

Uplands Junior School Science Policy 2020

Science is one of the core subjects in the national curriculum. This policy outlines the purpose, nature and management of the science taught at Uplands Junior School. **This policy has been written with the UN Conventions on the Rights of the Child: article 3 (best interests of the child), article 28 (right to an education) and article 29 (goals of education).**

The implementation of this policy is the responsibility of the Science Subject Co-ordinators, Head Teacher and all the teaching staff.

1. Teaching and Learning

Intent

The 2014 National Curriculum for Science aims to ensure that all children:

- 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 skills required to understand the uses and implications of science, today and for the future. We understand that it is important for lessons to have a skills-based focus, and that the knowledge can be taught through this

At Uplands, we encourage children to be inquisitive throughout their time at our school and beyond in the wider world. The Science curriculum promotes a healthy curiosity in all children about our universe and encourages respect for the living and non-living things. This is in line with our Respect For All school motto. At Uplands we believe science encompasses the acquisition of knowledge, concepts, skills and positive attitudes. Throughout the programmes of study, the children will acquire and develop the key knowledge that has been identified within each unit at Key Stage 2, as well as the application of scientific skills. We ensure that the Working Scientifically skills are built-on and developed throughout children's time at the school so that they can apply their knowledge of science when using equipment, conducting experiments, building arguments and explaining concepts confidently and continue to ask questions and be curious about their surroundings.

Implementation

All teachers create a positive and engaging attitude to science learning within their classrooms and reinforce an expectation that all children are capable of achieving high standards in science. Our whole school approach to the teaching and learning of science involves the following;

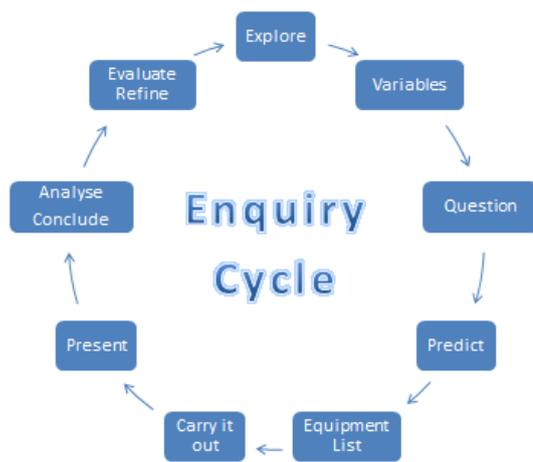
Science will be taught in planned and arranged topic blocks by year group teams and delivered by the class teacher or cover teacher working through the Enquiry Cycle. The Science leader has an overview of the whole school and each year group team know when each topic is to be taught.

Through our planning, we involve problem solving opportunities that allow children to find out for themselves. Children are encouraged to ask their own questions and be given opportunities to use their scientific skills and research to discover the answers. This curiosity is celebrated within the classroom. Planning involves teachers creating engaging lessons, involving high-quality work and practical resources to aid understanding of conceptual knowledge. Teachers use precise questioning in class to test conceptual knowledge and skills, and assess children regularly to identify those children with gaps in learning, so that all children keep up. Work is differentiated to meet the needs of all learners and when appropriate children are supported by the class teacher and any supporting adults in school.

As much as possible children are given the opportunity to work independently, in pairs and in mixed ability groupings. Occasionally teachers may carry out a practical experiment for the children to observe.

We build upon the learning and skill development of the previous years if topics are repeated. As the children's knowledge and understanding increases, and they become more proficient in selecting and using scientific equipment, collating and interpreting results. They therefore become increasingly confident in their growing ability to come to conclusions based on real evidence.

Working Scientifically skills are embedded into lessons to ensure these skills are being developed throughout the children's school career and new vocabulary and challenging concepts are introduced through direct teaching. A vocabulary list for each topic has been shared with all staff and staff are aware of age related and topic specific words. Each class has a Science display which has a Working scientifically display - that shows the different elements of the enquiry cycle. Staff use this display as a teaching tool and a reference point throughout a topic as learning progresses.



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 (school garden/ pond) and workshops with experts.

Working scientifically' specifies the understanding of the nature, processes and methods of science for each year group and this is embedded within lessons and focuses on the key features of scientific enquiry, so that pupils learn to use a variety of approaches to answer relevant scientific questions. These types of scientific enquiry include: observing over time; pattern seeking; identifying, classifying and grouping; comparative and fair testing (controlled investigations); and researching using secondary sources. Pupils are given opportunity to seek answers to questions through collecting, analysing and presenting data.

Learning Beyond the Classroom

All our children are offered a wide range of extra-curricular activities, visits, trips and visitors to complement and broaden the curriculum. These are purposeful and links with the knowledge being taught in class. (Animals including humans - PE keeping fit - DT - food technology -Diet- Grub Club, National Space Centre visit , Cardingmill Valley).

