

Science

Science Subject Leader: Helen Bailey

Subject Intent:

In science we aim to ensure that all pupils develop scientific knowledge and conceptual understanding in the three areas of science; biology, chemistry and physics. We plan a range of scientific enquiries which help the children to understand the nature, processes and methods of science and will provide an opportunity for the children to answer scientific questions about the world around them. We aim to equip the children with the scientific knowledge required to understand the uses and implications of science both for today and in the future. This work is taught through the units of work identified in our whole school science long term plan (Curriculum Map) – see attached.

Subject Implementation:

The school has a bespoke Scheme of Work where objectives are planned from the National Curriculum and are implemented across the whole school. This is enhanced by resources from 'Exploring Science' and 'Hamilton Trust'.

Resources and location: Science cupboard located in the Year 2 classroom. Boxes of resources are organised in to topics. A selection of books are also kept in the science cupboard including concept cartoons. Additional resources can be loaned from Holmes Chapel High School (staff to contact the science department at the school to arrange to pick up relevant equipment).

Teaching sequence: EYFS - Science is covered within the specific curriculum area 'Understanding the World' ('The World' strand). Years 1 -6 follow The National Curriculum for science (2014). Each year group covers specific units of work set out in the National Curriculum and is written into our science curriculum map (see attached). Years 5 and 6 are trialling an interleaving approach where they keep revisiting each unit of work each half term with the aim of improving the children's memory of key facts and vocabulary. Knowledge Organisers have also been introduced across all years to aid the children's memory which are A4 mats containing key facts and any key vocabulary to be taught in a unit of work.

Where is pupils' work recorded?: In Reception children's work is recorded in their topic books. In Years 1-6 children's work is recorded in their green science book (Y5 and Y6 have 6 smaller books/files to accommodate their interleaving units of work). Progress can be seen when looking in pupils books and through pupil voice and classroom observation. Teachers deliver regular science investigations (key assessment tasks) so that pupils can demonstrate progress they have made and judgements can be made on their attainment in relation to success criteria (working below, at, or above end of year group expectations).

Extra-curricular opportunities: Celebration of National Science and Engineering Week (March, usually annually), hatching of chicks (Reception and/or Year 6), whole school competitions – Marble Run (winners visited the Sound Lab at Arup in Manchester; What will be on the moon in 50 years time? (winners visited the Liverpool Arup office and made 3-D virtual models then were invited to The Blue Dot Festival at Jodrell Bank).

Trips and visitors: EYFS/KS1 trips have included Underwater Street, Blue Planet Aquarium. KS2 trips have included The Science and Industry Museum (Manchester), Techniquet, Burwardsley residential, Jodrell

Bank. Visitors have included Lorelly Wilson (Chemistry with Cabbage and Electricity Day – Y5 and Y6), Water Workshop (United Utilities – Y4), Den building, Zoolab, various parents with scientific jobs (during National Science and Engineering Week), science competition winners visited the Arup offices in Manchester and Liverpool and attended The Blue Dot Festival.

Long Term Plan: See attached Science Curriculum Map.

Access for SEN children: The science objectives have been planned and adapted to enable all pupils to access the content of the science curriculum. We use Quality First Teaching to ensure all pupils make progress according to their need and starting point. End of unit assessment grids are used to identify any required next steps, highlight any vulnerable groups and support interventions as appropriate.

Subject Impact:

Standards: Termly assessment grids completed by all staff which plots children's attainment against their predicted FFT band (below, at or above expected attainment). This then identifies if children are on track or above the end of year expected standard. Next steps can then be planned in to ensure the children make progress. This is then passed on to the next teacher to ensure continuity.

Assessment: In Early Years /Reception the EYFSP is used to assess children on entry, to track children's progress throughout the year and to complete the statutory end of year assessment. In June children's attainment in the Early Learning Goals (ELG 14 - Understanding the World – 'The world' strand) is assessed as being Emerging, Expecting or Exceeding. Teachers in Years 1-6 will use focussed assessment tasks (approximately half termly based on Bath Spa University project) to decide if children are working below, at or above the end of year expectations for their year group.

Children take optional past paper tests in science at the end of KS2 and teachers make an assessment of the children's work in science at the end of KS1.

Limitations:

The limitations of these assessment tasks are that they are often only testing specific key objectives for that year group and therefore it may be more difficult to track progress in certain areas from year to year. The assessment of the 'working scientifically' skills is easier to track and is built in to the assessment tasks where possible.

What is this information used for?:

Teachers will use success criteria linked to each of the assessment tasks to make their judgements. This information is then recorded on a Termly Assessment grid where staff can track pupils' progress in relation to their FFT band. Teachers will then use this information to identify any vulnerable children and to plan any next steps that need to be taken to ensure progress is made. The assessment data is monitored by the science subject leader annually to get an overview of the standards met in science across the school and during end of year transition meetings, teachers will let the next class teachers know of particular year group strengths or target areas to focus on.

Opportunities for:

- English - Science contributes to the teaching of English in our school by actively promoting the skills of reading, writing, speaking and listening. Some of the texts that the children study in English are

of a scientific nature. The children develop their oral skills in science lessons through discussions and through recounting their observations of scientific experiments. They develop their writing skills through writing reports and projects and by recording information.

- Maths - Science contributes to the teaching of maths in a number of ways. The children use weights and measures and learn to use and apply number. Through working on investigations they learn to estimate and predict. They develop the skills of accurate observation and recording of events. They use numbers in many of their answers and conclusions. The children make strong links with science and maths in their handling of data. They produce a variety of graphs and charts to record their observations in science experiments.
- Computing - Children use computers in science lessons where appropriate. They use them to support their work in science by learning how to find, select, and analyse information on the Internet. Children also use computers to record, present and interpret data (e.g. dataloggers) and to review, modify and evaluate their work and improve its presentation.
- SMSC - Science teaching offers children many opportunities to examine some of the fundamental questions in life, for example, the evolution of living things and how the world was created. Through many of the amazing processes that affect living things, children develop a sense of awe and wonder regarding the nature of our world. Science raises many social and moral questions. Through the teaching of science, children have the opportunity to discuss, for example, the effects of smoking and the moral questions involved in this issue. We give them the chance to reflect on the way people care for the planet and how science can contribute to the way we manage the earth's resources. Science teaches children about the reasons why people are different and, by developing the children's knowledge and understanding of physical and environmental factors, it promotes respect for other people.
- British Values – Individual liberty of own views, tolerance and mutual respect of others views is taught through the topics where different views/ethics are involved. This includes the topics of evolution versus creation, genetic modification, selective breeding, stem cell research and animal testing. Rule of law relates to following the safety rules and alcohol, tobacco and drug use.

Health and Safety considerations: All staff have read and signed a copy of 'Be Safe', which sets out guidelines for safety procedures in all areas of science. This is kept in the science cupboard in Year 2. The Subject Leader receives the latest 'Primary Science and Technology' newsletters from CLEAPSS (and we are online members), which outlines any up-to-date health and safety issues in this subject. Any important updates are then shared with colleagues (e.g. being aware of asbestos in World War 2 gas masks after 1938, not to use child safety plug sockets etc). We have carried out a risk assessment for the subject and separate risk assessments for specific activities are produced as we feel necessary.

Helen Bailey February 2021