



Science at Astwood Bank Primary School

Visions and Principles of science.

A Science Curriculum,
which develops learning of
science skills alongside a
questioning mind.

We aim to satisfy curiosity by
developing a curriculum which
encourages pupils to question
and learn through knowledge
and investigation.

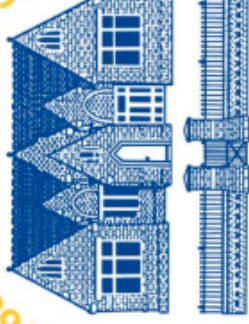
Pupils develop, model
and evaluate
explanations critically.

Pupils develop a sound knowledge of
key scientific concepts and an
understanding of their relevance in the
wider world.

Through practical investigations
pupils develop specific enquiry
skills which equip them to deal with
all types of investigations.

Pupils are given regular
opportunities to take science
beyond the classroom and learn
first-hand from trips, outdoor
lessons and sessions with visitors.

Astwood Bank Primary School



A centre of learning and opportunity

At Astwood Bank Primary School, our aim is to
teach science in a way that develops pupil
interest and curiosity about the world in which
they live. To foster a respect for their
environment and encourages children to ask
scientific questions and begin to appreciate the
way science will affect their future on a
personal, national, and global level.

Through use of scientific vocabulary
children can explain key concepts
and key findings fully.

Pupils use scientific methods to
collect evidence accurately.

Policy	Science
Last review	September 2023
Reviewed by	Mrs R. Glover



"The important thing is not to stop questioning. Curiosity has its own reason for existing."

Albert Einstein

This policy outlines what we are aiming to achieve in respect of pupils' Science education. It also describes our agreed approach to the implementation and assessment of the Science curriculum. The Science taught and the methods used reflect the recommendations outlined in the DfES guidance contained in the documents 'Early Years Foundation Stage Guidance' and 'The National Curriculum in England'.

Rationale

We live in an increasingly scientific and technological age in which it is essential that children feel equipped with knowledge, skills and attitudes to prepare them for life. We at Astwood Bank Primary School, believe that the teaching of science develops in children an interest and curiosity about the world in which they live. It fosters in them a respect for the environment and encourages children to ask scientific questions and begin to appreciate the way science will affect their future on a personal, national, and global level.

Vision

Astwood Bank Primary School is an innovative learning community, committed to excellence. We consider ourselves to be 'a centre for learning and opportunity'.

Curriculum Intent

- Our intention at Astwood Bank Primary School to continue to build a Science Curriculum, which develops the learning of science skills alongside a questioning mind about ways in which Science influences everyday life.
- Our investigative Science will encourage children to ask important questions about how things work and why things happen in a certain way. Ultimately, this will help all children to understand the world they are growing up in and provide them with life skills to better access it as well as becoming creative thinkers and adults who strive to seek solutions to problems and questions.
- Alongside scientific knowledge and the understanding of concepts, we hope that our children will develop curiosity and excitement about the natural world as well as use their skills to understand how Science can be used today and in the future.

Aims for our pupils

Our aims at Astwood Bank Primary School are to:

- Stimulate and excite pupils' curiosity about changes and events in the world.
- Satisfy this curiosity with knowledge and investigation.
- Engage pupils as learners at many levels through linking ideas with practical experience.
- Help pupils to learn to question and discuss scientific issues that may affect their own lives.
- Help pupils develop, model and evaluate explanations through scientific methods of collecting evidence using critical and creative thought.

