At Ashfield Valley we care for and value every child in a nurturing, inclusive environment.

All members of our school community will work hard to ensure that every pupil achieves their full potential and has the opportunity to shine.

Science Policy

Reviewed: June 2024

Date of next review: June 2025

Rationale

This policy details the provision we make for the learning and teaching of Science at our school and in particular:

- The importance the school attaches to first class teaching and learning opportunities in Science as an entitlement to all its pupils.
- To provide support and reference to staff to ensure a consistency with both quality and approach.
- To highlight how the curriculum has been designed to ensure breadth, balance, continuity and progression in the outcomes of all subjects.
- The teaching and learning styles encourage our children to work scientifically.
- How we have organised the Science curriculum, developed its outcomes and how this is monitored and assessed.
- How summative and formative assessment is used to assess the children's progress in and across key stages against
  objectives defined for individual subject outcomes.
- To emphasise that high quality teaching and learning of Science is the responsibility of all staff.

Purpose

The purposes to this policy are to:

- Highlight the importance and value our school attaches to pupils learning Science and to developing as young scientists.
- Recognise and establish an entitlement to learning and teaching in Science for all our pupils as a statutory educational requirement.
- Make explicit our expectations in terms of subject outcomes and performance for pupils in Science as they progress through the school.
- Ensure continuity and progression in terms of subject knowledge, skills application and the development of appropriate attitudes and values.
- Clarify how we will assess, record and communicate the performance of our pupils in Science as they progress through the school.
- Outline the approach to learning and teaching Science our school has adopted.

The value of Science within our curriculum

At Ashfield Valley we believe every child should have the chance to explore, investigate and develop a continually evolving knowledge and understanding of our world today and for the future.

Science makes an increasing contribution to all aspects of life. Children are naturally fascinated by everything in the world around them and Science makes a valuable contribution to their understanding. By talking together children can be encouraged to explore and observe so that they can group objects and events and look for similarities and differences. They will need to measure and record the things they have found out in ways that make sense to them so that later they can talk to other people about what they have discovered. They should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes.

The national curriculum for science aims to ensure that all pupils:

- Develop lively, enquiring minds and the ability to question.
- Learn scientific skills and knowledge;
- Build on their natural curiosity and enable them to understand and care for the world in which they live.
- Are provided with an environment where they can work in an investigative way and can communicate their findings in a variety of ways.
- Can use equipment safely and sensibly.
- Develop the potential scientific links with all other areas of the curriculum.
- Develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics.
- Develop an 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.

Intent

Ashfield Valley aims to provide all children with the opportunities and resources to develop them as young Scientists. We achieve this by understanding what our school and children need to become better at Science, then select and plan our topics and lessons to support this ensuring progression throughout the school, with the appropriate level of challenge and support being provided to allow them to work scientifically in a more rigorous manner as they progress through school to ensure they are next stage ready at every stage.

Implementation

Science and the National Curriculum

At Ashfield Valley we base our teaching on the National Curriculum Programmes of Study and this is particularly helpful with ensuring that there is continuity and progression.

The National Curriculum document for Science sets out a clear, full and statutory requirement for all children. It determines the content of what will be taught, and sets attainment targets for learning. The programmes of study set out what should be taught at Key Stage 1 and 2 and The Foundation Stage programmes of study for Understanding of the World are set out in the EYFS.

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. Insecure, superficial understanding will not allow genuine progression: pupils may struggle at key points of transition (such as between primary and secondary school), build up serious misconceptions, and/or have significant difficulties in understanding higher-order content.

We use the National Curriculum Programmes of Study as a baseline. We want our pupils to use and apply Science knowledge across the curriculum by combining STEAM subjects where possible to enhance our pupils learning experiences and application of knowledge.

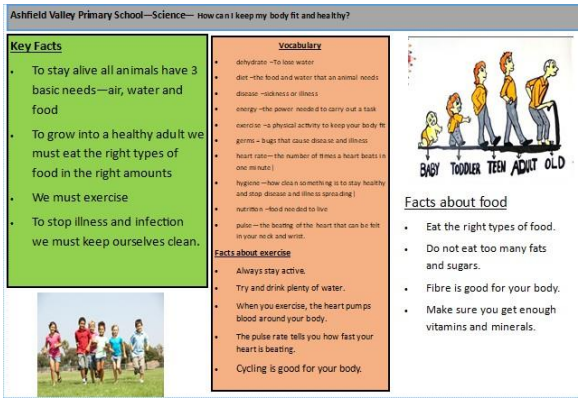
Science is taught for at least one hour per week in all year groups.

