

# Curriculum Policy-

# Science



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**Belong. Believe. Become.**

## **Mandale Mill Primary School**

### **Curriculum Policy- Science**

#### ***Intent-***

At Mandale Mill Primary School, our vision is to provide a Science curriculum which enables pupils to explore and discover the world around them, so that they have a deeper understanding of the world we live in. Our science curriculum offers the foundations for understanding the world through the specific disciplines of biology, chemistry and physics, with our curriculum design for Science promoting specific competences including knowledge, enquiry and working scientifically based skills. We provide a stimulating curriculum to further develop our children's enquiring minds, so they eventually become strong independent learners. The Science curriculum at Mandale Mill Primary School allows our children to make links to prior learning and develop key skills that are rich and challenging with the aim of providing our children with opportunities and experiences that will remain with them for the rest of their lives. By providing these opportunities to our children and giving them a positive experience of Science throughout their school journey, we can ensure that our children are motivated, confident, life-long learners who will continue to explore the world around them, way beyond their time in education.

#### ***Aims:-***

The 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 knowledge required to understand the uses and implications of science, today and for the future

#### ***Implementation-***

##### ***How we teach science at Mandale Mill Primary School-***

#### **Long term plan**

The Science curriculum at Mandale Mill Primary School is a rich, broad and wondrous curriculum that allows of our children to connect and build on previous scientific knowledge so that they can progress and develop to become knowledgeable scientists. The long term plan helps to promote a high level of enjoyment and engagement for our children whilst making them curious about the world around them.

## **Road Map**

## Termly Topics

The Science curriculum at Mandale Mill Primary School is created and designed based on the thoughts, opinions and voice of all pupils and staff. For Science, children participate in six half termly topics across the academic year. This is done, so that all children can have access to the different specific scientific disciplines, biology, physics and chemistry. This allows the children to develop and grow their subject knowledge in these disciplines and develop an understanding of what each discipline entails. Every year group has one half term that is dedicated to scientific investigations on top of five other topics that have the element embedded in the science knowledge being taught.

## Early Years

In foundation stage pupils will work from the Knowledge and Understanding of the world planning from the Early Years scheme of work. This planning aims to develop in pupils the crucial knowledge, skills and understanding that help them make sense of the world. It provides opportunities for pupils to carry out activities based on first hand experiences that encourage exploration, observation, problem solving, prediction, critical thinking, decision making and discussion. It provides the foundations for the Science curriculum in Key Stage One and for Key Stage Two

## Knowledge Organisers

All pupils at Mandale Mill Primary School in Key Stage One and Key Stage Two have a Science exercise book where their learning is evidenced through a variety of activities. At the beginning of every half termly topic, a knowledge organiser is presented to the children and is placed inside their exercise book which enables pupils to access essential knowledge, vocabulary, clear diagrams, explanations, skills and key terms.

### Plants

**Key vocabulary to describe different parts of plants**

leaf	trunk
flower	branch
petal	stem
fruit	twig
seed	shoot
root	bud

**Deciduous trees lose their leaves in the autumn every year**

**Evergreen trees have green leaves all year round**

**Significant scientist**

**Richard Spruce (1817-1893)** was an English botanist and explorer who carried out detailed studies of the plants in the Amazon Rainforest.

← Previous learning links

Early Years  
Woodlands

Future learning links →

Plants learning  
Rainforests

Year One

### Earth and Space

**Key vocabulary**

Earth	Moon	Sun
lightbulb	star system	orbit
star	planet	planet

It takes 365.25 days for the earth to orbit the sun. It takes 28 days for the moon to orbit the earth.

The amount of Moon we see changes over the month - lunar phases

**Significant scientist**

**Margie Adams-Powell (born 1962)** is a British space scientist and science educator. She is working on the observation instruments for the Aegis satellite, which will measure wind speeds help the investigation of climate change.

← Previous learning links

Water exploration  
(History)

Future learning links →

Maths (History)

Year Four

### Light

**Key vocabulary**

light	light source	dark
absence of light	translucent	transparent
opaque	shiny	rough
shadow	reflect	mirror
sunlight	straight lines	light rays

Shadows are evidence of light travelling in straight lines. An object blocks light so that it can't reach the surface where we see the shadow. The shadow is the same shape as the object blocking the light.

