Clee Hill Community Academy Science Policy

Written by:	Julia Hilton
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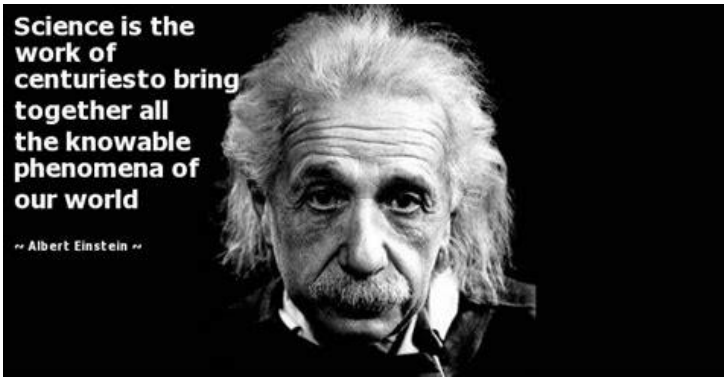


At Clee Hill Academy we aim to encourage our children to develop their curiosity of the world around them, providing first hand experiences to help develop enquiring minds through questioning, discussion and collaboration. We aim to provide access for all children in science through practical, meaningful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

Science is important at Clee Hill Community Academy. The teaching of science builds on the natural curiosity children are born with and it is our intent to foster this curiosity within the pupils by developing their understanding of the importance of scientific discoveries throughout history, for example: Newton's discovery of gravity; Darwin's theory of evolution, and many more! The teaching of science provides pupil's both substantive knowledge, where they learn the products of science (such as models, laws and theories), and disciplinary knowledge, where the children understand the practices of science and how theories can be supported with evidence. The importance of science is shown at Clee Hill Community Academy, by being placed as a key element within the Foundations aspect of our curriculum.

Intent

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.

In science, children need to develop their knowledge in a structured and organised way, to limit working memory overload which in turn will lead to long-term retention of knowledge. To further aid in this, our curriculum at Clee Hill Community Academy is sequenced to reveal the slight interplay within both substantive and disciplinary knowledge – this not only develops their knowledge and understanding of science concepts, but also the evidence for it. As the children progress through their journey of science, we

aim for children to develop upon their existing skills and knowledge which can then be spread across other areas in the curriculum. Our curriculum aims to broaden the children's understanding of scientific processes which will in turn help them to understand the natural world around them for life.

Our three principle aims for pupils in science at Clee Hill Community Academy are:

- to have good scientific knowledge and conceptual understanding of biology, chemistry and physics.
- to develop scientific skills through different types of science enquiries to help them answer 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

Based upon the National Curriculum and the individual needs and starting points of our children, we use the PLAN Primary Science curriculum progression map which maps through the use of composites and components, showi8ng individual objectives taught in each year group and the knowledge the children are expected to learn and retain by the end of KS2. At both Key Stages, the 'sticky knowledge' takes full account of the National Curriculum's main characteristics of:

- Physics
- Chemistry
- Biology
- Working scientifically

These are further intertwined with the following distinctions: - Substantive knowledge (the products of science such as concepts, laws and theories) - Disciplinary knowledge (how scientific knowledge is generated and grows). And working scientifically through: 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?

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?

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?

Organisation

Due to the make-up of cohorts at Clee Hill Community Academy, a cycled approach to coverage was developed to ensure that all children have access to the entire science curriculum throughout their primary education. Some objectives are repeated over a two year period and a different context of Science will be used to rehearse and embed key knowledge. The units identified and planned for in our science curriculum have been structured within the school's long-term plan with meticulous consideration. Not only has this been considered to ensure coverage, but it is also planned in a way that offers the children a good foundation for securing substantive knowledge and conceptual understanding. As the children progress through both individual academic years and the entire primary curriculum, we expect the children's understanding of vocabulary and abstract ideas to develop in such a way that it becomes stored within their long-term memory and thus the science units are placed on our curriculum to add a further developmental undercurrent to teaching. We understand that repeated exposure to taught knowledge and skills are key for children's long-term success in science.

