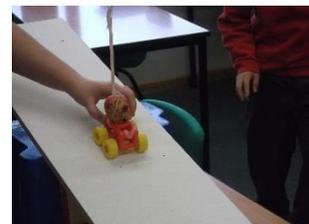
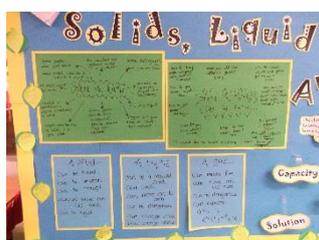


Hempshill Hall Primary School



Science Policy

Up dated January 2017

Review date December 2020

The Importance of Science and how it contributes to children's education - Mission Statement

At Hempshill Hall Primary School it has always been believed that science education has an important part to play in the development of the individual as a whole. Science permeates almost every aspect of our daily lives, and each of us needs to bring a scientific approach towards the consideration of practical, social, ethical, technological, economic and political issues in today's world. Science education at Hempshill Hall Primary contributes to the preparation of young people for adult working life as well as for their intellectual development.

We believe that science should encourage curiosity and healthy scepticism, respect for the environment, critical evaluation of evidence, an appreciation of a significant part of our cultural heritage and an insight into our place in the Universe. With all this in mind, Science at our school contributes to cross curricular studies and to a broad and balanced curriculum.

Principles of Science Teaching at Hempshill Hall

To ensure we have a common view and shared understanding of how our mission statement will transfer into our every day teaching, staff and children were asked to write down their answers to the following question?

'We know good science occurs in our school when....'

These answers were analysed and ranked and have become the Principles of our science teaching.

1. Children are asking questions and they are eager to find out more.
2. Learning is 'hands on' and active and all children are involved and motivated.
3. Children are excited by their learning and they talk about it at school and home.
4. Children are able to lead their learning and follow and test out their own ideas.
5. Children are able to make links and connections between their learning and transfer and apply knowledge from other areas of the curriculum and the wider world.
6. Children can use a wide range of scientific vocabulary to verbalise and explain their ideas and findings clearly.
7. Investigations are varied, open ended and are accessible to all, but have scope for high level challenge.
8. The outdoor environment is included in children's regular science work
9. When children have emotional responses to the work they do 'wow' moments or awe and wonder and natural phenomena is appreciated.
10. Children can use a wide range of equipment effectively and confidently.

These outcomes were then shared with the Head teacher and the SLT and we agreed that they should underpin our new mission statement. Whilst we are very aware that there are skills, vocabulary and content to be taught in Primary Science the staff have clearly

recognised that the way to achieve this is for science teaching to be 'hands on' and relevant to the children at all ages. Children are clearly being encouraged to make cross curricular links and apply their learning in engaging and meaningful ways. Children are to be given opportunities throughout school to initiate and extend their own learning. We must value these principles and ensure that they are evident in our planning and teaching. These Principles have been revised in October 2016.

Aims

Our aims in teaching Science are that children will:

- Develop an active interest in science and enjoy Science based activities
- Gain a secure foundation in scientific knowledge, understanding and skills.
- Develop the confidence and ability to apply their scientific knowledge and skills to everyday life and to all areas of the curriculum.
- Develop confidence, initiative and perseverance when tackling problems and exploring new situations
- Gain experience of working co-operatively towards a common goal giving consideration to others.
- To increase the child's knowledge and understanding of the world and for them to understand the effects of their actions on the environment.

Planning

Foundation stage

Long term planning for Foundation 1 and 2 follows the EYFS curriculum for 'Understanding the World'. Each half term the children have a new exploration and investigation focus. The Foundation planning also allows for different skills within the knowledge and understanding of the world curriculum to be rotated and revisited each half term.

Key stages 1 and 2

The science curriculum follows the statutory Programmes of study which are set out in 'The National Curriculum'. Each year group has specific areas to cover and this includes working scientifically. The Programme of study, is seen as the minimum and we aim to offer an even broader science curriculum within school.

