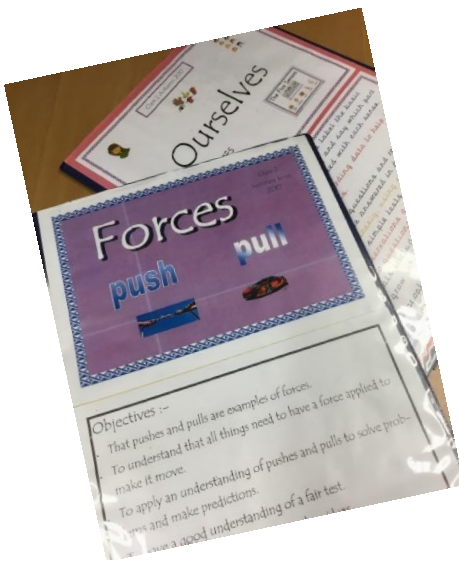


# Clee Hill Community Academy Science Policy

Written by:	Julia Hilton
Approved:	January 2020
To be reviewed by	January 2023

At Clee Hill Academy we aim to encourage our children to develop their curiosity of the world around them, providing first hand experiences to help develop enquiring minds through questioning, discussion and collaboration. We aim to provide access for all children in science through practical, meaningful and challenging activities that stimulate young minds, creating independent inquisitive learners who enjoy science.



## **Principal Focus**

### **KS1 (Year 1/2) :-**

- To enable children to experience and observe phenomena in the world around them.
- To be curious and ask questions about what they see.
- Learn about science through first hand practical experiences.
- To develop an understanding of scientific ideas.
- Use different types of enquiry to answer questions.
- Use simple scientific language to communicate ideas.
- Learn information through secondary sources – books, photographs, vidoes.

### **Lower KS2 (Year 3/4) :-**

- To broaden their scientific view of the world around them.
- Explore, discuss, test and develop ideas about different phenomena.
- Understand relationships between living things and familiar environments.
- Develop ideas about functions, relationships and interactions.
- Ask their own questions about what they see.
- Decide which type of scientific enquiry to use.
- Find things out using secondary sources and information.
- Draw simple conclusions using some scientific language.

### **Upper KS2 (Year 5/6) :-**

- To develop a deeper understanding of a wide range of scientific ideas.
- Talk about and explore their ideas.
- Ask questions about scientific phenomena, analyse functions, relationships and interactions more systematically.
- Start to recognise that scientific ideas change and develop over time.
- Choose appropriate scientific enquiries to answer questions.
- Use a wide range of secondary sources to find things out.
- Draw conclusions based on data and observations.
- Use evidence to justify ideas.
- Use scientific knowledge to explain findings.

## Scientific enquiry

We aim to teach our children science through a range of scientific enquiry as well as knowledge and understanding. There are five different types of enquiry that will be used:-

Identifying and classifying

Pattern seeking

Observing

Comparative and fair testing

Research using secondary resources

### Identifying and classifying

Which types of animal have scales?  
Which material is the best for mopping up water?  
Do all flower seeds look the same?

### Pattern Seeking

Do children with longer legs jump the furthest?  
Do taller plants grow from bigger seed?

### Observing

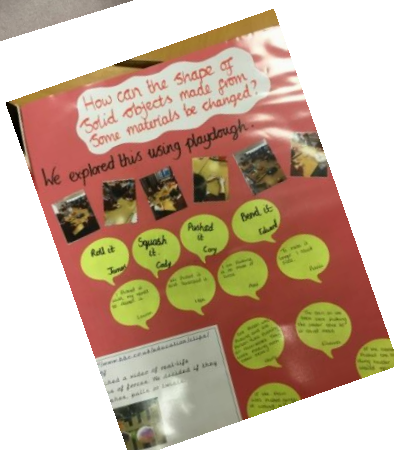
What happens to different materials if they are buried for a long time?  
Where is the best place to keep chocolate?

### Comparative and fair testing

What conditions do plants need to grow?  
Which material will make the best parachute?  
Which habitat contains the most variety of plants?

### Research using secondary resources

Famous people/scientists e.g  
Marie Curie/Charles Darwin/Thomas Edison  
Why don't we grow bananas in this country?