All staff delivering science are to plan an introductory session before the commencement of each new unit, recapping previously taught knowledge. This is to aid in the retention and for the children to form links in their learning both from that year's units and knowledge taught in previous years in order to ensure long-term retention of skills and knowledge.

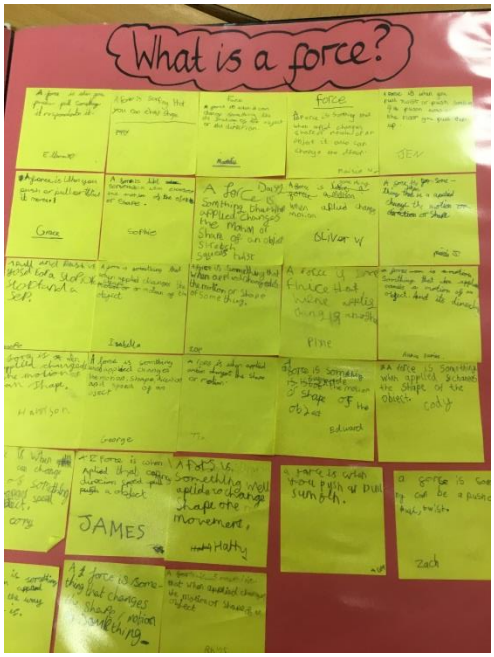
Vocabulary

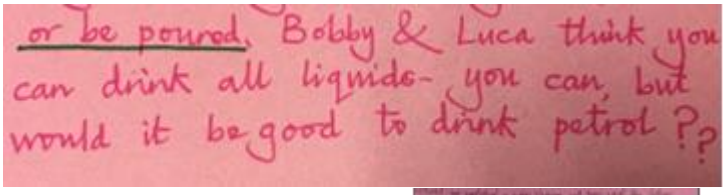
Vocabulary in science at Clee Hill Community Academy is taught both discretely and directly. Teachers use key questioning and provide opportunities for discussion throughout all units taught in order for children to acquire new terminology and, in turn, use it effectively in both writing and verbalisation. Key scientific terms (from the PLAN knowledge matrixes) are revisited regularly, to ensure learning is memorable, relevant and retrievable.

The teaching of vocabulary has been specifically designed to also take account of introducing children to specific terminology that will support future learning across the entire curriculum. Throughout the entire National Curriculum for science, the importance of spoken language in pupils' development cannot be understated. At Clee Hill Community Academy, we follow the 'Thinking, Talking, Doing' model where we develop children's confidence and accuracy when using science specific language and their ability to articulate science concepts clear and concisely.

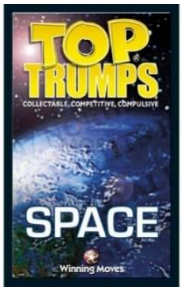
Recording Science

At Clee Hill Community Academy we record all of our science work in big books/ floor 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.

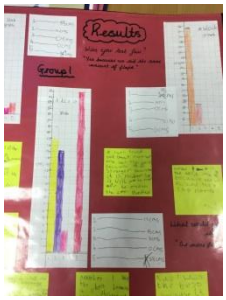




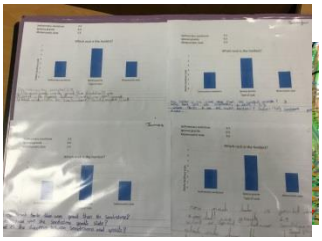
Cross Curricular



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 ad 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

At Clee Hill Community , we fully understand and embrace the importance of reading. In science, we see it as integral for children achieving their full potential and readiness for secondary science education. As the children become more secure in the phonics understanding and become increasingly competent in their ability to read, they will become exposed to a wider selection of literature to support the teaching of science. In doing so, it is our aim that the children become more exposed to the scientific terminology and disciplinary vocabulary they require in order to be successful, as doing so will enable an academic

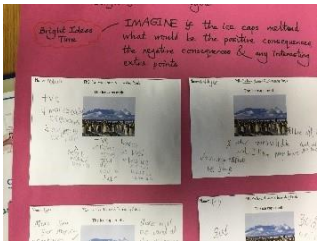
understanding that will better prepare them for their secondary education. Teachers should aim for a reading opportunity in ever lesson. High quality non-fiction science texts will be updated annually with the support of the English subject leads. The Discovery Dog stories contain text for children to 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.