Yearly events, such as Science Week allow all pupils to come off-timetable, to provide broader provision and the acquisition and application of knowledge and skills. Children are encouraged to these events often involve families and the wider community. There is often a whole school theme for Science week which staff plan for in year group teams during a planned staff meeting.

The Science lead regularly seeks opportunities to apply for additional Science Funding- British Science Week Grant, Edina Trust Grant. Funding has been used to purchase Science week resources and equipment and University of Wolverhampton workshops.

Science Club - As new pupils to the Junior school setting Year 3 pupils are invited to attend an after school Science club - where they are given the opportunity to develop their Science enquiry skills through practical experiments.

To support learning beyond the classroom a 'knowledge organiser' has been supplied to all parents regarding every science topic. These can be found on our school website in the curriculum section.

Recording and Marking

Within Science children are encouraged to become a 'good scientist' and marking reflects this. Marking in Science comments on the scientific content (see Developmental Marking Policy). Children record in their Science Skills Books but each class also has a 'Science Floor Book' where examples of photographs, post-it notes, notes, newspaper cuttings and observations are glued in.

A progression of Scientific writing is built into the curriculum and link to ARE writing task within each year group.

Children will never be expected to write up a whole investigation at Uplands we rotate the recording of each aspect of an investigation. Following the progression of writing skills children will use writing frames to support their prediction and conclusion recording.

Impact

The successful approach at Uplands results in a fun, engaging, high-quality science education, that provides all our children with the foundations and knowledge for understanding the world around them. Our engagement with the local environment ensures that children learn through varied first hand experiences of the world. When possible learning outside the classroom is embedded throughout the science curriculum utilising our newly refurbished school garden. Through various workshops, trips and interactions with experts and funding bids, children have the understanding that science has changed our lives and that it is vital to the world's future prosperity. Children learn through the curriculum and assemblies about the positive role models within the field of science. Children learn about the life and work of a range of different scientists from various backgrounds. Through our teaching and learning all children feel they are scientists and capable of achieving. Children at Uplands overwhelmingly enjoy science and this results in motivated learners with sound scientific understanding.

Scientific knowledge and conceptual understanding

The programmes of study for each year group describe a sequence of knowledge and concepts around a theme Children's starting points are identified at the beginning of each science topic and the children are able to convey and record what they know already. Teachers use a variety of ways in which to assess children's prior knowledge which include; a powerpoint multiple choice quiz, KWL grid, mini assessment, question/ answer sheet.

At the end of the unit, children's knowledge is checked in line with the key knowledge identified prior to the teaching block. Pupils should be able to describe associated processes and key characteristics in common language, but they should also be familiar with, and use, technical terminology accurately and precisely. They should build up an extended specialist vocabulary and teachers ensure that this is developed within each lesson and throughout each science topic. 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. Through use of the KWL strategy, children are also able to suggest what they would like to learn at the start of each teaching

sequence and this ensures that teachers are able to adapt the programme of study to ensure that this is informed by children's interests and to maximise their engagement with and motivation to study science.

Spoken language

The national curriculum for science reflects the importance of spoken language in pupils' development across the whole curriculum – cognitively, socially and linguistically. At Uplands Junior science lessons provide a quality and variety of subject specific language to enable the development of children's confident and accurate use of scientific vocabulary and their ability to articulate scientific concepts clearly and precisely.

2. Assessment and Monitoring

Children's progress is continually monitored throughout their time at Uplands Junior School and is used to inform future teaching and learning. By the end of key stage 2, our pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study as set out in the National Curriculum 2014. These are set out as statutory requirements. We also draw on the non-statutory requirements to extend our children and provide an appropriate level of interest and challenge.

. Teachers use a variety of methods to inform their end of unit teacher assessments. These include:-

- Observing children at work, individually, in pairs, in a group, and in classes.
- Questioning, talking and listening to children
- Test base assessment Twinkl assessment Grammarsurus end of unit assessment

Children are teacher assessed at the end of every unit according to key learning objectives in both enquiry and subject knowledge. Children will be given a grade of: working towards, met or working above expectations. Assessments are recorded by the class teacher on a grid and monitored by the science co-ordinator.

Data for each year group is collated and will be analysed in Staff or year group meetings. Teachers will discuss:

- Children who are not at expected standard
- Progress / attainment of pupil premium children
- Progress / attainment of SEN

Teams to record ways in which they intend to narrow the gap between these groups and others.

'By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study.' (NC2014)

The science co-ordinator will monitor planning and hold book trawls, giving strengths and areas for development. Observations will also be held where a judgement will be given and learning walks undertaken.

