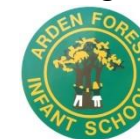


Science Purpose and Rationale

At Arden Forest our vision is to enable our whole school community with the skills to be happy, successful and independent life-long learners with healthy mind, bodies and spirit.

'Little Learners, Big Achievers'



Taken from Arden Forest vision statement and school motto.

Statutory Commitment

EYFS Framework – Science (Sept 2021)

Educational Programmes – Understanding the World

Understanding the world involves guiding children to make sense of their physical world and their community. The frequency and range of children's personal experiences increases their knowledge and sense of the world around them – from visiting parks, libraries and museums to meeting important members of society such as police officers, nurses and firefighters. In addition, listening to a broad selection of stories, non-fiction, rhymes and poems will foster their understanding of our culturally, socially, technologically and ecologically diverse world. As well as building important knowledge, this extends their familiarity with words that support understanding across domains. Enriching and widening children's vocabulary will support later reading comprehension.

KS1 National Curriculum – Science (2013)

The 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 knowledge required to understand the uses and implications of science, today and for the future

School Commitment

Our Curriculum Intent (Appendix A) identifies what opportunities and experiences our pupils have on entering our school. This also recognises what our pupils need in order that we fully enable our school vision. It maintains a fidelity to the new EYFS Statutory Framework and KS1 National Curriculum as well as a commitment to alignment across the two phases in our school.

Through our Science curriculum, we want to develop the children's sustained thinking skills in order that they can articulate their thoughts and ideas about the world around them. To provide real life experiences to enhance what they already know and how to build upon this knowledge.

Our Growth Mindset Learning Behaviours help children develop the right attitudes to Science in order that they fulfil their potential and experience success. E.g. valuing the need to be a stick-a-saurus and keep persevering when faced with challenge when carrying out an investigation or experiment, or a think-a-docus when considering the correct science vocabulary or even a Solv-a-tops to problem solve.

We are also committed to our carefully planned progression for guiding children to make sense of their physical world and their community, including children's personal experiences which increases their knowledge and sense of the world around them.

Within all aspects of Science, there are opportunities for pupils to develop their School Responsibilities' of being kind and respectful, learn and let others learn and keeping themselves and others safe.

Why do learners at Arden Forest Infant School need to study Science?

At Arden Forest Infant School, we recognise the importance of Science in every aspect of daily life which also supports our vision of inclusive practice. As one of the core subjects taught in schools, we give the teaching and learning of Science the prominence it requires.

"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." National Curriculum, 2013.

The Scientific area of learning is concerned with increasing pupils' knowledge and understanding of our world, and with developing skills associated with Science as a process of enquiry. It will develop the natural curiosity of the child, encourage respect for living organisms and the physical environment and provide opportunities for critical evaluation of evidence.

Therefore in our Science lessons children will be given the opportunity to have practical sessions where they will investigate or carry out an experiment. This will enable them to see for themselves and experience first-hand results and having the knowledge to explain how they have come to the conclusion, as well as having any misconceptions addressed.

How we promote personal characteristics and relationships?

At Arden Forest Infant School, the Science curriculum delivers a vast range of social, moral, spiritual and cultural aspects which reflects the school's Personal Characteristics and Relationships principles. It encourages the children to be responsible, show kindness, respect, positivity, tolerance and resilience. It encourages kindness and respect for one another as well as our relationships with others. It may also include teamwork where the children work collaboratively and practically to investigate and experiment which will need the attributes of tolerance when opinions differ, as well as thinking about safety for themselves and others.

Within Science children will often have opportunities to work responsibly, sharing resources and managing their tasks. Children are encouraged to support each other positively and respectfully and to peer assess and evaluate. This demonstrates respect and tolerance for each other and each other's contributions or work. Children are able to develop their self-esteem, self-knowledge and self-confidence to produce different response. Within Science children are encouraged to ask questions to consolidate their understanding and for misconceptions to be addressed. Together, children will experience challenge safely and understand that they can be resilient in response to changes in lessons or school.

What are the aims for the Science Curriculum? (What do we want learners to be able to know and do by the time they leave Arden Forest Infant School?)

When children leave the Early Years at Arden Forest Infant School they will have had opportunities to explore the natural world around them through observations and drawings. Know similarities and differences using their own experiences and what has been taught as well as understand some important processes and changes.

At Arden Forest Infant School, in conjunction with the aims of the National Curriculum, our science teaching offers opportunities for children to:

- 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;
- Be equipped with the scientific knowledge required to understand the uses and implications of Science, today and for the future.
- Develop the essential scientific enquiry skills to deepen their scientific knowledge.

- Use a range of methods to communicate their scientific information and present it in a systematic, scientific manner, including I.C.T., diagrams, graphs and charts.
- Develop a respect for the materials and equipment they handle with regard to their own, and other children's safety.
- Develop an enthusiasm and enjoyment of scientific learning and discovery.

Children should be able to engage in extended conversations or articulate their thinking including sustained thinking. They should be independent learners and able to show everyday application of skills in mathematics.

How does Science help our pupils to be aspirational lifelong learners?