## Working Scientifically

### KS1

During years 1 and 2, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- asking simple questions and recognising that they can be answered in different ways
- observing closely, using simple equipment
- performing simple tests
- identifying and classifying
- using their observations and ideas to suggest answers to questions
- gathering and recording data to help in answering questions.

### Lower KS2

During years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- asking relevant questions and using different types of scientific enquiries to answer them
- setting up simple practical enquiries, comparative and fair tests
- making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers
- gathering, recording, classifying and presenting data in a variety of ways to help in answering questions
- recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables
- reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
- 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 straightforward scientific evidence to answer questions or to support their findings.

### Upper KS2

During years 5 and 6, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- 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 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.

A breakdown of the programs of study for each year group can be found at :-

[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/425618/PRIMARY\\_national\\_curriculum\\_-\\_Science.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/425618/PRIMARY_national_curriculum_-_Science.pdf)

## Long Term Plan

Class 1 Year R/1	Class 2 Cycle A Year 1/2	Class 2 Cycle B Year 1/2	Class 3 Cycle A Year 2/3	Class 3 Cycle B Year 2/3
<b>Working scientifically</b>	<b>Working scientifically</b>		<b>Working scientifically</b>	<b>Working scientifically</b>
<b>Animals, including humans</b> (naming animal and body parts) Y1	<b>Animals, including humans</b> (naming animal and body parts) Y1	<b>Animals, including humans</b> (Health and growth) Y2	<b>Animals, including humans</b> (skeletons) Y3	<b>Animals, including humans</b> (Health and growth) Y2
<b>Plants</b> (names and structure) Y1	<b>Plants</b> (names and structure) Y1	<b>Living things and their habitats</b> (suitable habitats/simple food chains) Y2	<b>Plants</b> (functions of parts and life cycles) Y3	<b>Living things and their habitats</b> (suitable habitats/simple food chains) Y2
		<b>Plants</b> (growing conditions for seeds and bulbs) Y2		<b>Plants</b> (growing conditions for seeds and bulbs) Y2
<b>Everyday materials</b> (names and properties of simple materials) Y1	<b>Everyday materials</b> (names and properties of simple materials) Y1	<b>Uses of every day materials</b> (suitability and changing shapes of materials) Y2	<b>Rocks</b> (Simple properties, fossils, soils) Y3	<b>Uses of every day materials</b> (suitability and changing shapes of materials) Y2
	<b>Electricity</b>			<b>Light</b> (dark is the absence of light, size of shadows) Y3
	<b>Light</b>	<b>Sound</b>		
	<b>Forces</b>		<b>Forces and magnets</b> (friction-how things move on different surfaces/magnets) Y3	
<b>Seasonal Changes</b> (changes and weather)	<b>Seasonal Changes</b> (changes and weather)	<b>Seasonal Changes</b> (changes and weather)		

