



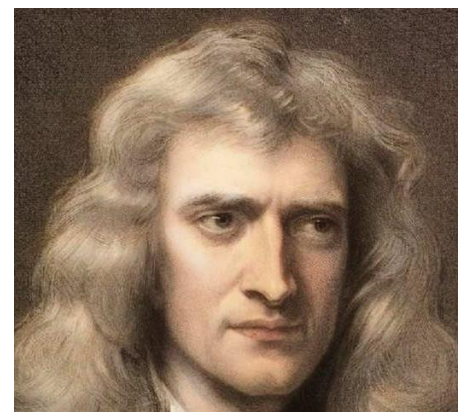
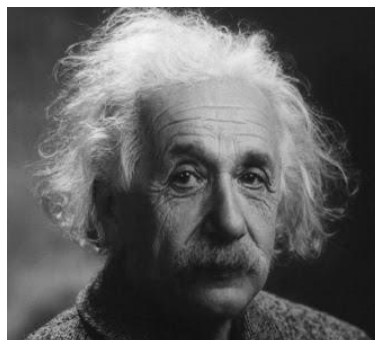
***Our Mission: To improve the communities we serve for the better***

***Vision:***

*Challenging educational orthodoxies so that every child makes good progress in core subjects;  
all teachers are committed to personal improvement and fulfil their responsibilities;  
all children receive a broad and balanced curriculum;  
all academies strive to be outstanding.*

# Science Policy

September 2021





## **National Curriculum Purpose of Study**

A high-quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Science has changed our lives and is vital to the world's future prosperity, and all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational knowledge and concepts, pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes.

## **Aims of The National Curriculum**

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 scientific enquiry 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.

## **Approach to Teaching and Learning**

In Forge schools we recognise that science teaching includes two parts: the knowledge and content of each topic, and the scientific enquiry (investigative) skills that children need to develop. Long-term planning builds in time for scientific enquiry at the end of each topic (cross-curricular contexts), and children plan investigations.

## **Resources**

Science resources are stored in a specific location within each school and are clearly labelled. There is a full inventory of resources in each school.



## **ICT and Science**

We encourage the use of ICT in Science where it adds value to learning. Data logging technology is used in certain topics, and digital cameras are used to capture information where information has been recorded on whiteboards.

## **The Contribution of Science to Other Subjects**

Science naturally has cross-curricular links with other subjects such as maths. For example, data obtained in science lessons can be used in maths lessons. There are also various writing opportunities that can be capitalised upon, such as writing up experiments or investigations, or writing instructions and explanation texts linked to learning in lessons.

## **EYFS**

We teach science in the Foundation stage as an integral part of the topic work covered during the year. It comes within Understanding the World in the EYFS. Children must be supported in developing the knowledge, skills and understanding that help them to make sense of the world. Their learning must be supported through offering opportunities for them to use a range of tools safely; encounter creatures, people, plants and objects in their natural environments and in real-life situations; undertake practical 'experiments'; and work with a range of materials.

## **Assessment**

We assess children's work in science by measuring their understanding of a topic: we pre and end-test concept pyramids that contain all key concepts and vocabulary related to a specific topic. On completion of a piece of work the teacher marks the work and comments as necessary. Children also have the opportunity to reflect about their learning at the end of a topic, and fill in a 'reflection box' that states what they have learnt and what they would still like to know more about.

Reports to parents are completed at the end of the academic year where reference is made to the individual's progress in this area of the curriculum, linked to National Curriculum age related standards.

## **Equal Opportunities**

Equal Opportunities. It is the responsibility of all teachers at The Forge Trust to ensure that children irrespective of ability, race, gender, age, faith, sexual orientation, and disability are given full access to the science curriculum and make the greatest possible progress in accordance with recent legislation. Please refer to the schools Equal Opportunities Policy.

