

Bowlee Park Community School

Science Policy

Our School Motto; Knowledge... your passport to the world!

Bowlee Values - Respect, Kindness, Ambition, Resilience, Cooperation, Responsibility

British Values - Democracy, Rule of Law, Individual Liberty, Tolerance and Respect

Rights Respecting Schools - Article 28; 'Every child has the right to an education'

Bowlee Behaviour Principles – Be Ready, Be Respectful and Be Safe

1. Curriculum Intent

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, a high-quality science curriculum encourages pupils recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. It encourages children to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes.

Science National Curriculum, 2014

A Curriculum for Our Pupils

We are a large school in an area of significant deprivation. Many of our pupils come from homes where the challenges of low income and social deprivation have a significant impact on their scientific knowledge and capital. We are committed to securing equity and improving pupils' life opportunities. Therefore, we provide:

- a strong foundation in reading, writing, mathematics and communication skills underpins our science curriculum.
- a wide range of cultural experiences;
- a word-rich environment enhancing vocabulary and reading;
- a science curriculum based on the 'Kapow scheme' which ensures knowledge and understanding of the world around them;
- a knowledge of higher education and the wide range of training and employment opportunities in STEM which they can aspire to
- a science curriculum which nurtures all elements of well-being for our pupils

Our ambition in science is to ensure high achievement for all pupils, including disadvantaged pupils and those with SEND. In designing our curriculum, we have taken account of the wide-ranging social and economic backgrounds of our families. Our science curriculum accelerates pupils' acquisition of knowledge, skills and understanding. It ensures they can access and excel at an age-appropriate standard.

A Curriculum of Breadth and Wider Opportunity

At Bowlee Park, we ensure our science curriculum is a curriculum of breadth and ambition. We have ensured that our curriculum meets the needs of disadvantaged pupils and addresses gaps in their knowledge and skills. Our science curriculum delivers the EYFS Framework and statutory National Curriculum, and offers importance to all subjects. It includes strong links to maths, geography, English and the PSHE curriculum particularly when learning about how the body changes and sex education. High standards in the basic skills allow our pupils to achieve in all subjects.

We ensure that the curriculum allows for pupils' wider development. In previous years, children have represented the school in numerous science competitions and activities such as 'The Great Science Share' and the 'Primary Engineer' competition which aims to develop a passion for science and engineering in young learners. Activities such as these provide children with the chance to deepen their science knowledge and encourages their passion for science to thrive. Each year, there are opportunities for children to extend their science knowledge outside of the classroom through in school workshops, trips to science museums and visits to high schools to make use of equipment only found in laboratories. A science ambassador is democratically voted to represent each class at Bowlee Park. They champion science within their own classrooms and advocate pupil voice.

Progressive, Well-sequenced Learning that Embeds Knowledge

Our curriculum is based on the best research of how children learn most effectively. Learning is a change in long term memory. In designing our science curriculum these key elements are integral:

- small steps in teaching and exposition
- review of learning
- spaced practice
- retrieval of prior learning

Our curriculum is based on key constructs: knowledge, skills, progression and experience. Knowledge, together with skills and opportunities to apply learning, leads to strong progress.

Our science curriculum is systematic. There is logical progression of knowledge and skills in all units of work. Each program of study builds on knowledge from previous science learning. As a result, we deliver a consistent whole school approach to learning. In designing this curriculum, we have maximised opportunities for pupils to build on prior learning. Knowledge content is repeated and revisited to ensure pupils know more and remember more. We use knowledge organisers and quizzes to ensure prior learning is reviewed and the key knowledge is retained.

Bowlee Park follows the National Curriculum for science which sets out the statutory knowledge and programme of study for each year group. Our curriculum delivers progressive and cumulative knowledge acquisition. A secure grasp of knowledge helps pupils to make connections and leads to further learning. This is at the heart of the design of each unit of study. Topics are carefully placed so that they are progressive and children are given opportunities to link their knowledge to the world around them – e.g. teaching about plants in spring.

Our plans detail the knowledge pupils will learn and how this knowledge develops through the units studied. As pupils develop knowledge, they need to practice and master skills to

allow them to apply this knowledge in a wide variety of contexts. Our curriculum prioritises key skills and ensures these can be applied in real contexts. The learning of academic and scientific language is embedded across school. Key vocabulary is identified on subject planning, knowledge organisers and displays. This language is used and reviewed within science lessons.

High quality learning experiences are important in the delivery of our curriculum. These experiences provide a meaningful and memorable context to learning. Trips, visitors and enrichment activities are integral to learning and enhance pupils' engagement. These opportunities enrich learning for our pupils and increase their science capital, many of whom come from disadvantaged backgrounds.

A Curriculum where Reading is a Priority

Reading has the highest priority at our school. It enables pupils to access the full curriculum. Our science curriculum gives children opportunities to apply reading skills taught in English lessons particularly through the range of non-fiction texts children are exposed to. Each topic is also linked to a high quality text (fiction or non-fiction) that is shared with pupils as part of the topic. We also ensure that there are linked comprehensions, where possible, so that children are exposed to science knowledge in a range of contexts such as biographies of key figures.