We aim to split teaching 50:50 between working scientifically and knowledge.

Within each topic, staff are expected to develop the children's scientific knowledge and understanding, process skills and attitudes to science.

The Programmes of study also ensure children make progress as they move through Key stages 1 and 2. The Science units are outlined for each term over the year and are available on the long term planning sheets. We have more detailed progression sheets for each topic.

Medium term planning for Science is based on clear and precise learning objectives and these are handed into the Head Teacher and displayed in the workroom. These plans give an overview of the unit of work and show cross curricular links. Teachers are encouraged to be creative in their delivery of science and they are to develop opportunities for child led investigations.

Short term planning is done on a weekly/daily basis. It breaks down the medium term planning and is objective based taking account of differentiated activities and use of support.

Teaching and Learning (Objectives)

All lessons have clear learning objectives which are shared and reviewed with pupils effectively. A variety of strategies, including questioning, discussion, concept mapping and marking, are used to assess progress and plan the next steps in learning.

We are guided by the view of Science outlined in the National Curriculum:

"Science stimulates and excited pupils' curiosity about phenomena and events in the world around them. It also satisfies their curiosity with knowledge. Because Science links direct practical experience with ideas, it can engage learners at many levels. Scientific method is about developing and evaluating explanations through experimental evidence and modelling. This is a spur to critical and creative thought. Through Science, pupils understand how major scientific ideas contribute to technological change - impacting on industry, business and medicine and improving the quality of life. Pupils recognise the cultural significance of Science and trace its world-wide development. They learn to question and discuss science-based issues that may affect their own lives, the direction of society and the future of the world." (National Curriculum 1999 p.76)

In the Foundation Stage the children follow the EYFS curriculum through which science objectives are met in the area of 'Understanding the World'. Children are engaged in topic related learning and discovery where opportunities are planned for them to find out about the world in which they live through exploration and experimentation. Activities are planned to encourage the natural interest and curiosity of the children allowing them to use all of their senses to notice similarities, differences and change. Children explore science in and outside the classroom. Forest school activities in the local wood and school grounds provide excellent opportunities for the children to explore Science in a more concrete and practical way.

The new curriculum is broken down in to three broad programmes of study Year 1/2, Year 3/4 and Year 5/6. It is expected that knowledge will be embedded and skill built upon in each phase. Working scientifically has 5 broad strands and each one must be planned for and developed during each phase.

- observing over time (putting a rich tea or fruit shortcake in hot water and observing the changes)
- pattern seeking (is there a pattern between fat and calories in biscuits?)
- identifying, classifying and grouping - (making a branching diagram to sort the biscuit variety box)
- fair testing (which is the best dunking biscuit?)
- researching using secondary sources (how do they make jammy dodgers?).

Phase 1

- Can ask simple questions.

- Recognise that questions can be answered in different ways – observing closely, using simple equipment, carry out simple tests.
- Can use observations and ideas to suggest answers to questions.
- Can decide how to sort and compare objects, material and living things.
- Can gather simple data to help answer questions.
- Begin to recognise patterns and relationships.
- Can record observations using different senses.
- Can carry out a simple test.
- Can use simple secondary sources to find answers to questions
- Can use simple equipment – egg timers, hand lenses to collect data.
- Record data in simple forms.
- Can talk about what they have found out and how they found it out.
- Communicate findings in a range of ways (with help) – discussion, pictures or writing.
- Begin to use scientific language

