

Ballifield Primary's Science Curriculum



**“ The important thing
is to never stop
questioning. ”**

Albert Einstein

**MADE
FOR
SCHOOL**
by LWR since 1922

Context

- Ballifield Primary School is a large urban primary school, serving children in the age range of 3-11 years.
- The families that we serve are diverse in ethnicity, education and affluence.
- The area around Handsworth is developing quickly with large 'Advanced Manufacturing' businesses setting up at the Advanced Manufacturing Park just over a mile away from our school. Some of our children's parents and carers work for these businesses.
- As of September 2024, we are using White Rose Education as a basis for the planning and delivery of our science learning.

OUR INTENT FOR THE TEACHING OF SCIENCE AT BALLIFIELD PRIMARY SCHOOL

Aim

Our Science curriculum intends to provide the foundations for understanding the world through **biology**, **chemistry** and **physics** to all children, especially disadvantaged pupils, those with SEND, those who are known (or previously known) to children's social care, and those who may face other barriers to their learning and/or well-being. We promote **curiosity** and **excitement** about how our world works. The sequence of units builds children's knowledge and understanding of scientific **concepts** through **enquiry** and **practical** tasks.

Purpose

At Ballifield, we believe that:

- ✓ Science nurtures pupils' natural curiosity and helps develop enquiring minds.
- ✓ Practical experiments and investigations in science teach pupils the importance of accuracy and problem-solving.
- ✓ In science, pupils learn about the importance of scientific evidence and how to make sense of it.
- ✓ Science helps pupils develop the skills to think critically, solve problems and make decisions.

OUR IMPLEMENTATION OF THE TEACHING OF SCIENCE AT BALLIFIELD PRIMARY SCHOOL

The School Curriculum Requirements

As a maintained school in England, Ballifield Primary School is legally required to follow the statutory national curriculum which sets out a programme of study, on the basis of key stages, and subject content for the subject of Science that should be taught to all pupils.

Time allocation for Science

The amount of time allocated to the teaching of Science at Ballifield Primary School is a minimum of 1 hour per week. Teachers may also block longer sessions (e.g. 2 hours) to allow for practical work, investigations or whole-unit coverage, ensuring sufficient depth of study as recommended in the National Curriculum and White Rose small steps planning.

Which aspects of science are taught?

Biology: Topics such as human biology (body systems, nutrition, health), animal biology (habitats, life cycles, adaptations), plant biology (growth, photosynthesis, reproduction), and ecology (habitats, food chains).

Chemistry: Basic principles of chemistry such as states of matter, changing states, materials, and the properties of materials.

Physics: Fundamental concepts like forces (pushes, pulls, gravity), energy (sources, transfer, conservation), light and sound (reflection, refraction, vibration), electricity (circuits, conductors, insulators), and magnetism.

Working Scientifically: Learning how to conduct experiments, make observations, record data, and draw conclusions. This includes understanding the scientific method and developing scientific reasoning skills.

Links are made with other foundation subjects with children linking their learning about the seasons and environments with their geography learning and also timetabling RSHE lessons around growing up, puberty and reproduction to match up with their science lessons which reflect the same topics.

Teaching and Learning

The teaching and learning of Science at Ballifield Primary School is covered through all year groups and across both Key Stages.

Key Stage 1

The principle focus of science teaching in Key Stage 1 is to:

- Enable pupils to experience and observe, looking more closely at the natural and human made world around them.
- Encourage the children to be curious and ask questions about what they notice.
- Help children 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.
- Allow the children to 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 should be done through the use of first-hand practical experiences, there will also be some use of appropriate secondary sources, such as books, photographs and videos.

'Working scientifically' is described separately in the programme of study, but must always be taught through and clearly related to the teaching of substantive science content in the programme of study.

Pupils should read and spell scientific vocabulary at a level consistent with their increasing word reading and spelling knowledge at Key Stage 1.