A Curriculum that Develops Core Values

Pupils know and understand our Bowlee values. They know and understand our British values. Our science curriculum enables pupils to develop into confident learners who are able to work with others. Our clear focus on developing children's working scientifically skills through practical opportunities develops children's ability to collaborate and develop their resilience. It provides them with the knowledge and science capital to become well-informed citizens, able to appreciate human creativity and achievement. As they learn more, they develop an understanding of the community to which they belong. The curriculum includes the UNICEF Rights Respecting Schools Programme, as part of the work which ensures that pupils will be able to contribute towards building a better world. Our 'Pupil Passports' motivate children to engage in a wide range of character-building activities, helping them to develop their knowledge and skills including scientific outdoor learning.

The role of science ambassadors also provide children with further opportunities to develop their confidence in communicating with a large range of audiences such as participating in the Great Science Share at the University of Salford where they demonstrated and explained an investigation they had designed. Science teaching offers children many opportunities to examine some of the fundamental questions in life, e.g. the evolution of living things and how the world was created. Through many of the amazing processes that affect living things, children develop a sense of awe and wonder regarding the nature of our world. Science raises many social and moral questions. Through the teaching of science, children have the opportunity to discuss, for example, the effects of smoking, and the moral questions involved in this issue. We give children the chance to reflect on the way people care for the planet, and how science can contribute to the way in which we manage the Earth's resources. Science teaches children about the reasons why people are different and, by developing the children's knowledge and understanding of physical and environmental factors, it promotes the Bowlee and British values.

Science Curriculum Planning

Science is a core subject in the National Curriculum. Bowlee Park uses the National

Curriculum for science as the basis of its curriculum planning and the Kapow scheme of learning. This has been adapted to the local circumstances of the school in that we make use of the local environment in our fieldwork.

We carry out our curriculum planning in science in two phases – a long-term overview and unit plans for each topic. The long-term plan maps the scientific topics studied in each term during the Key Stage highlighting links to learning from topics taught in previous years. The science team works this out in conjunction with teaching colleagues in each year group.

Our unit plans show the sequence of lessons and the short term plans detail the lesson. They include a recap and recall of key information, the main teaching and key questions. They also identify key vocabulary, misconceptions and assessment points for each lesson.

There is also a focus on working scientifically within the unit plans so that pupils so that pupils are exposed to high-quality modelling of each scientific skill. Where appropriate, lessons are linked to a particular scientific objective so that pupils can practise the skills they need to work scientifically. The science team monitor planning to ensure that throughout the year all children experience every working scientifically objective. We also ensure a range of scientific enquiry types, which includes: observing over time; pattern seeking; identifying, classifying and grouping; comparative and fair testing and researching using secondary sources. Pupils should seek answers to questions through collecting, analysing and presenting data.

Teachers work as year group teams to plan with the support of the science team. This enables them to share expertise and reduces the workload for individual teachers, thus supporting a good work life balance.

The Foundation Stage

We teach science in foundation stage classes as an integral part of the 'Understanding of the world' aspect of Development Matters. Throughout the year it is introduced indirectly through activities that encourage every child to explore, problem solve, observe, predict, think, make decisions and talk about the world around them. We make clear links between the knowledge and skills they learn throughout Foundation Stage and what they will learn in Year 1. The Nursery topic 'What Makes me, Me!' and the Reception topic 'All About Me' which cover aspects such as names of bodies parts and how they change and grow clearly link to the first Year 1 unit 'My Body' where children identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. Science makes a significant contribution to developing a child's knowledge and understanding of the world but it also links with other key areas of learning including mathematics and communication and language.

Ambition and Access to the Science Curriculum

At Bowlee Park Primary School all children have an entitlement to a broad and balanced curriculum, which is differentiated to enable out children to:

- understand the relevance and purpose of all learning activities;
- experience levels of understanding and rates of progress that brings feelings of success and achievements;
- maximise achievement for all pupils, including pupils with Special Educational Needs and Disabilities (SEND) and children whose first language is not English, by addressing barriers to learning.

The majority of children access age appropriate objectives through adaptive teaching. For

all pupils (including those with SEND), teaching is adapted through a range of strategies including: breaking down learning into smaller chunks; adult support; reframing of questions; use of concrete and visual resources. Some pupils with significant cognitive delay require learning to be further differentiated and they access well-structured programmes. Pupils with SEND enjoy a full curriculum and make strong progress.

We enable all pupils to access the full range of activities involved in learning science. Where children are to participate in activities outside the classroom (a trip to a science museum, for example), we carry out a risk assessment prior to the activity, to ensure that the activity is safe and appropriate for all pupils.

Equality for All

At Bowlee Park Primary School we are committed to promoting equality of opportunity, eliminating discrimination and harassment, valuing diversity and promoting positive relationships. We meet the requirements of the Equality Act 2010 and provide an inclusive education to enable all pupils to develop their full potential.

Our school delivers a broad and balanced curriculum for all pupils and we address individual needs irrespective of gender, ability, religion or ethnic origin. The curriculum avoids stereotypes and provides good role models for all pupils. We ensure the curriculum is not delivered in a discriminatory way.