- Show pupils how major scientific ideas contribute to technological change and how these impacts on improving the quality of our everyday lives.
- Help pupils recognise cultural significance of science and trace its development; linking with global citizenship develops a greater understanding of the world in which they live.
- Encourage children to present information in a variety of ways including drawings, diagrams, tables and charts and in speech and writing. At Key Stage 2 pupils will also use standard units of measurement and include graphs to record and present information
- Each pupil will undertake a course of study based on the National Curriculum 2013. The fundamental skills, knowledge and concepts of the subject are set out in "Science" in the National Curriculum document where they are categorized into four attainment targets: -
 1. Working Scientifically
 2. Life and Living Processes
 3. Materials and their Properties
 4. Physical Processes

Implementation of Science

At Astwood Bank Primary School we offer a broad and balanced curriculum which covers the EYFS recommendations in Reception (specifically Understanding the World) and all aspects of the National Curriculum England for year 1-6. Wherever possible we aim to ensure that lessons are delivered in a way that is relevant to real life and existing pupil experience, encouraging the development of children's scientific skills and understanding of scientific processes in purposeful enquiry. Embedded within each topic and alongside scientific Curriculum content, children are taught about the nature, processes and methods of science by working scientifically. Children are expected to develop specific enquiry skills through carrying out investigations and mastering the skill of:

- asking questions
- making predictions
- setting up tests
- observing
- measuring
- recording data
- interpreting and communicating findings
- evaluating investigations

Activities will inspire the pupils to experiment and investigate the world around them and to help them raise their own questions such as "Why...?", "How...?" and "What happens if...?". Activities will develop the skills of enquiry, observation, locating sources of information, selecting appropriate equipment (and using it safely), measuring and checking results, and making comparisons and communicating results and findings.

Pupils will have frequent opportunities to develop their skills in, and take responsibility for, planning investigative work, selecting relevant resources, making decisions about sources of information, carrying out activities safely and deciding the best way to communicate their findings.

Ensuring a broad curriculum

THEMES	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Autumn 1	Superheroes Seasonal change and weather forces	Seasonal change and weather (ongoing throughout the term)	Living things and their Habitats (Seaside)	Animals including humans	Autumn Watch	Earth & Space	The Digestive System
Autumn 2	Festivals Seasonal change and weather	Forest School Plants	Plant Growth (Homefront)	Famous scientists- Marie and Pierre Curie	Electricity	Earth & Space (forces and gravity)	Electricity
Spring 1	Traditional tales Materials and their properties	Material and their properties	Materials and their properties (Great Fire)	Forces and Magnets	States of Matter	Forces – levers and pulleys	The Circulatory System
Spring 2	Transport Friction and magnetism	Animals including humans	Scientific Enquiry (chocolate)	Light	Sound	Changing Materials	Light
Summer 1	Space	Material and their properties	Animals including Humans (Happy Healthy me)	Rocks and Soils	Habitats	Living Things and Their Habitats	Classification
Summer 2	Food and Farming Growing and healthy eating	Seasonal changes	Mini beasts & Food chains (local environment)	Plants	Teeth and Digestion	Animals including Humans	Evolution & Inheritance

At both Key Stage 1 and Key Stage 2, science is taught as a discrete curriculum area but in all classes, science will naturally draw from and contribute towards other areas of the curriculum; these cross-curricular opportunities are maximized wherever possible. Science teaching is kept relevant by building on pupils' own experience and using contexts from the local environment and the wider world. Teachers are aware that all pupils will begin a new topic at varied starting points. Through carefully engineered assessment opportunities, pupils' prior knowledge is established enabling future lesson content to be planned accordingly.

Astwood Bank Primary utilises the PLAN primary science resources to support the planning and assessment of the Science National Curriculum in England.

Plants

Early learning goal	<ul style="list-style-type: none"> Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur and talk about changes.
Year 1	<ul style="list-style-type: none"> Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. Identify and describe the basic structure of a variety of common flowering plants, including trees.
Year 2	<ul style="list-style-type: none"> Observe and describe how seeds and bulbs grow into mature plants. Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. Identify and name a variety of plants and animals in their habitats, including microhabitats. (Y2 - Living things and their habitats)
Year 3	<ul style="list-style-type: none"> Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant. Investigate the way in which water is transported within plants. Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.
Year 4	<ul style="list-style-type: none"> Recognise that living things can be grouped in a variety of ways. (Y4 - Living things and their habitats) Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. (Y4 - Living things and their habitats) Recognise that environments can change and that this can sometimes pose dangers to living things. (Y4 - Living things and their habitats)
Year 5	<ul style="list-style-type: none"> Describe the life process of reproduction in some plants and animals. (Y5 - Living things and their habitats)
Year 6	<ul style="list-style-type: none"> Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals. (Y6 - Living things and their habitats) Give reasons for classifying plants and animals based on specific characteristics. (Y6 - Living things and their habitats)
KS3	<ul style="list-style-type: none"> Reproduction in plants, including flower structure, wind and insect pollination, fertilisation, seed and fruit formation and dispersal, including quantitative investigation of some dispersal mechanisms.