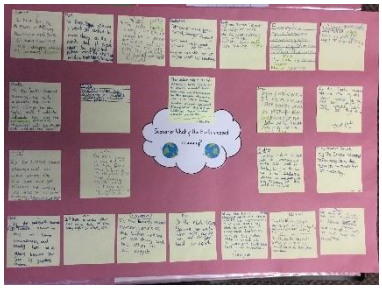
Thinking Doing Talking Science

Focuses on developing creative and challenging science lessons that encourage pupils to use higher-order thinking skills. TDTS teachers enable their pupils to think and talk about scientific concepts through dedicated discussion times, they provide them with a wide range of opportunities for creative investigations and problem solving and they focus pupils' recording so that is there is always time for practical science.

Bright Ideas Time

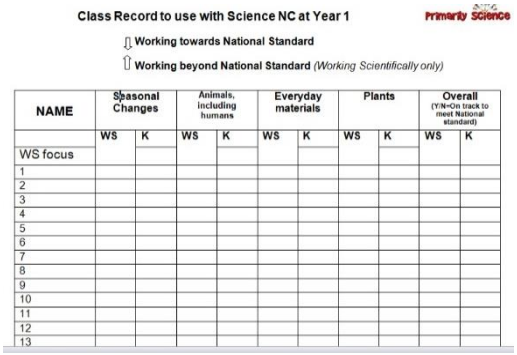
This is a great way to get children engaged and talking about science. Every class uses Bright Ideas Time as a stimulus in every lesson. This can be one of the following activities :- Odd One Out, Zoom in Zoom out, PMI – positive minus interesting or The Big Question.





Enrichment opportunities

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.



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 (Y/N=On track to meet National standard)	
	WS	K	WS	K	WS	K	WS	K	WS	K
WS focus										
1										
2										
3										
4										
5										
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Assessment and Monitoring

Assessment for learning is continuous throughout all delivery of science, through the entire planning, teaching and learning cycle. At the end of each unit, teachers assess the evidence they have gathered about pupils' acquisition of key knowledge set out in our curriculum. This is to identify what each child knows about the unit covered at its completion to ensure progression in following units as they progress through their journey in primary science. 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. "Big Book" trawls are done each term and feedback given to ensure ongoing, high quality teaching of science. We use the PLAN primary science resources to support judgments with their examples of work that meet the expectations of the knowledge statements for each topic from each year-group in Key Stages 1 and 2 of the National Curriculum. This support teachers to assess their pupils consistently

Science in the Early Years

Following the EYFS framework, we ensure that we provide the children in EYFS a range of experiences which increases their understanding of themselves, the world and their place within it. We aim to achieve this by offering opportunities for the children to explore the natural world, learning about the seasons, and scientific enquiry. By the end of their EYFS learning, we expect the children to be confident in their understanding and with their arsenal of vocabulary they will develop, which in turn will aid their transition into KS1 science.

As part of our EYFS curriculum, there are milestones which have been carefully constructed with an end goal, to reflect our own dynamics and environment to meet our children's needs, whilst ensuring a stimulating, challenging and diverse curriculum. Although many aspects of the Early Years Curriculum develop a solid understanding for Science in Year 1, '**An Eager Explorer**' is of particular importance to show the progression of learning through Nursery and Reception. **EYFS Curriculum milestones and goals**

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.

Impact

The impact of our curriculum is that:

- Our pupils love Science and can explain the importance of the subject in their everyday lives. They can also explain how the subject will help them in their future careers.
- Pupils’ attainment is in line with national expectations and pupils are prepared for the next stage of education.
- Pupils have the knowledge and skills needed that allow them to go on to destinations that meet their interests and aspirations.
- Our teachers have high expectations for every pupil which is evident throughout the high standard of work which pupils clearly take pride with.
- Our teachers have good subject knowledge and plan well-structured lessons that build on prior learning.
- Subject leaders have a clear understanding of the schools’ strengths and the areas of improvement – all staff have a consistent drive to ensure pupils are the best they can be.