Ladywood

Primary School

Science Policy

June 2023

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Science curriculum intent

The intent of the Science Curriculum is to excite and stimulate pupils' curiosity about phenomena and events in the world around them, to prepare our pupils for life in an increasingly scientific and technological world. We intend learning in science to be through investigations of the physical, chemical and biological aspects of their lives that rely mainly on first hand experiences, leading to them being equipped to answer scientific questions about the world around them.

Aims and objectives

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

- To develop lively, enquiring minds and the ability to question.
- To learn scientific skills and knowledge.
- To build on their natural curiosity and enable them to understand and care for the world in which they live.
- To use equipment safely and sensibly.
- To develop the potential scientific links with all other areas of the curriculum.
- To develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics.
- To 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.
- To develop a positive attitude to science learning and its relevance in their lives.
- To be equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.

Implementation

In Ladywood Primary School we base our teaching on the 2014 National Curriculum Programmes of Study and this is particularly helpful with ensuring that there is continuity and progression. We have based our own science curriculum around this.

Curriculum organisation

The four main branches of scientific learning are:

- AT1 – experimental and investigative science (investigating)
- AT2 – life processes and living things (Biology)
- AT3 – materials and their properties (Chemistry)
- AT4 – physical processes (Physics)
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EYFS

The EYFS in Reception and nursery sets out the learning objectives for the seven areas of learning:

- Physical Development
- Expressive Arts and Design
- Personal, Social and Emotional Development
- Literacy
- Understanding of the World
- Communication and Language.
- Mathematics

The EYFS aims to give the children knowledge and skills so they can begin the National Curriculum. The children will access aspects of science in all areas of the curriculum, but mainly in understanding of the world. This is the area of learning where children are developing the knowledge, skills and understanding which enable them to make sense of the world. This forms the early experiences, investigations and discussions that will later develop the children's scientific knowledge and thinking.

KS1 AND 2

At Ladywood, Science is taught as a discrete lesson and as part of cross-curricular themes when appropriate. Science has links with other areas of the curriculum including Geography, English, Numeracy, Art and Design Technology.
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.
The area of working scientifically is not a discrete area so runs through every science topic in our school. Teachers plan questions to investigate in every topic

to extend children's understanding of this area and are encouraged to include STEM activities in their science planning.
Scientific vocabulary is an essential aspect in our science curriculum and pupils should be familiar with, and use, technical terminology accurately and precisely. They should build up an extended specialist vocabulary.

Year 1	Autumn	physics- seasonal change, Biology - animals including humans
	Spring	Chemistry – everyday materials
	Summer	Biology - plants
Year 2	Autumn	Biology – animals, including humans Biology -all living things and their habitats
	Spring	Chemistry – everyday materials
	Summer	Biology - plants
Year 3	Autumn	Physics – forces Chemistry - rocks
	Spring	Biology - plants
	Summer	Biology – animals including humans Physics - light
Year 4	Autumn	Chemistry -states of matter
	Spring	Physics – electricity Physics - sound
	Summer	Biology-all living things and their habitats Biology – animals including humans
Year 5	Autumn	Physics – earth and space Physics - Forces
	Spring	Chemistry – properties and changes in materials
	Summer	Biology-all living things and their habitats Biology – animals including humans
Year 6	Autumn	Biology – evolution and inheritance Biology – all living things and their habitats
	Spring	Physics – light Biology – living things including humans
	Summer	Physics -Electricity

Teaching and learning

Children are encouraged to ask questions and be given opportunities to use their scientific skills and research to discover the answers. This curiosity is celebrated within the classroom. Teachers ask a range of questions which enable all children to take part, listening carefully to answers and taking learning forward, using open and closed questions and allowing children time to think. Planning involves teachers creating engaging lessons, often involving high-quality resources to aid understanding of conceptual knowledge. Teachers try to include as much hands on learning in this subject as possible.

Teachers use precise questioning in class to test conceptual knowledge and skills, and assess pupils regularly to identify those children with gaps in learning, so that all pupils keep up. New vocabulary and challenging concepts are introduced through direct teaching. This is developed through the years, in-keeping with the topics. The science curriculum ensures that children are provided with regular opportunities to apply their mathematical knowledge to their understanding of science, including collecting, presenting and analysing data.