Monitoring of the standards of children's work and of the quality of teaching in science is the responsibility of the science co-ordinator. The work of the science co-ordinator also involves supporting colleagues in the teaching of science, being informed about current developments in the subject, and providing a strategic lead and direction for the subject in the school. An annual summary of science is made, in which strengths and weaknesses in the subject are evaluated using the tracking system on the school server.

3. Planning and Resources

At Uplands planning is a process that all teachers are involved in. Planning should be done with other teachers in the team and uploaded to our school platform for others to access.

The school uses enquiry and subject knowledge objectives from the 2014 national curriculum. Our science planning is in two stages: long term overview and medium term year group plans for each unit on a standardised grid. The long-term plan maps the scientific enquiry skills and topics studied in each term during the key stage.

Our medium term plans are based on the enquiry and subject knowledge objectives. Planning includes: key skill objectives, subject knowledge objectives, assessment focus, activities, resources, key vocabulary and evaluations. The science subject leader keeps and reviews these plans and they can also be found on the learning platform. In this way we ensure complete coverage of the enquiry keys skills required for KS2.

Further evidence of 'good science' taking place in our Upland's classrooms include:

- An active learning environment, showcasing the Uplands Science Enquiry approach, and Relevant Working Scientifically posters for age phase on the working walls during science topic coverage.
- Children being encouraged to ask and answer questions and discuss their work and ideas.
- Children devising and conducting their own investigations within the context of the relevant curriculum content, as well as being given opportunities to develop their working scientifically skills.
- Children recording their findings in a variety of ways.
- Children showing enjoyment in the activities they are undertaking.
- Cross curricular links to science are used when appropriate in other curriculum subjects.

We have sufficient, high-quality science equipment to aid and support the teaching of all units of work taught across Key stage 2. We keep these in a central store, in the resources room both in the trays and in the metal cabinet. All resources are labelled and easily accessible to all staff. We are continuously developing / purchasing our resources for all science teaching units in the school. The library contains a good supply of science topic books and teachers have access to an online resource.

Staff CPD

The Science co-ordinators keep staff updated with good practice and new initiatives within staff meetings and base meetings. Through monitoring and learning walks the Science co-ordinators offer support to staff where required.

All new staff are given a 'Science Handbook' to support their teaching and learning, this includes the following:

- What does Science look like at Uplands
- Enquiry Cycle
- Teaching/Planning format - with examples
- Non-negotiables
- Recording in Science
- Progression in Writing and Maths skills
- How will I record my data today?
- Progressive marking prompts
- Floor Book Guidance

4. Organisation

Science is taught weekly and work is recorded in an orange Science book.

| | Year 3 | Year 4 | Year 5 | Year 6 |
|----------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| Autumn 1 | Forces and magnets | Living Things & Their Habitats | Earth & Space | Electricity |
| Autumn 2 | Animals Including Humans | Electricity | Properties and changes | Animals Including Humans |
| Spring 1 | Working Scientifically Science Week |
| Spring 2 | Rocks | Sound | Living Things and their Habitats | Light |
| Summer 1 | Light | Animals Including Humans | Animals Including Humans | Living things and Their Habitats |
| Summer 2 | Plants | States of Matter | Forces | Evolution and inheritance |

5. Healthy and Safety

The school's Health & Safety Policy outlines the safe codes of practice for our school and provides the necessary guidance on the response and the reporting of all incidents.

Children are encouraged to assess hazards and discuss the appropriate precautions. Children are taught the appropriate safe practice when using equipment. This will include:

- how to use equipment correctly and in accordance with health and safety guidelines
- to behave in a considerate and responsible manner, showing respect for other people and the environment whilst on trips outside the classroom.

All staff should follow the health and safety guidelines set out in the 'Be Safe' publication held by the science co-ordinator.

All staff should follow the most up to date risk assessment for COVID-19 or any other pandemic.

6. Equal opportunities

At Uplands Junior School we are committed to providing all of our children with an equal entitlement to scientific activities and opportunities regardless of race, gender, culture or class.

7. Inclusion

At Uplands we aim to meet the needs of all our children by differentiation in our science resources and in providing a variety of approaches and tasks appropriate to ability levels. This involves providing opportunities for SEND children to work in small guided groups with support from a Teaching assistant / teacher when possible. This will enable children with learning and/or physical difficulties to take an active part in scientific learning and practical activities and investigations. Some children will require closer supervision and more adult support to allow them to progress whilst more able children will be

extended through differentiated activities and questioning. By being given enhancing and enriching activities, more able children will be able to progress to a higher level of knowledge and understanding appropriate to their abilities. Teachers will use a range of teaching and learning strategies that will include and motivate all learners, ensuring that optimum progress is made throughout the lesson.

Review

To be reviewed July 2023