Each group has a clear overview and progression of knowledge and skills to use when planning Science lessons.

Curriculum Coverage (see Science Curriculum Overview for a detailed overview)

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Working Scientifically		Working Scientifically		Working Scientifically	
Plants Animals Inc. Humans Everyday materials Seasonal change	Living things and their habitat Plants Animals Inc. Humans Uses of everyday materials	Plants Animals Inc. Humans Rocks Light Forces and magnets	Living things and their habitats Animals Inc. Humans States of matter Sound Electricity	Living things and their habitats Animals Inc. Humans Properties and changes of materials Earth and space Forces	Living things and their habitats Animals Inc. Humans Evolution and inheritance Light Electricity

Teachers use resources from the Rising Stars, Pzaz and PLAN to support their planning of learning journeys. Medium term plans are used to plan high quality Science lessons. Teachers provide knowledge organisers to pupils to use at home to support their learning in Science.

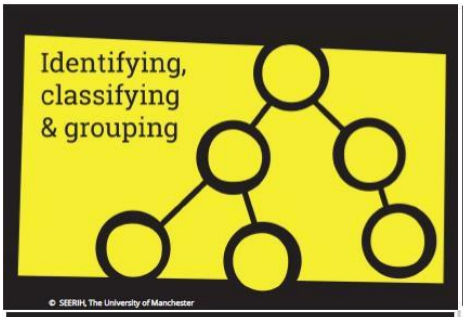


Working Scientifically

'Working scientifically' specifies the understanding of the nature, processes and methods of science for each year group. It is not taught separately as a strand, but instead taught through and clearly related to the teaching of substantive science content in the programme of study.

The five 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 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.



*images used to develop awareness of five areas of Working Scientifically within the classroom, planning and learning resources.

EYFS

Within the EYFS, Science is integral to the Early Learning Goal of Understanding the World. Through carefully planned lessons and resourced provision, the Early Years Curriculum develops the foundations of what it means to be a scientist. Activities are carefully planned to meet the Early Learning Goals and develop characteristics of effective learning which underpin all of the skills and knowledge needed to ensure our pupils are next stage ready. Bilingual staff effectively use translation to introduce scientific vocabulary and understanding to the children.

Early Learning Goals - The Natural World
Children:

- Explore the natural world around them, making observations and drawing pictures of animals and plants;
- Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class;
- Understand the effect of the changing seasons on the natural world around them.

KS1
Within key stage 1, we ensure that our expectations enable all pupils to establish and begin to develop the key skills, knowledge and principals of working as a scientist and the content outlined in the National Curriculum. Developing on the outcomes achieved by the EYFS, the children extend their knowledge of seasons and use their observation skills and experiences to date to embark on their journey as young scientists. In Key Stage one there is a stronger emphasis on the teaching of knowledge and vocabulary.

The principle 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 are encouraged to be curious and ask questions about what they notice. They are 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 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 is done through the use of first-hand practical experiences with the additional use of appropriate secondary sources, such as books, photographs and videos to deepen pupils' knowledge.

Lower Key Stage 2
The curriculum enables pupils to broaden their scientific view of the world around them. They 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 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 draw simple conclusions and use some scientific language, first, to talk about and, later, to write about what they have found out.

Upper Key Stage 2
The curriculum enables pupils to develop a deeper understanding of a wide range of scientific ideas. They 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 encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. They also begin to recognise that scientific ideas change and develop over time. They

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 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.

SMSC and British Values

At Ashfield Valley the teaching and development of SMSC and British Values is not a separate subject that is taught explicitly but an aspect of learning that should be present throughout the school in both its lessons and the behaviour from everyone in and around school.

SMSC

Children will have opportunities to:

Spiritual Education

- Looking for meaning and purpose in natural and physical phenomena.
- Wonder about what is special about life.
- An awareness of the scale of living things from the small micro-organism to the largest.
- The interdependence of all living things and materials of the Earth.
- Emotional drive to know more and to wonder about the world.
- Wonder at the vastness of space and the beauty of natural objects.

Moral Education

- Pupils to become increasingly curious.
- Development of open mindedness to the suggestions of others.
- Scientific developments may give rise to moral dilemmas.
- Considering the environment.

Social Education

- Group practical work.
- Team working skills and to taking responsibility.
- Taking responsibility for their own and other people's safety.
- Understanding that science has a major effect on the quality of our lives.
- Consider the benefits of scientific developments and the social responsibility involved.

Cultural Education

- Scientific discoveries as a part of our culture.
- Scientific discoveries of other cultures.
- Scientific discoveries by a wide range of men and women in many different cultures.
- Environmental issues are central to science.