(Extract from PLAN Progression in knowledge)

PLAN Progression in scientific skills (working scientifically)

skills stage	EYFS	KS1	Lower KS2	Upper KS2
PLAN	<ul style="list-style-type: none"> ➤ choose the resources they need for their chosen activities and say when they do or don't need help 	<ul style="list-style-type: none"> ➤ ask simple questions and recognising that they can be answered in different ways 	<ul style="list-style-type: none"> ➤ ask relevant questions and using different types of scientific enquiries to answer them ➤ set up simple practical enquiries, comparative and fair tests 	<ul style="list-style-type: none"> ➤ plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
DO	<ul style="list-style-type: none"> ➤ know about similarities and differences in relation to places, objects, materials and living things ➤ make observations of animals and plants ➤ explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function. ➤ select and use technology for particular purposes 	<ul style="list-style-type: none"> ➤ observe closely, using simple equipment ➤ perform simple tests ➤ identify and classify 	<ul style="list-style-type: none"> ➤ make systematic and careful observations and, where appropriate, take accurate measurements using standard units, use a range of equipment, including thermometers and data loggers 	<ul style="list-style-type: none"> ➤ take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
RECORD	<ul style="list-style-type: none"> ➤ represent their own ideas, thoughts and feelings through design and technology, art, music, dance, role play and stories 	<ul style="list-style-type: none"> ➤ gather and record data to help in answering questions. 	<ul style="list-style-type: none"> ➤ gather, record, classify and present data in a variety of ways to help in answering questions ➤ record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables 	<ul style="list-style-type: none"> ➤ record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
REVIEW	<ul style="list-style-type: none"> ➤ talk about the features of their own immediate environment and how environments might vary from one another ➤ explain why some things occur and talk about changes 	<ul style="list-style-type: none"> ➤ use their observations and ideas to suggest answers to questions 	<ul style="list-style-type: none"> ➤ report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions ➤ use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions ➤ identify differences, similarities or changes related to simple scientific ideas and processes ➤ use straightforward scientific evidence to answer questions or to support their findings 	<ul style="list-style-type: none"> ➤ use test results to make predictions to set up further comparative and fair tests ➤ report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations ➤ identify scientific evidence that has been used to support or refute ideas or arguments

Impact

We listen to our children, and frequent pupil interviews tell us it is evident that the children at Astwood Bank Primary are passionate about science and enjoy talking about what they have learnt and how they achieved this learning. They can use appropriate scientific vocabulary when talking about their learning and are confident in using a range of sources to prompt and support these discussions (e.g. science books, working walls). Children leave Astwood Bank with the enthusiasm to continue their science education at secondary school and are excited about the next stage in their science journey. By designing a progressive curriculum relevant to the children, we have ensured that children become confident in their own scientific ability and so

are able to make links within what they have learnt. Children at Astwood Bank enjoy science, and this results in motivated learners with sound scientific understanding.

Health and Safety

We aim to develop in children:

- An appreciation of the need for safe action in scientific exploration and investigation.
- The ability to handle materials and equipment with care.
- An awareness of the need for safety and responsible behaviour in everyday life.