Class 4 Cycle A Year 4/5	Class 4 Cycle B Year 4/5	Class 4 Cycle C Year 4/5	Class 5 Cycle A Year 5/6	Class 5 Cycle B Year 5/6	Class 5 Cycle C Year 5/6
<b>Working scientifically</b>	<b>Working scientifically</b>	<b>Working scientifically</b>	<b>Working scientifically</b>	<b>Working scientifically</b>	<b>Working scientifically</b>
<b>Animals, including humans</b> (changes in humans as they grow) Y5	<b>Animals, including humans</b> (changes in humans as they grow) Y5	<b>Animals, including humans</b> (teeth, eating and digestion) Y4	<b>Animals, including humans Y6</b> (circulatory system, functions of heart, blood vessels and blood, health, water transport in animals)	<b>Animals, including humans Y6</b> (circulatory system, functions of heart, blood vessels and blood, health, water transport in animals)	<b>Animals, including humans</b> (teeth, eating and digestion) Y4
<b>Living things and their habitats</b> (life cycles, reproduction) Y5	<b>Living things and their habitats</b> (life cycles, reproduction) Y5	<b>Living things and their habitats</b> (grouping and simple classifying/changes to habitats can pose dangers) Y4	<b>Living things and their habitats</b> (classifying including micro-organisms) Y6	<b>Living things and their habitats</b> (classifying including micro-organisms) Y6	<b>Living things and their habitats</b> (classifying including micro-organisms) Y6
<b>Properties and changes Y4</b> (more properties including thermal and electrical conductivity, mixing and separating reversible and irreversible)	<b>Properties and changes Y4</b> (more properties including thermal and electrical conductivity, mixing and separating reversible and irreversible)	<b>States of matter</b> (solids, liquids, gases, heating and cooling, water cycle) Y4		<b>Properties and changes Y4</b> (more properties including thermal and electrical conductivity, mixing and separating reversible and irreversible)	<b>States of matter</b> (solids, liquids, gases, heating and cooling, water cycle) Y4
	<b>Light</b> (Travels in straight lines, how we see things) Y6	<b>Electricity</b> (simple circuit, switches, conductors and insulators) Y4	<b>Electricity</b> (what affects bulb brightness, buzzer volume, voltage, symbols) Y6	<b>Light</b> (Travels in straight lines, how we see things) Y6	<b>Electricity</b> (what affects bulb brightness, buzzer volume, voltage, symbols) Y6
		<b>Sound</b> (fainter sounds further away, vibrations)			<b>Sound</b> (fainter sounds further away, vibrations) Y4
<b>Forces</b> (gravity, friction, air-resistance, levers, pulleys and gears) Y5	<b>Earth and Space</b> (other planets) Y5		<b>Forces Y5</b> (gravity, friction, air-resistance, <u>levers, pulleys and gears</u> )	<b>Earth and Space</b> (other planets) Y5	
<b>Evolution and inheritance</b> (more about fossils, adaptation) Y6			<b>Evolution and inheritance</b> (more about fossils, adaptation) Y6		



## Medium Term Plan example



### Clee Hill Community Academy Medium Term Science Planning

**Class 2 Year 1 and 2 Term Autumn 2017**

**Cross-curricular Links:**

History English  
D and T Maths  
PHSE Geography

**Science Topic**

**Ourselves**

Animals including humans/Electricity

See science planning booklet for each year group for more detail. All work recorded in Big Books.

**Resources including scientists and engineers**

Our local environment BBC website Espresso BP website  
Discovery Dog  
Thomas Edison/Michael Faraday

**Opportunities for assessment WS (Working Scientifically)**

Observations/Testing/Collecting data and feedback through different types of enquiry