Working Scientifically

Working Scientifically skills are embedded into lessons to ensure these skills are being developed throughout the children's school career. Teachers demonstrate how to use scientific equipment, and the various Working Scientifically skills in order to embed scientific understanding. Teachers find opportunities to develop children's understanding of their surroundings by accessing outdoor learning and workshops with experts.

Expectations of working scientifically in each year group

In year 1, children will ask questions and set up tests to find the answers. They can use measures up to their mathematical knowledge. They will be able to explain what the have learned from this
In year 2, children will ask questions and use equipment, such as thermometers and rain gauges to observe environmental change. They will use microscopes to look at creatures and plants. They can set up a fair test and draw conclusions to explain what they have found out. They can use measures up to their mathematical knowledge They will draw conclusions from their fair tests and explain what they have found out. They can group and classify things when given a criteria.
In year 3, children will ask questions, observe and set up tests fair tests with different variables. They will be able to explain why it is a fair test and will use equipment to measure their results. They will be able to use

thermometers and know that there are two main scales. They will gather and record information using charts or tallies and can use keys with these. They will be able to present findings confidently orally and in written form with diagrams when needed. They will understand that sometimes predictions need to be changed.
In year 4, children will ask questions and use research to answer them. They will make predictions and give plausible reasons to why they think this and change these if necessary. They will set up and carry out fair tests, measuring carefully, using the correct equipment. They will gather and record information in charts (including bar charts) and tallies, deciding which is the most sensible. They will group information according to common factors, make sense of findings and draw conclusions from this, which is presented confidently orally and in written form. They are able to write up findings using a planning, doing and evaluating format.
In year 5, children will be able to decide if an investigation is needed, taking account of what has been learned previously, and create an enquiry based investigation if it is. They can make predictions, using knowledge from previous investigations. They will make it a fair test, with different variables, which can be isolated. They will use a range of scientific instruments and measurements to record and present data in a range of ways (including keys, labels, tables, scatter graphs, bar and line charts) as well as the use of IT. They will be clear about what has been found and can relate this to other enquiries when needed. They can give explanations clearly, have a wide and ongoing scientific vocabulary as well as carrying out research on scientific theory.
In year 6, children will know which type of investigation is needed to be carried out and will set up an enquiry based investigation. They will make accurate predictions and create new investigations from these. They will set up a fair test, know what all the variables are and justify why that variable has been isolated. They will choose and use a range of scientific instruments to measure and record data, presenting them in a range of ways of their choosing, including IT. They will use a range of written methods to report findings and set out explanations clearly, using a wide and ongoing scientific vocabulary and be aware that they need evidence and research to support their conclusions, which they routinely do.

Impact

Children's progress is continually monitored throughout their time at Ladywood Primary School and is used to inform future teaching and learning. By the end of each key stage, pupils are expected to know, apply and understand the knowledge, skills and processes specified in the relevant programme of study as set out in the National Curriculum. These are set out as statutory requirements. Children receive effective feedback through teacher assessment, both orally and through written feedback in line with the learning objective. Assessment for learning is continuous throughout the planning, teaching and learning cycle. Children are more formally assessed at the end of each topic in KS1 and KS2 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.

It also ensures a focus on the key identified knowledge of each topic, which is mapped within and across year groups to ensure progression. At the end of each blocked science topic, this key knowledge is checked and a formal science tracker is kept for each year.

Inclusion

We ensure that all pupils have access to a broad and balanced curriculum. Staff work towards removing barriers to learning and participation.
Children's recording will take many forms according to the nature of the activity:

- Verbal
- Pictorial
- Written
- I.C.T.
- Photographic

The Role of the Science Co-ordinator:
It is the responsibility of the co-ordinator to:

- To review changes to the National Curriculum requirements and advise on their implementation.
- Attend relevant CPD courses for Science as appropriate in line with the School Development plan.
- Monitor the learning and teaching in Science and provide support for staff when necessary.
- Actively promote science in the school.
- Carry out an annual audit of the school's Science resources.

This policy will be reviewed by the science coordinator biannually.