2. Curriculum Implementation

Science Provision/Teaching and Learning

We provide our pupils with a first class education. High quality plans support high quality teaching. Teachers deliver challenging and engaging science lessons. High quality professional development ensures teachers and teaching assistants have strong subject knowledge. Staff have continuous access to 'Reach Out CPD' to support them with their science planning and teaching and Kapow has teacher videos and teaching notes to support staff to deliver lessons.

The science team is passionate about scientific learning across school. They know how pupils develop their knowledge and skills from study unit to study unit and from year to year. They provide support and training for teachers. They review curriculum plans and check the quality of pupils' learning.

Effective pedagogy for teaching and learning is embedded across the school. Leaders check, model and support teachers in class ensuring consistency. Teachers use carefully chosen strategies to:

- present information clearly enabling pupils to understand key concepts;
- check pupils' understanding, identify and correct mistakes and misconceptions;
- ensure that pupils embed key concepts in their long-term memory and apply them fluently;
- deliver the subject curriculum in a way that allows pupils to transfer key knowledge to long-term memory;
- sequence learning so that new knowledge and skills build on what has been taught before and pupils work towards defined end points;
- assess pupils' understanding in order to inform further teaching, and to help pupils embed and use knowledge fluently;
- enable pupils to develop their understanding and link prior knowledge to new

learning;

- where it is required, teaching is adapted to meet the needs of children with SEND;
- lessons are delivered so that there is a carefully sequenced journey through the concept being taught building through small progressive steps;
- where each lesson sits within a child's journey through a specific topic, or more importantly, within the knowledge children will gain during their time at Bowlee Park, is shared with children at the beginning of lessons to reinforce previous learning and show how this will be built upon in future lessons;
- children are taught through whole-class interactive teaching, where the focus is on all children working together on the same lesson content.

Resources

We have sufficient resources for all science teaching units in the school. We keep these in a central store, where equipment is categorised. The resources allocated to each unit of work are audited regularly to ensure they are in good condition and still the most effective resource for supporting the children's learning. Each class also has a set of science books to be used as a teaching and learning tool and the library contains a good supply of science topic books. In addition, there are a range of published materials to support the delivery of high quality science teaching in all year groups, which link to the long and medium term plans.

ICT based resources are used by children to support individual research and investigations such as data loggers and iPads.

Each classroom has a science display relating to current work. Science displays are updated regularly to reflect the pace of learning. Displays include: books related to the topic, types of enquiry poster, knowledge organisers, key vocabulary, children's work, visual prompts and questions to develop working scientifically.

3. Curriculum Impact

Assessment in Science

Teachers use a range of formative assessment approaches to ensure that pupils embed and retain knowledge. They help teachers to plan the next sequence of teaching, and provide next steps for pupils. We collect summative data three times each year. This is in line with The Teacher Advisory Workload Report – 'Making Data Work'.

A judgement of a child's science ability is made based on a combination of a child's topic specific science knowledge, assessed through teacher observations and end of unit tests, and the child's ability to apply their working scientifically skills with an age appropriate level of independence. Termly assessments of a child's science ability are completed and recorded using Target Tracker.

Substantive Knowledge

Substantive knowledge is assessed through end of unit tests. At the end of each topic, children will complete the relevant multiple choice questions for the Kapow unit as well as a longer question that tests their understanding of a concept. The knowledge skills catcher can also be used to help inform teacher judgement.

Disciplinary Knowledge

Disciplinary knowledge is assessed each term. A child's ability to work scientifically will be assessed by the teacher based on observations of a child's science work in lessons and in

the enquiries they complete. The end of year expectations for working scientifically for each year group are shared with staff and are based on the National Curriculum expectations. To be assessed as working at an age-appropriate level for science, children need to demonstrate a secure understanding of the substantive knowledge and the ability to apply these working scientifically skills with an age-appropriate level of independence/support.

Leaders check the impact of the curriculum using qualitative and quantitative data. We monitor attainment and progress. We gather other data and information through a wide range of self-evaluation activities.

Monitoring and Review

The quality of teaching and learning in science is monitored and evaluated by the headteacher, senior leaders and the science team as part of the school's agreed cycle of monitoring. This cycle includes:

- planning scrutiny and work scrutiny
- lesson observations
- interviews with teachers
- discussion with pupils
- assessment data analysis and pupils progress meetings
- action planning to develop science curriculum development and teaching and learning based on the outcomes of monitoring.

The Role of the Subject Leader/Science Team

- Ensures teachers understand the requirements of the National Curriculum and teaching and learning is in line with this document.
- Prepares a subject action plan and meets regularly with the designated senior leader and the science link governor to discuss progress and outcomes.
- Monitors and evaluates science provision in the school by conducting regular planning scrutiny, work scrutiny, lesson observations, interviews with teachers, discussion with pupils and assessment data analysis.
- Organises and leads CPD and joint professional development.
- Observes colleagues with a view to identifying the support they need.
- Attends appropriate CPD.
- Keeps parents informed about science.

This policy will be reviewed at least every two years.

Next review date: March 2027