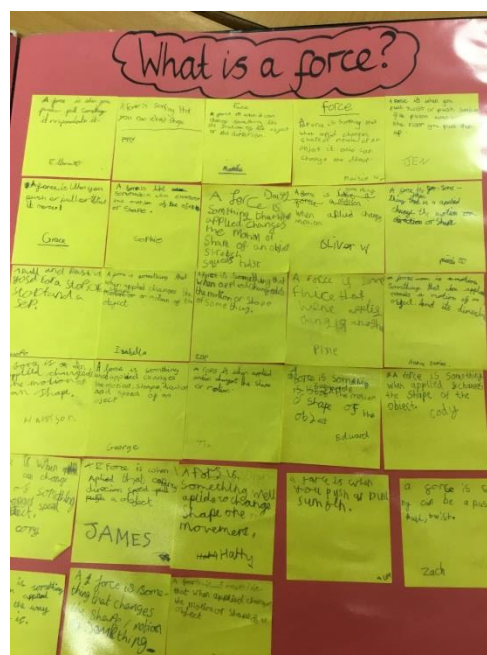
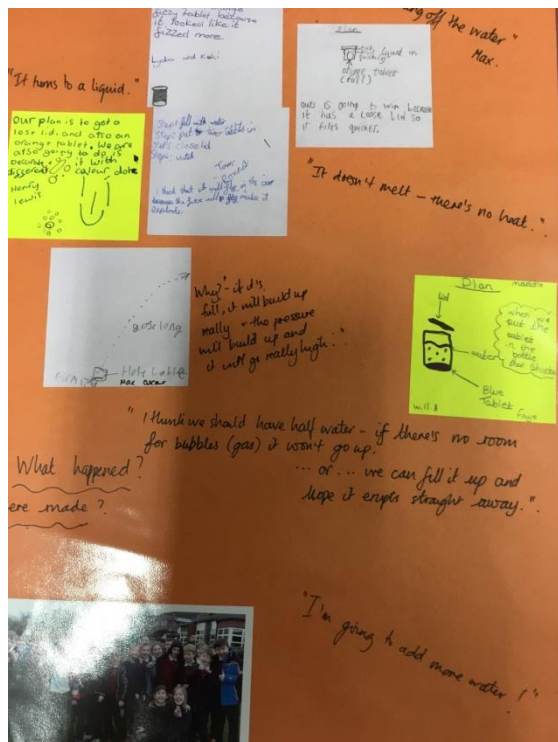
Main learning objective taken from the science curriculum	Question/Challenge	Type of scientific enquiry	Activity	Outcome
Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.	How do we use our bodies?  What are the different parts of our bodies called?	Practical involvement  Observation	Song – I've got a body, a very busy body/Heads shoulders knees and toes/The okie kokie Draw around the outline of a child lying down. Use labels to identify different parts of the body including actions you can do with them using the songs to help.	To be familiar with different parts of the body through song and practical activities and to know what they can do.
Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.	What is inside our bodies? What do our bones do? What are our 5 senses?	Observation Research  Using their observations and ideas to suggest answers to questions	Read the story Funnybones. Song "Have you seen the ghost of Tom?" Look at the school skeleton and pictures of x-rays. Name some simple bones in the body. Senses workshop! Set up different stations where the children need to use their senses. Senses match.	To have some understanding about our bones and skeleton. To know our 5 senses and how we use them.
Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.  Gathering and recording data to help in answering questions.	Are we all the same?  Do all children like the same things?  Do all children with brown hair have brown eyes?	Pattern Seeking  Data collecting	Discussion about what we like and dislike. Play a game – stand on the red spot if you don't like and the blue spot if you do like. Then suggest different things for the children to respond to.  Collect data depending on the criteria chosen. Discuss options with the children which they can choose from. Hand printing/Palm sketching	To understand that we like different things and we are all individual  To work independently to collect and present data in a simple way.

## Teaching and learning

Teachers plan science into their themes where possible for each term using the long term plan. The science stimulus might be from a school visit, a story, picture or a famous person. The teaching of science is done on a weekly basis in year groups relating to KS1, lower KS2 Year 5 and Year 6 which corresponds with our long term plan (subject to changes as children move up the school and year groups change)

At Clee Hill Community Academy we record all of our science work in big books. The children work collaboratively on activities and enquiries. Their contributions are recorded and teachers annotate work to show understanding, identify areas for improvement and assess progress.

Questions are posed to extend thinking and learning and children are encouraged to feedback to one another. All contributions are valued and the children respect one another's work.

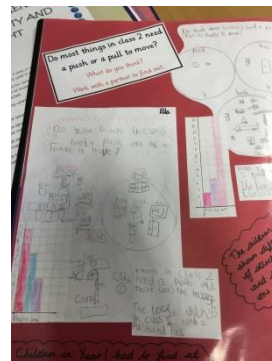
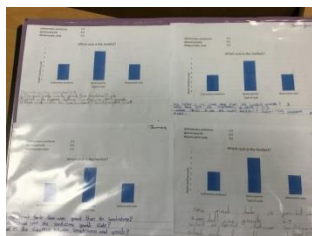
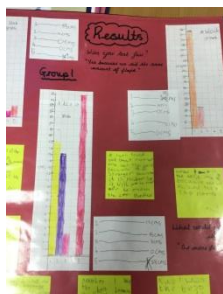


Science is a collaborative subject where the children share ideas and move forward in their thinking by talking through their ideas, noting down those ideas, and building on their existing knowledge and skills.

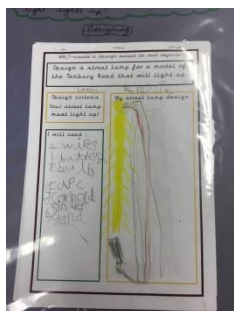


## Cross Curricular

Science offers the opportunity to engage in other areas across the curriculum and it is important to embed these in science. English plays a vital role where the children use extensive speaking and listening skills to discuss and explain concepts as well as recording their work in a variety of ways. Data handling and recording results in tables, charts and graphs exposes the children to maths where they are encouraged to interpret data.