Light travels in straight lines. Once light has been produced, it will keep travelling in a straight line until it hits something else.

**Significant scientist**

**Abu Ali al-Hasan (Alhazen) (965-1039)** was an Arabic mathematician, astronomer and physicist. He was the pioneer of modern optics. He carried out experiments with pinhole cameras and cameras and explained how the image is formed by rays of light travelling in straight lines.

← Previous learning links

Light  
Earth and space

Future learning links →

IT ready

Year Six

## Weekly lessons

Every child at Mandale Mill Primary School accesses the Science curriculum once a week. The aim of the Science lessons is to deliver high quality lessons that help build on pupils existing ideas. In all of the lessons taught, there should be opportunities for children to have their ideas analysed, a chance to investigate, test and research ideas and develop processing skills. Lessons should challenge the children not only to work independently but to work with their peers to learn and investigate through open ended questions and investigations. All of the Science lessons that are delivered are cross-curricular as they provide children with the opportunity to develop their mathematical,

reading, writing and computing skills. Where possible they also link with the over arching topic theme for the half term.

### ***Cross-Curricular learning***

#### ***Writing***

Science contributes significantly to the teaching of English in Mandale Mill Primary school by actively promoting the skills of reading, writing, speaking and listening. The children develop oral skills in science lessons through discussions and through recounting their observations of scientific experiments. They develop their writing skills through writing up their findings and recording information.

#### ***Maths***

The Science curriculum also contributes to the teaching of Mathematics in several ways. The children use weights and measures and learn to use and apply number. Through working on investigation, the children learn to estimate and predict. Science also allows the children to use numbers in many of their answers and conclusions to investigations carried out. The science curriculum has been aligned with our maths curriculum so the expectation is clear.

#### ***Computing***

Computing can be used to make science lessons more accessible for all pupils. It allows children to capture images and videos to collate as evidence and look back on. Computing also allows work to be presented at in a variety of formats, e.g. filming on iPad/text to speak/photograph.

### ***SEND***

At Mandale Mill Primary School we teach Science to all of our children, whatever their ability. Science is a key foundation of the school curriculum and it provides a broad and balanced education to all children. Children whose needs are greater than their peers, will be able to access the Science curriculum through amended and differentiated tasks that will extend and challenge their knowledge and understanding , enabling them to progress at the appropriate level for their ability. The teacher's understanding of the curriculum and their children allows staff to respond to each individual child's need, resulting in learning and lessons being adapted to ensure Science is accessible to all learners.

### **Health and Safety**

All staff must check that the scientific resources that they are using for their lessons are thoroughly checked and safe to use . At the start of the lesson, all staff should make children aware of any potential hazards that could occur with the use of materials and equipment and help educate children of how materials and equipment should be handled so that no harm is caused to themselves or their peers. It is the responsibility of all staff to report recurrent hazards to the Science Leader who will address this accordingly. For some investigations staff will be required to complete a risk assessment.

### ***Resources***

All staff and children have access to modern and updated scientific resources, so that all Science lessons can be of consistent high quality. The Science resources are stored in the Science and Maths cupboard, upstairs in the KS2

corridor. The Science leader is responsible for managing these resources and making sure they are regularly checked to ensure quality provision and to make sure that damaged equipment is replaced and updated when necessary. Regular equipment audits take place, so that staff have all the equipment they need ready to teach their half termly topic. Furthermore, books within the reading canon across school have been carefully selected to support learning in reading and make cross curricular links with Science.

**Wider opportunities**

**After School Clubs**

As part of the extra-curricular offer at Mandale Mill Primary School, a Science club has been run by the Science Leader for children in both Key Stage One and Key Stage Two. The club incorporates the specialist areas of physics, chemistry and biology and involves all children participating in engaging investigations and projects that helps consolidate learning and understanding.