British Values

Democracy

- Take the views and opinions of others into account.
- Take turns and instructions from others.

The rule of law

- Understand the importance of safety rules when working scientifically.
- Know that there are consequences in rules are not followed.

Individual liberty

- Make choices when planning an investigation.
- Others may have different points of view as to where to start.

Tolerance

- Scientific discoveries have come from other cultures.
- Religious beliefs often compete with scientific understanding.

Mutual respect

- Work as a team.
- Discuss findings.
- Offer support and advice to others.

Inclusion, equality of opportunity and differentiation

Science forms an integral and statutory element of a pupil's entitlement to learning and at our school we ensure that all pupils can engage with science learning and develop as young scientists irrespective of their race, cultural background, gender, sexual identity, religion, creed, level of intellectual ability or physical and emotional circumstances.

Differentiation is a fundamental and core element of inclusion. Teachers plan and resource learning in line with our whole school policies, to enable all pupils to make good and sustained progress in Science including those with special educational needs, those with disabilities and those identified as more able and those with English as an additional language. In our differentiation planning we take due regard of factors such as classroom organisation, learning materials and the learning environment.

Connecting Science to other areas of the Curriculum

Science is a subject where pupils are given the opportunity to 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 use different contexts to maximise their pupils' engagement with and motivation to study science.

Science content is also used to support writing for a purpose in English. For example, pupils in Year 6 use their

knowledge of the circulatory system to write an explanation text.

At Ashfield Valley we value using and applying knowledge and skills across the curriculum such as Year 4 making torches in design technology.

Impact-Expectations of outcomes

At our school an important outcome is for all pupils to develop as young scientists and we achieve this by recognising and planning for what becoming better at Science entails – progression - and consequently challenging and supporting our pupils to work scientifically in a more rigorous manner as they progress through the school. To enable this to happen we have established an outcomes driven curriculum which recognises the crucial importance of identifying what we want our pupils to know and do in Science at every stage.

Our aim is to ensure all of our children meet at least age related expectations in science and they are next stage ready at every level. We want our pupils to be naturally fascinated by everything in the world around them and to understand that science makes a valuable contribution to their understanding of the world in which they live.

Assessment and reporting-
A summative assessment about the pupil's knowledge and understanding of Science is carried out half termly. This assessment is carried out through the use of Rising Stars assessments. Assessment are shared with the senior leaders and the science subject developer and end of year overall judgement for science is shared with parents in the form of an end of year report.

On these occasions teachers should draw upon the intelligence gained from the formative assessment of pupils, which is integral to lessons, to make a summative judgement as to whether the pupil has achieved the expected level of attainment detailed in the performance descriptor, exceeded the expectations or has yet to reach the anticipated level. Evidence is drawn from a wide range of sources to inform this process including interaction with pupils during discussions and related questioning, day to day observations and practical activities.

Most critically this decision is based on the professional knowledge and judgement that the teacher possesses of the pupil, built up over an extended period of time, which is then used to make a rounded and holistic judgement of their attainment in Science.

Monitoring and Evaluation and the role of the subject leader-
All teachers at our school are responsible for monitoring standards in science but the science subject leader, under the direction of the Headteacher, takes a lead in this. Monitoring activities take place every half term and form part of the Science leader's leadership schedule. In summary, these include:

- Analysing samples of pupils' science work to moderate standards (attainment and progress against outcomes and end of stage performance descriptors) to ensure consistency.
- The moderation of teachers' planning to monitor coverage and delivery of planned objectives.
- Lesson observations and learning walks to ensure that learning and teaching is appropriately engaging and challenging and that the anticipated subject progress is being made by the pupils.
- The sampling of pupils' work to ensure that expectations in terms of subject outcomes are being maintained through the curriculum.
- Speaking to pupils about their science lessons and what they know and remember about the subject.
- The subject leader provides feedback to staff about the quality of Science being taught.
- In collaboration with the senior leaders, the subject developer completes a science action plan.

The Science leader has the responsibility to take a lead in developing Science further across the school within the school's development plan; monitoring the effectiveness of teaching and learning; and the use of resources. Teachers and educational support staff can expect support from the Science leader arising from targets identified in the school improvement plan.

To develop staff confidence and competence in teaching Science the leader will:

- Attend subject professional development opportunities as they arise and in the context of the priorities of the whole School Development Plan together with the Science Action Plan.
- Identify and source staff training needs arising.
- Arrange for relevant advice and information from professional development programmes, including courses, to be disseminated.
- Where necessary lead (or arrange) school-based professional development meetings for colleagues.