Many of our Design and Technology topics are closely linked to science and can be taught alongside one another.



As a staff we have looked at science and the creative curriculum where the stimulus of art, music and dance can be used to introduce, enhance and embed and consolidate science concepts and skills.

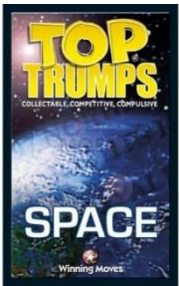


We give our children the opportunity to experience "Forest School" and teachers often plan science which can be done in the outside environment.



## Science and reading

The children use their reading skills during every science lesson. The Discovery Dog stories contain text for children to follow the stories and pose questions for them to think about. Books for research are available in the school library, covering all topics for the children to find out about and record in booklets, leaflets, posters and glossaries. The children also enjoy making games to enhance their knowledge where reading is required, for example “Heads Up” “Top Trumps” and “Spin the Spinner”. Questioning is key in science and to develop independence from an early age questions are written for the children to answer and share with the rest of the class. Ultimately the children enjoy reading through their science Big Books and they often look back at completed books throughout the year.



The children are also given the opportunity to be involved in the Heart Start program which is delivered by members of staff who have done the Heart Start training. This is done at KS1 and KS2 with appropriate life-saving skills taught at an early age.



As a school in a multi academy trust we have formed strong links with the local secondary school in the MAT. The STEM coordinator for the MAT plans activities throughout the year where children are able to visit the secondary school or teachers come to us to deliver exciting STEM activities for all year groups.



## Assessment and Monitoring

At Clee Hill Academy we use the Primarily Science progress tracker which is designed to work with the “mastery” model of curriculum delivery. The tracker provides information needed to track pupils’ progress in science learning. Teachers ensure that breadth and depth in a topic is taught. Children are able to work beyond the nation standard in “Working Scientifically” only.

Class Record to use with Science NC at Year 1

Primarily Science

Working towards National Standard

Working beyond National Standard (Working Scientifically only)

NAME	Seasonal Changes		Animals, including humans		Everyday materials		Plants		Overall (Y1=On track to meet National standard)	
	WS	K	WS	K	WS	K	WS	K	WS	K
WS focus										
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										

Pupils performing below expectation in National Curriculum Science Knowledge content (Y1).

Unit	Curriculum content	Notes on pupils
Seasonal changes	observe changes across the four seasons observe and describe weather associated with the seasons and how day/length varies	
Animals including humans	Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals (including pets) Identify and name a variety of common animals that are carnivores, herbivores and omnivores	
Everyday materials	distinguish between an object and the material from which it is made compare and group together a variety of everyday materials on the basis of their simple physical properties	

Pupils performing below and beyond expectation in National Curriculum Science 'Working Scientifically' knowledge content (KS1) in Y1

Working Scientifically	Notes on pupils below expectation	Notes on pupils beyond expectation
<b>Plan</b> asking simple questions and recognising that they can be answered in different ways		
<b>Do</b> observe closely, using simple equipment perform simple tests identify and classify		
<b>Record</b> gather and recording data to help in answering questions		

“Big Book” trawls are done each term and feedback given to ensure ongoing, high quality teaching of science

## Early Years Foundation Stage

Important science skills are addressed through Physical Development, Understanding the World and Expressive Arts and Design. It is also part of the Characteristics of Learning that are an essential part in the early years curriculum.

Pupils learn through practical activities and are given opportunities to develop and explore skills through both directed adult led activities and child initiated play. They have access to a rich, stimulating environment which encourages exploration, problem solving, prediction, critical thinking, decision making and discussion.

We have introduced a science program in Reception and KS1 which encourages children to solve problems in science using puppets and stories. The “Problem Pup” and “Discovery Dog” series introduces children to real life problems to solve which involve all aspects of the National curriculum and early learning goals. The series uses templates for the children to experience discussion, predicting, testing and recording at an early level and introduces them to the different types of scientific enquiry at a simple level.