Phase 2

- Ask relevant questions.
- Begin to make their own decisions about the types of scientific enquiry which will be most appropriate to answer questions.
- Begin to set up simple practical enquiries to answer questions.
- Recognise when a simple fair test is necessary and help decide how to set it up.
- Can talk about criteria for grouping, sorting and classifying.
- Can use a simple key.
- Can recognise naturally occurring patterns and relationships and decide what data to collect to identify them.
- Can make decisions about what observations should be made, how long for and what simple equipment should be used.
- Can use new equipment such as data loggers appropriately.
- Can collect data from their observations.
- Can take accurate measurement e.g. thermometers.
- Can make simple notes.
- Create simple tables and use standard units of measure.
- Make decisions about how to record findings – drawings, labelled diagrams, keys, bar charts and tables.
- Report findings from enquiries, including written and oral explanations, displays of presentations of results and conclusions.
- Can use findings to draw simple conclusions, make predictions for new values, suggesting improvements and raise further questions.
- Can identify differences, similarities or changes related to simple scientific ideas and processes.
- Can use straightforward scientific evidence to answer questions or to support their findings.
- Can recognise when a secondary source would be helpful.
- Can communicate using relevant scientific vocabulary.

Phase 3

- Can plan different types of scientific enquiries to answer questions.

- Can recognise when and how to set up comparative and fair tests and explain which variables need to be controlled and why.
- Can take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings where appropriate.
- Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables and bar and line graphs.
- Can use test results to make predictions to set up further comparative and fair tests.
- Can decide how to record data from a choice of familiar approaches.
- Can look for different causal relationships in their data and identify evidence that refutes or supports their ideas.
- Can use results to identify when further tests and observations might be needed.
- Can begin to recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact.
- Present findings and data in a variety of ways, including oral and written forms.
- Use relevant scientific vocabulary and illustrations to discuss, communicate and justify their scientific ideas.
- Talk about how scientific ideas have developed over time.

Science across the curriculum

Although the Science curriculum is organised as a discrete subject, there are many potential cross-curricular activities. Making links between areas of learning deepens children's understanding by providing opportunities to reinforce and enhance learning.

Learning is enhanced by:

- Giving further opportunities to practise taught skills through purposeful use in other curriculum areas
- Providing real experience, context and meaning for the development of core scientific skills
- Assisting memory through providing opportunities for children to use and apply skills in a different context
- Providing opportunities for the application of knowledge in new contexts, to involve children in higher order thinking skills, such as reasoning, evaluation and analysis
- Building concepts by providing children with opportunities to meet the same or related information in different ways, adding to the richness of their experience.

The Learning Environment

To show that science is a valued subject there will always be a whole school science display showing the type of work that is happening across the school. Every class is expected to have some sort of science display, it may be cross curricular, and topic vocabulary is prominent. Its profile should reflect its place as a core subject. During the first part of the Spring term the school holds a 'Science Fortnight'. The focus of this is to develop 'Working scientifically' skills and all the children take part in workshops and investigations. Outside providers come into school to deliver new experiences for the children and provide CPD for the staff. Parents, Grandparents and other family members are invited into school to support their children and

see the learning opportunities the children experience. Learning is expected to happen in and outside of the classroom in order to teach the curriculum content fully. Weekly gardening sessions have been included in the Year 2 and 4 curriculum and Hempshill Zoo provides real animals and birds for the children to study.

As a school who are proud to hold the Gold PSQM (Primary Science Quality Mark) we are dedicated to supporting science development within the local and wider community. We work with other schools and Nottingham University to share our knowledge and offer CPD and practical support.

Monitoring and Evaluation

The purpose of monitoring and evaluating activities is to monitor the quality of teaching and learning, standards and curriculum coverage for progression and continuity across the school. The Science Coordinator monitors the quality of teaching and learning and this is shared with the SLT. This will include:

- Scrutiny of planning and work book analysis
- Principles are on display in every classroom.
- Ensure marking is supportive and in line with the school's marking policy
- Regular learning walks to check science displays are evident and current vocabulary is prominent
- Quality of teaching and learning through lesson observations and feedback
- Areas for development, these can be individual or whole school, are identified and the class teacher is responsible for 'actioning' by the agreed deadline
- Moderation of standards in children's work
- Tracking children's progress from F2 to 6
- Evaluation of children's attainment against local and national targets
- Ensure actions highlighted on the School Development Plan are implemented
- Feedback to SLT and governors

The subject leader plays an important role in developing their subject across the school as determined by their job description.