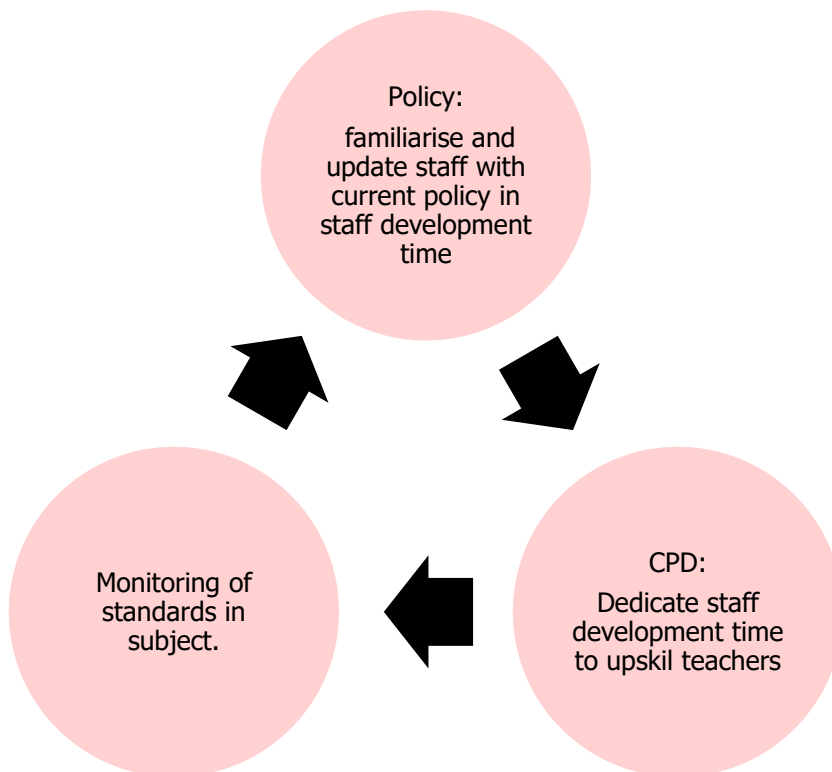
## National Curriculum Objectives

Key Stage	Subject Content
Key Stage 1	<p>The principal focus of science teaching in key stage 1 is to enable pupils to experience and observe phenomena, looking more closely at the natural and humanly-constructed world around them. They should be encouraged to be curious and ask questions about what they notice. They should be helped 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. They should 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, but there should also be some use of appropriate secondary sources, such as books, photographs and videos.</p> <p>'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. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content.</p> <p>Pupils should read and spell scientific vocabulary at a level consistent with their increasing word reading and spelling knowledge at key stage 1.</p>
Key Stage 2	<p>The principal focus of science teaching in lower key stage 2 (Y3/4) is to enable pupils to broaden their scientific view of the world around them. They should do this through exploring, talking about, testing and developing 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. They should 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. They should draw simple conclusions and use some scientific language, first, to talk about and, later, to write about what they have found out.</p> <p>'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 programme of study. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content.</p> <p>Pupils should read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge.</p> <p>The principal focus of science teaching in upper key stage 2 (Y5/6) is to enable pupils to develop a deeper understanding of a wide range of scientific ideas. They should do this through exploring and talking about their ideas; asking their own questions about scientific phenomena; and analysing functions, relationships and interactions more systematically. At upper key stage 2, they should encounter more abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. They should 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.</p> <p>'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. Throughout the notes and guidance, examples show how scientific methods and skills might be linked to specific elements of the content.</p> <p>Pupils should read, spell and pronounce scientific vocabulary correctly.</p>

## Monitoring

It is the responsibility of the Science co-ordinator to ensure the implementation of this policy, monitor standards, offer advice and support to staff, provide a model and promote excellence in children's achievements.

This will involve the following cycle:



The co-ordinator will ensure that development priorities are reflected in the Subject Action Plan. They will attend termly network meetings for Science and work collaboratively with other leaders in The Forge Trust to improve the curriculum. CPD, standards and provision in the subject.

**Appendix 1: Example Learning Journey and Concept Wall**

**Animals including Humans Y1: Key Concepts and Vocabulary**

			<b>omnivore</b>			
		<b>carnivores</b>	<b>herbivore</b>	<b>human</b>		
	animal	reptiles	amphibians	mammals	hearing	
pets	birds	fish	smell	touch	taste	sight

<b>Learning Journey</b>			
<b>In this unit of work, we cover these learning objectives:</b>	<b>WTS (Supported)</b>	<b>EXS (Independent)</b>	<b>A (Greater Understanding)</b>
To identify and name a variety of common animals including, fish, amphibians, reptiles, birds and mammals			
To identify and name a variety of common animals that are carnivores, herbivores and omnivores			
To describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets)			
To identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.			



**Appendix 2: Example Pre/ Post Test**

**Evolution and Inheritance:** Please write your definition in the table below or if you are not sure what the word means, write T for target.

**Date of pre-test (to be completed half a term before unit so planning can build on prior learning):**

**Date of end-test (to be completed end of the unit of work):**

Fossils	Pre-test	Evidence	Pre-test
	Post-test		Post-test
Offspring	Pre-test	Selective breeding	Pre-test
	Post-test		Post-test



Adaptation	Pre-test	Cross breeding	Pre-test
	Post-test		Post-test
Evolution	Pre-test	Natural selection	Pre-test
	Post-test		Post-test
Environment	Pre-test	Genes	Pre-test
	Post-test		Post-test



Variation	Pre-test	Intervention	Pre-test
	Post-test		Post-test
Theory	Pre-test	Ethical	Pre-test
	Post-test		Post-test
Separation	Pre-test	DNA	Pre-test
	Post-test		Post-test



Learning Journey: Self-assessment to be completed after the scheme of work.

**\*This will be completed at the same time as the pre and end tests\***

(please write 1,2 or 3 in the space provided). 1. means that you are confident and could explain the objective to a friend; 2. means you could partly explain the objective, but have some questions; 3. means that you would like more help.

Learning Journey	Pre-test	Post-test

Level	Range	Quantity of marks pre-test	Quantity of marks post-test
B	0-3		
W1	4-5		
W2	6-8		
N	9-12		
A	13-15		



**Appendix 3: Example Teacher Assessment Grid**  
**Working Scientifically Assessment**

<b><u>Year 6 Assessment</u></b>			
<b>Working Scientifically</b>	<b>Autumn</b>	<b>Spring</b>	<b>Summer</b>
Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.			
Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.			
Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.			
Using test results to make predictions to set up further comparative and fair tests.			
Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations.			
Identifying scientific evidence that has been used to support or refute ideas or arguments.			

Teachers to assess one topic per term through observation (Supported= W, Independent = N, Greater Understanding= A)