**How we assess Science at Mandale Mill Primary School-**

**Half-termly assessments**


At the end of each half termly topic in Science, pupils complete a ‘topic quiz’ which entails all the key elements of learning and skills the children will have obtained throughout that half term. Teachers will then use the quiz alongside their own teacher judgement to assess whether the children in their class are Working Towards (WT), Expected (EXS) or Greater Depth (GDS) at the end of each unit. Following this, the data will then be inputted onto Insight to enable the Assessment lead, Curriculum Lead and Science leader to track and monitor progress over time.

**Plants**


1. Match the names with the correct image:  
Silver Birch    Rose plant    Daffodil plant    Daisy plant



2. Tick to show whether the tree is deciduous or evergreen:

	Deciduous	Evergreen
		
		
		
		

3. Name the parts of the plant-

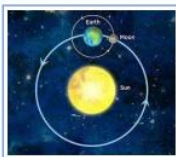


4. Fill in the missing name:  
R \_\_\_\_\_ S \_\_\_\_\_  
was a botanist and explorer who carried out studies of the plants in the Amazon Rainforest.

Teacher comments:

Year One

**Earth and Space**




1a. Explain how the earth moves on its axis-  
1b. Explain how the earth moves around the sun-  
1c. Explain how the moon moves around the earth-

2. Explain why earth experiences night and day

3. Why does the sun appear to move across the sky during the day?

4. Who is Maggie Adair Poulack?



5. List the planets in our solar system in the correct order:  
The Sun

Teacher comments:

Year Four

**Light**

1. Explain how we see things. Use the image below to support your answer:



2. Use your knowledge of how light travels to explain why shadows cast the shapes they do.



3. Why is light needed for us to see objects?

4a. How does light travel?  
4b. How could you use the equipment below to prove this?



5. Abu Ali al-Hasan was the pioneer of modern optics. What did his experiments prove?

6. Name three light sources:  
1. \_\_\_\_\_  
2. \_\_\_\_\_  
3. \_\_\_\_\_

Teacher comments:

Year Six

### ***Assessment for learning***

Assessment for learning should be used to support the progress of children in all aspects of the curriculum. At Mandale Mill Primary School believe in using and implement different specific strategies to help identify the learning of our children. The following strategies should be used in Science lessons:-

- Questioning
- Teacher feedback
- Peer assessment
- Self-assessment
- Outcome led

All Science lessons should involve principles and skills that the children are expected to develop and use. For questioning, all staff should use questioning throughout their Science lessons that are thought provoking for all children. Children should be encouraged by all staff to reflect on their work or investigations identifying what has worked well, what hasn't and what they would have done differently.

Monitoring of pupil knowledge in Science also takes place through learning walks, book looks, pupil voice and staff voice.

### ***Expectations of children***

The impact of the Science curriculum that is planned and the lessons that are delivered by staff will enable all of the children at Mandale Mill Primary School to :-

- Become curious and creative
- Build critical and iterative thinking skills
- Develop their analytic thinking and logical reasoning skills
- Develop their problem-solving skills and vocabulary
- Work effectively as part of a team.

### ***Responsibility of the Science Leader:***

- Formulating, reviewing and updating policy document guidelines.
- Ensuring the Long-term plan of work is implemented.
- Ensuring that the curriculum is relevant to the ability and needs of all pupils and reflects cross curricular opportunities, special educational needs and equal opportunities.
- Producing an action plan.
- Monitoring standards of teaching and learning in accordance with the monitoring schedule.
- Informing the Head teacher and curriculum lead of standards and developments within the subject.
- Keeping up to date with the latest developments and inform staff.
- Acting as a consultant to other members of staff.
- Liaising with outside agencies.
- Organising and maintaining resources.
- Monitoring progress and checking pupil understanding of key skills and knowledge
- Tracking assessment within the subject area

- Liaising with Governors and other stakeholders.
- Provide CPD to staff where necessary
- Work alongside curriculum leader

**This policy will be monitored by the Science Leader. They will also ensure that the policy is working in practice and review it every two years.**

**This policy should be read in conjunction with the Teaching and Learning policy.**



**Article 3:** All adults should do what is best for you. When adults make decisions, they should think about how their decisions will affect children.

**Article 28:** Every child has the right to a good education.

**Article 29:** Your education should help you use and develop your talents and abilities.

It should also help you learn to live peacefully, protect the environment and respect other people.