Assessment opportunities

All children's work is marked in order to inform planning and set targets for development. Formative and summative teacher assessment forms a large part of this. We ensure that our expectations do not limit pupil achievement and assessment does not involve cultural, social, linguistic or gender bias.

Key Stages One and Two

Assessments take place at the end of each topic and should help inform how individual children are progressing. Staff are encouraged to complete an initial assessment at the start of a topic. This may be a mind map demonstrating what they already know about a subject.

"Learning outcomes in each unit show how children might demonstrate what they have learnt. The learning outcomes themselves will serve as a record for classes working on each unit. It is not necessary to make detailed records for each child in relation to these outcomes. The end-of-unit expectations provide broad descriptions of achievement within each unit and

should help teachers to decide where a child's progress differs markedly from that of the rest of the class. Teachers may wish to make a note of this, and of the reasons for the difference to pass on to the next teacher."

Our current assessment procedures in Key Stage One and Two include:

- IEP's for SEN children.
- On-going informal teacher assessment and then levels are recorded on class tracker.
- YR 2 and 6 end of Key Stage Teacher Assessments for the LA
- Biannual WS assessments in order to track progress .
- Whole school WS investigation with all work levelled, moderated and recorded on class tracker.
- Children are encouraged to use self assessment on their work and this is done in a variety of ways including the triangle system and Pip Wilson 'Blob Tree'.

Teachers are also to make a judgement and record children's end of topic attainment with either national standard met, not met, exceeded on a class tracker. This record is on the server and is available for the next teacher. The Science leader and the Head Teacher will complete an end of year analysis.

The end of unit assessments will not only provide receiving teachers with valuable information but can be used by class teachers to assist end of year reports to parents.

Foundation Stage

Science objectives are met in the EYFS area of 'Understanding the World'. Children are assessed against the Early Learning Goals whereby teacher assessments are based upon informal and formal observations as well as focussed activity work.

Resources

An annual Science budget is set and made available for the subject leader to order new resources and the staff are encouraged to ask for any equipment or resources they will require.

Science resources are centrally stored in cupboards and labelled trays. There is a specific 'Science Area' which is well stocked. All resources are monitored and maintained termly by the Science co-ordinator in consultation with staff.

Through discussion with staff the science co-ordinator should identify the need for ordering of new equipment, particularly where new initiatives or curriculum changes are taking place.

Health and Safety

Science is taught in line with our general Health and Safety Policy.

Vigilance is needed when children are engaged in a range of practical activities, including open-ended investigations, where there is the possibility that something could go wrong.

Individual teachers will need to undertake their own specific risk assessment.

The 'Be Safe! (ASE 2012) book is freely available for staff to read before carrying out investigations.

The governing bodies code of practise for Health and Safety in Primary Science is encompassed in the booklet 'Be Safe! A copy of this booklet is kept in the Science resources area. This booklet is updated as a new one is issued and stuck in a wallet on the inside of the science cupboard.

All staff are expected to be familiar with its contents and follow its guidance. New staff members are given an induction by the Science coordinator to ensure they are clear about safety procedures.

Equal Opportunities

All groups of children will be provided with differentiated learning opportunities which enable them to experience success, gain confidence and acquire competence. The Science curriculum should fulfil the needs of all pupils. Children with IEP's will have targets identified and supported and where necessary have additional adult support.

We aim to teach science in a broad global and historical context, using the widest possible perspective and including contributions of people from many backgrounds. We recognise the particular importance of first hand experience for motivating children with learning difficulties and that science may strongly engage our gifted and talented children, and we aim to challenge and extend them.

Sally Dakin 2017



A selection of 'Family Homework' Jan 2017