Lower Key Stage 2

The principal focus of science teaching in lower key stage 2 is to:

- Enable pupils to broaden their scientific view of the world around them.

- Explore, talk about, test and develop 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.
- Enable children to 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.
- Allow children to draw simple conclusions and use some scientific language, first, to talk about and, later, to write about what they have found out.

'Working scientifically' is described separately at the beginning of the programme of study, but must always be taught through, and clearly related to, substantive science content in the curriculum. Pupils should read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge.

Upper Key Stage 2

The principal focus of science teaching in upper key stage 2 is to:

- Enable pupils to develop a deeper understanding of a wide range of scientific ideas.
- Explore and talk 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 should 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 should 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.

'Working and thinking scientifically' is described separately at the beginning of the programme of study, but must always be taught through and clearly related to substantive science content in the programme of study.

Pupils will also be taught to read, spell and pronounce scientific vocabulary correctly and use it to communicate their knowledge and understanding.

Planning

- Long term plans set out the clear sequencing and coherence of the Science curriculum across each year group for the academic year.
- Class teachers ensure that the Science curriculum is fine tuned appropriately to their current class of children, especially disadvantaged pupils, those with SEND, those who are known (or previously known) to children's social care, and those who may face other barriers to their learning and/or well-being. They ensure that lessons are accessible to all and children have the correct support for them to succeed.
- Teachers identify opportunities for both facilitating and extending learning, such as educational visits and visitors as well as learning outside the classroom.

- Medium term plans set out a coherent and well-sequenced series of lessons for each unit of work. These break units of learning into 'small steps' which build sequentially from lesson to lesson.

Science Resources

- Resources are stored in 'The Tardis', in orange boxes labelled with their contents.
- Teachers make good use of resources to ensure learning and understanding is of the highest quality.
- All consumable resources are replenished annually to ensure every child gets the same quality of learning.
- Resources can be requested from the Science leader by teachers. This must be done as early as possible to ensure resources are available when needed.
- Electronic resources are also used to enhance learning where appropriate, including BBC Teach and Explorify.

Visits and Visitors

Ballifield Primary School understands the importance of visits and visitors to our pupils' experience of Science. We aim to arrange at least 1 visit or visitor in each key stage phase. Building links with the Sheffield University Advanced Manufacturing and Research Centre (AMRC) and STEM ambassadors is a key development aim before the next curriculum review.

Inclusion

We understand that the most effective inclusion strategy begins with high-quality inclusive science teaching, which benefits all pupils, especially disadvantaged pupils, those with SEND, those who are known (or previously known) to children's social care, and those who may face other barriers to their learning and/or well-being. Teachers are aware that pupils who have barriers to learning in other areas may have a strong interest in and aptitude for science. We also recognise that strong foundations in communication, language, reading, writing and maths will aide pupils to access our science curriculum more fully. Adaptive teaching methods will be put into practice to support all pupils. Teachers also recognise that pupils' work and learning outcomes can take many forms. Pupils who are very knowledgeable in science are given opportunities to demonstrate and develop their knowledge and strengths.

EYFS

In the EYFS at Ballifield, Science sits within the area of "Understanding the World". Children are encouraged to explore and investigate the world around them, including natural and physical phenomena. Science activities and experiences are designed to foster children's curiosity, critical thinking, and understanding of the world through hands-on exploration, observation, and experimentation.

In the EYFS, science learning often involves activities such as exploring nature, observing changes in the environment, experimenting with materials, investigating simple scientific concepts (e.g., floating and sinking, magnets, plants), and learning about living things.

The goal of science education in the EYFS is to lay the foundation for later scientific understanding and inquiry by nurturing all children's natural curiosity and helping them develop essential skills such as questioning, predicting, observing, and problem-solving.

Science and SMSC

At Ballifield, we believe that Science plays a key role in the personal development of children developing team work and problem-solving skills. It also allows children to think independently, use their previous knowledge to make predictions and build resilience when experiments or practical tasks don't always go as planned.

