



Science

Intent

At Uplands Manor Primary School we believe that Science is part of a well sequenced set of skills which are able to provide our children with powerful knowledge to lead purposeful, successful lives and make a positive contribution to society. Science at our school will provide our children with the foundations to aid them to discover and understand the world around them. We encourage children to develop natural curiosity, giving all children a strong knowledge and appreciation of the world. Working Scientifically, skills are built-on and developed each academic year so that the children can apply their knowledge of science when using equipment, conducting experiments, constructing arguments and explaining concepts confidently, as well as continuing to ask questions and becoming more inquisitive about their surroundings.

The 2014 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 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

Implementation

Teachers create a fun, engaging and positive atmosphere in science through our four curriculum drivers which give our school the 'Ex Factor' and bring about the aims and values of our school and respond to the particular needs of our multicultural and diverse community.

- **Excite** –Children are inspired to learn through an engaging sequence of lessons, each of which builds on prior knowledge. Science lessons at Uplands are planned so that the children have a hands on experience through fun experiments and conducting investigations in groups or as individuals.
- **Experience** – Our science curriculum includes experiential opportunities, such as visits from animal specialists, exciting interactive science show at school, thematic days and visits to our local parks and forest school area. This develops pupils' cultural capital and vocabulary which allows the children to become independent thinkers and learners.
- **Extend** - We ensure each lesson is started with a 'Knowledge Retrieval' where the children complete a quick task which revisits and consolidates prior learning. As well as working collaboratively, children are encouraged to work well independently, to make good progress and give greater depth to their scientific understanding.

Impact

Our successful approach at Uplands Manor results in an engaging and high-quality science education, which provides children with the fundamental knowledge for understanding the world. Our connections with the local community ensure that children learn through varied and first hand experiences of the world around them. Children develop a better understanding about how science has changed our lives through various trips and interactions with experts within our local area. We ensure all children have access to role models within the field of science who are from a diverse range of backgrounds, making all children feel like they are scientists and capable of achieving.

Teaching and learning

- Teacher to follow the medium term and short term plan from the scheme **Switched Science** available on Rising Stars.
- Science planning should involve real life contexts, where children are investigating scientific questions with a real purpose in mind, appropriately linked to their topic.
- Teachers should regularly plan for opportunities for children to apply their scientific skills to different areas within science lessons and across the curriculum. This will cover the breadth, allowing children to revisit, practice and consolidate different areas of science and apply them within different contexts.
- Pupils are encouraged to build their curiosity by asking their own questions and having the opportunity to use their scientific skills to research and discover their answers. Teachers should further stimulate and challenge pupil's questioning to test their conceptual knowledge and skills.
- Pupils are exposed to new vocabulary and challenging concepts through direct teaching.
- Working scientifically skills are rooted into lessons to ensure these skills are developed throughout the children's school journey.
- Teachers find opportunities to develop children's understanding by accessing outdoor learning where appropriate.

Organisation

Foundation stage

Science is taught as an essential part of the topic work in Reception and nursery classes. Reception class follow the Foundation Stage of the National Curriculum that is set out in the Early Learning Goals (ELGs). Science plays a significant contribution to the objectives in the ELGs of developing children's knowledge and understanding of the world

Key Stage One

In Key Stage One, pupils should be taught the following skills through the teaching of the programme of study content:

- Ask simple questions and recognise that they can be answered in various ways
- Make close observations by using simple equipment
- Perform simple tests
- Identify and classify
- Use their observations and ideas to suggest answers to questions
- Gather and record data to support and assist them in answering questions

Key Stage Two

In Key Stage Two, pupils should be taught the following experimental skills and investigations through the teaching of the programme of study content:

LKS2 Years 3 and 4

- Ask relevant questions and use different types of scientific enquiries to answer them
- Set up simple practical enquiries, comparative and fair tests
- Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, use a range of equipment, including thermometers and data loggers
- Gather, record, classify and present data in a variety of ways to help in answering questions
- Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables
- Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
- Identifying differences, similarities or changes related to simple scientific ideas and processes

- Using scientific evidence to answer questions or to support their findings.

UKS2 Years 5 and 6

- Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
- Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
- Use test results to make predictions and set up further comparative and fair tests
- Report and present findings from enquiries.

Overview of units

Science will be taught in planned topic blocks which have a project-based approach.

All topics are taken from **Switched Science** and coincide with the National Curriculum objectives.

	Autumn		Spring		Summer	
Year 1	Sound	Everyday Materials	Seasonal Changes		Plants	Animals Including Humans
Year 2	Everyday Materials	Living Things and their Habitats	Animals Including Humans		Plants	
Year 3	Rocks		Animals Including Humans	Plants	Light	Forces and Magnets
Year 4	Electricity		Sound	Living Things and their Habitats	Changing States	Animals Including Humans
Year 5	Evolution and inheritance	Forces	Living Things and their Habitats	Animals Including Humans	Materials	Earth and Space
Year 6	Light	Electricity	Living Things and their Habitats		Animals Including Humans	

Assessment

HANDS ON SCIENCE

- Assessment for learning should take place throughout the entire science lesson, facilitating teachers to adapt their teaching/input to meet the children's needs. Feedback should be incisive and regular.
- Pupils should have the opportunity to self and peer-assess against the learning objective and success criteria, giving them a sense of success.
- Pupil's work should be marked in line with the School Marking Policy. Marking should address misconceptions, allowing children the chance to correct any mistakes.
- At the beginning of each lesson, time should be given for pupils to complete a quick knowledge retrieval.
- Assessment of pupil work and progress should be on-going by the class teacher and informs future planning.
- Teachers to use formative and summative assessment against the KS1, LKS2 or UKS2 descriptors which allows teachers to assess children's progress in science, gathering evidence over the course of the year.
- Assessment will take place at the end of each topic using 'Hands on Science' providing a standardised score for each pupil.
- Teachers to update DCPRO on a termly basis to assess all pupils against the National Curriculum descriptors and where children are in relation to their age expected standards.

Recording work and class organisation

Depending on the nature of the lesson, pupil's work will be presented in various forms:

- Photographic
- Pictorial / diagrammatic / graphical / symbolic
- Verbal
- Written especially in Key Stage 2
- Through the use of technology / computing

Science involves hands on experience and enquiry based learning. Children will be grouped appropriate to the tasks in order to stimulate flexibility:

- Mixed ability groups/partners
- Whole class groups

Health and safety

- When planning, teachers are expected to assess the risks and adjust their lessons accordingly to ensure the safety of all pupils and appropriate level of supervision is in place.
- All children will be informed of any risks or hazards but will also be encouraged to assess and identify risks for themselves.
- Children will be shown how to use scientific equipment safely.
- Safety glasses / gloves will be used where appropriate.