Having good scientific knowledge and skills, including ability to think independently, to ask and answer questions about the world around them, to work collaboratively and practically and be able to reason scientifically will provide direct links to future employment. These opportunities will mean that our children will contribute to community and wider society, this might include careers in medicine, archaeologist, astronaut, astronomer, audiologist, laboratory work and research.

This includes, being able to use the skills flexibly, even for the jobs that don't yet exist!

Why has the specific knowledge been selected?

At Arden Forest Infant School the science curriculum is taught discreetly within KS1 and taught through a more integrated approach in EYFS. It is designed to help our children to think independently, to ask and answer questions about the world around them. It will enable them to question ideas and reflect on knowledge. To retain knowledge that is pertinent to Science with a real-life context. As well as being able to explain the process they have taken and be able to reason scientifically. It encourages our children to be life-long learners who are enthused, curious and inquisitive.

How is Science implemented?

The National Curriculum will provide a structure and skill development for the Science curriculum being taught throughout the school, which is linked, where possible to the theme topics to provide a creative scheme of work, which reflects a balanced programme of study.

Early Years uses the aspect of the Natural World to begin their scientific journey through exploration, observation and understanding.

At Arden Forest Infant School children have weekly lessons in Science throughout Key Stage 1. In Early Years, Science is taught through the children learning about the world around them in their learning through play. Additional opportunities are provided in science, such as 'science days/weeks' for children, educational visits linked to the Science curriculum, such as visits to Warwickshire Wildlife Trust based at Brandon Marsh, Ryton Pools, Plantasia, Coombe Abby and other Warwickshire Outdoor Educational sites across the county which enhances the children's learning in the classroom, along with the use of our own woodland area in our school grounds. We also embrace and actively seek opportunities from within our own local community, partner schools and outside agencies to add to our children's scientific knowledge and curriculum.

What is the impact?

The impact of our Science curriculum can be seen not only in our children's Science books but also through classroom displays our pupils' conversations and the school environment. Monitoring of Science ensures that standards in teaching and learning remain high. Data enables us to reflect on the intent of the Science curriculum and how it is being implemented, eg are our teaching strategies helpful. Regular analysis of pupil attainment and progress data also ensure outcomes from starting points follow an expected trajectory against the termly milestones as well as identify specific groups or individuals in need. This ensures children are on track during the year. Interventions provide opportunities for specific children to address any misconceptions. Our children are given a broad range of experiences in Science and have good access to outdoor spaces which enable a knowledge of the natural world around them as well as express their feelings and be unique.

Appendices:

- A. Overall School Curriculum Intent
- B. Science aims/end points of specific stages of curriculum
 - EYFS Framework and National Curriculum
- C. See Progression in Learning Framework for Science with overarching maps that show the sequence and progression in learning from the beginning of Reception until the end of Year Two.



Appendix A

Arden Forest Infant School – Curriculum Intent

What do we know about our community of learners? What opportunities/experiences have they had already and what have they not yet benefited from?

Our pupils start Reception from a large number of different pre-school settings. They have a diverse range of cultural and family backgrounds which are valued and shape our unique relationships with our school community.

Communication skills vary on entry, children are often reluctant to engage in extended conversations or articulate their thinking. Children often need support to identify and moderate their own feelings and are not able to solve minor disagreements.

We have an increasing percentage of children with additional needs compared to the national average, including those with ASD. As such, communication and language, physical development and personal and social and emotional development is significantly lower for these children. Recently, many children have not been able to access outside agency support due to COVID restrictions.

When our children begin Reception, they are often confident, show curiosity and are eager to explore their environment. However, our pupils' often lack sustained thinking and focus. Children are reluctant to be independent in their learning and life skills, and often their resilience and perseverance in the face of challenge is low which is a barrier to success. They lack experience of opportunities to take calculated risks.

Children typically have good access to outdoor spaces which enable a knowledge of the natural world around and gross motor skills to be typically at age related expectations. However, children's fine motor skills are typically not as developed.

Children generally access books and stories at home. However, the ability to blend and segment in phonics is a barrier for most children which impacts on their reading and writing on entry. Most parents generally take an active role as partners in their children's learning.

The majority of children show everyday application of skills in mathematics. Children usually have access to technology at home. Imagination is often good in small world and role play but children lack creativity and skill with music, art and design. We have observed that our children tend to have a limited cultural experiences of the arts or awareness of their wider community.

In September 2021, some children starting with us will have lived nearly half of their life with the pandemic. Our Year One children spent a third of their Reception Year Learning remotely and missed a significant part of their pre-school experience due to lockdown. Our Year Two children spent a third of their time in Year One being taught remotely and missed a significant part of their Reception Year due to lockdown.



Appendix B

Science aims/end points of specific stages of curriculum

EYFS Framework (September 2021)

ELG: The Natural World

Children at the expected level of development will:

- 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 some important processes and changes in the natural world around them, including the seasons and changing states of matter.

Science STA Teacher Assessment Framework at end KS1

Working at the expected standard

The pupil can, using appropriate scientific language from the national curriculum:

- ask their own questions about what they notice
- use different types of scientific enquiry to gather and record data, using simple equipment where appropriate, to answer questions:
 - observing changes over time
 - noticing patterns
 - grouping and classifying things
 - carrying out simple comparative tests
 - finding things out using secondary sources of information
- communicate their ideas, what they do and what they find out in a variety of ways.