Science and British Values

At Ballifield, we promote the fundamental British values of:

1. **Democracy**
2. The **rule of law**
3. **Individual liberty**
4. Mutual **respect**
5. **Tolerance** of those with different faiths and beliefs

We believe that Science can make a key educational contribution to children's explorations of British Values:

Democracy

In the Science classroom we learn through our lessons to take into consideration the views and opinions of others. We take turns and instructions from others.

The Rule of Law

In our Science lessons we learn and understand the importance of following safety rules when working scientifically. Science lessons help children to understand the consequences of their actions, which in turn helps them to apply this understanding to their own lives.

Individual Liberty

In Science we learn to confidently share our own opinions and ideas and respect the opinions of others. Within our lessons, pupils are encouraged to make their own choices when planning an investigation and recognise that others may have different points of view.

Mutual Respect

When learning and investigating during Science lessons we work as a team, supporting each other and sharing ideas and opinions. We discuss our findings and respect each other's work - through this we offer support and advice to others.

Tolerance

Through lessons and discussion, we look at scientific discoveries which have come from other cultures and how religious beliefs often compete with scientific understanding. We learn to be respectful of these beliefs and to appreciate and understand them

Health & Safety (CLEAPSS)

It is important that children are taught the rules of safety when undertaking experiments and investigations. Materials and equipment need to be handled safely. The teacher needs to ensure that all staff and pupils involved are aware of safety implications connected with any science activity they are undertaking. Teachers must also consider looking at CLEAPSS – of which the school is a member – for advice on safety when carrying out activities.

Doing Things Safely (cleapss.org.uk) <https://primary.cleapss.org.uk/Resources/Doing-Things-Safely/>. This is then added to medium term plans for future reference.

THE IMPACT OF THE TEACHING OF SCIENCE AT BALLIFIELD PRIMARY SCHOOL

The impact of our science curriculum will be that our children will view science as a subject that is engaging and enjoyable which fosters a love of Science and an appreciation of the world around them.

- Teachers will have the confidence and knowledge to deliver a well-planned and interesting curriculum to pupils using a range of resources and approaches.
- Pupils will make good progress in their acquisition of skills, knowledge and conceptual understanding.
- Children will feel empowered to pursue Science and STEM subjects as a potential career path, regardless of gender, ethnicity, socio-economic backgrounds etc.
- Children will access a range of different learning opportunities, both in and out of the classroom.

Assessment, reporting and monitoring

- Throughout units of learning, teachers recap and review previous learning.
- Gaps are filled before new knowledge is taught and AfL is used constantly to ensure children know more, remember more and can do more in science.
- End of block assessments, alongside teacher observations, questioning and work in books, are used to make judgements on children's attainment in science. Teacher assessment is carried out continuously through AfL and reviewed formally at the end of each unit and key stage.
- Children's attainment is judged against 'crucial knowledge' statement at the end of each half term's learning.
- Pupils' attainment in science throughout the school is tracked and monitored by the Subject Leader in order to ensure that science provision at Ballifield is impactful. The Subject Leader will also be able to identify areas for development and children who are finding it difficult to achieve the crucial knowledge statements. Through discussion with teachers, ways to further support children to meet the learning outcomes are devised.
- As required by law, we report pupils' attainment in science in written form to parents once a year, specifying whether their child has met the learning outcomes taught through our science curriculum.

Role of the Subject Leader

The Subject Leader is responsible for overseeing teaching and learning in Science at Ballifield. This role includes:

- Monitoring the standards of children's work.
- Supporting colleagues in their teaching.
- Keeping informed about current developments in the subject, and providing a strategic lead and direction for science in school.
- Monitoring the budget, resources, and science topics.
- Using specially-allocated time for fulfilling the task of reviewing samples of children's work, training, liaising with other subject leaders from other schools and attending Science leader network meetings.

Policy date: January 2026

Policy review date: January 2027