year 5	Earth and Space: Space	Forces: May the forces be with you	Properties and changes of materials: Music festival materials	Properties and changes of materials: Changing materials	Living Things and their Habitats: The art of living	Animals (including humans): Life Explorers
Year 6	Light : Crime lab investigations	Electricity: Electric celebrations	Living Things and their Habitats: Classification Connoisseurs	Evolution and Inheritance: Game of Survival	Animals including humans: The Art of being Human	Second-look Science – The Science of Sport

6. Equal Opportunities (e.g. Gender, race)

At Alice Ingham, we are committed to providing all children with an equal entitlement to scientific activities and opportunities regardless of race, gender, culture or class.

7. Inclusion (e.g. EAL/SEN/PPG/Provision for HA)

All children are encouraged and supported to develop their full potential in Science.
Some children may require extra support in the classroom and opportunities for consolidation and reinforcement. We have implemented a co-operative learning approach, especially in Science. This co-operative learning structure aims to enhance all children's learning through peer learning/teaching. This will enable children with learning and/or physical difficulties to take an active part in scientific learning and practical activities and investigations and to achieve the goals they have been set. By being given enhancing and enriching activities, more able children will be able to progress to a higher level of knowledge and understanding appropriate to their abilities.

8. Role of the Subject Leader

It is the responsibility of the subject leader to monitor the standards of children's work. The subject leader is also responsible for supporting colleagues in their teaching, for being informed about current developments in the subject, and for providing a strategic lead and vision for science in the

school. The subject leader monitors the resources, planning and Science coverage. They are also responsible for booking Science trips and workshops to support learning. The subject leader has an allocated time for fulfilling the task of reviewing samples of children's work, lesson visits, training, liaising with other subject leaders from other schools, liaising with staff members about their lessons, pupil/staff voice, monitoring O-Track data and organising Science enhancements.

9. Parents (Including Homework)

Parental input is highly valued and parents are regularly invited and welcomed into school so that the children can share what they have been learning with them. There will be an annual Science Fair during Science week which is another opportunity for the children to share experiments/ learning with their parents. Children may be asked to complete a Science experiment at home so that they can enter the Science Selfie competition that is held each year.