It is the duty of all staff to take care for the health and safety of themselves and others, taking responsibility to plan safe activities in science. It is always up to the professional judgement of individual teachers to make specific risk assessments in relation to the lessons. Staff will also observe the guidance in "Be Safe Safety Booklet (located on the Staffroom Noticeboard) and all pupils will be frequently reminded About potential hazards and care of the equipment they are using. Any trips or visits should be planned with due regard to the Schools' Educational Visits Policy.

Assessment

Assessment for learning is continuous throughout the planning, teaching and learning cycle. Children are assessed 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.
- Observation of practical activities or other assessments (writing a leaflet or poem, creating a concept map)

In Science, as with other subjects, the teacher's questions and subsequent responses allow the teacher to assess where the children are and what scientific misconceptions they may have. Lesson sequences and content will then change to accommodate/address these areas to close gaps in knowledge. Assessment is made an integral part of lesson through use of Explorify, open questions (HOT questions) concept maps/cartoons/ KWLs. FORMATIVE ASSESSMENT

Astwood Bank Primary utilises the PLAN primary science resources to support the planning and assessment of the Science National Curriculum in England.

Response to Children's Work

At Astwood Bank Primary, we recognise the importance of feedback as an integral part of the teaching and learning cycle and aim to maximize the effectiveness of its use in practice. We recognise the importance of responding to children's work, whether orally or in writing. To ensure children are aware of their own achievements and areas of misconception, we adopt a 'Blue for Brill' and 'Pink for think' colour code when marking. Whenever necessary children are provided with purposeful prompts that will help to move learning forward. Frequently children are encouraged to be responsible for and to assess their own learning using a 'Purple polishing Pen' which allows teachers to assess pupil's understanding. The most valuable feedback will be given immediately in lessons; particularly with younger children and children will be given time to respond to feedback in lessons.

Children as individuals

In all classes there are children of differing abilities. We recognise this fact and provide suitable learning opportunities for all children by matching the challenge of the task to the ability of the child. We achieve this through a range of strategies – in some lessons through differentiated group work, and in other lessons by organising the children to work in pairs on open-ended investigations and analysis.

Equal Opportunities

At Astwood Bank Primary School we are committed to providing all children with an equal entitlement to scientific activities and opportunities regardless of race, gender, culture or class. We aim to meet the needs of all our children by differentiation in our science planning and in providing a variety of approaches and tasks appropriate to ability levels. 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. In all instances our work in science takes into consideration the targets set out in Individual Education Plans. Some children will require closer supervision and more adult support to allow them to progress whilst more able children will be extended through questioning. By being given enhancing and enriching activities, more able children will be able to progress to higher-level skills and knowledge appropriate to their abilities. In essence we provide the building blocks to ensure all pupils can thrive.

Special Educational Needs (SEND)

Most Science lessons are appropriate for all children since the teacher will differentiate as necessary for those children with specific needs. A liaison with the Special Needs Coordinator will sometimes be necessary. However, a pupil whose difficulties are severe, or complex may need to be supported by a special needs assistant in addition to appropriately differentiated tasks provided by the teacher. Our work in science considers the targets set out in the children's Individual Education Plan (IEPs). We take care to ensure that a child's ability in science is not limited by their ability to record; opportunities are provided for children to record in ways appropriate to their learning style, e.g. in pictures, photographs, mini clips, or an adult scribe when necessary.

Role of the Subject Leader

- To offer support and guidance for teachers when necessary, including CPD training for staff in effective delivery and assessment of science lessons.
- Leads the whole-school monitoring and evaluation of teaching and learning in science by observing teaching and learning in science regularly through pop-ins and lesson observations.
- Book looks and offer support with science planning to ensure good progression and challenge in science teaching across the school.
- Ensuring pupils and staff voice is heard through questionnaires and informal chats to improve and develop science within school.
- To take responsibility for managing own professional development by participating in external training and disseminating this to staff where necessary.
- To ensure that the school's senior leaders and governors are kept informed about the quality of teaching and learning in science.
- To work in close partnership with the school's senior leaders to ensure the learning needs of all pupils in science are met effectively.
- To keep the school's policy for science under regular review.