at

Hook Lane

Logic of Learning

Introduction

At Hook Lane we aim to ensure that children have an understanding of the world in which they live. We want them to notice their surroundings, what is going on around them and ask questions. We want them to be able to answer Scientific questions about the world using range of Scientific enquiry skills.

Science gives our children the opportunity to work collaboratively and build teamwork and communication skills. Throughout the school, children will be working together to observe, predict and make discoveries.

We follow the national curriculum for science.

Big Ideas

The ‘big ideas’ of science are revisited during a child’s time at Hook Lane. Key scientific ideas are explored and prior knowledge and understanding are built upon.

Teachers refer to the big ideas in knowledge organisers which enables prior learning to be referred back to in the most appropriate ways.

The science curriculum map shows where the big ideas are revisited throughout the school:

https://docs.google.com/document/d/1MDocf3CXhcUvVTieN--wGTPrxkMxe3qmDuI8eJDRdUQ/edit

Enquiring minds

The 5 types of scientific enquiry are:

- Comparative and fair testing
- Identifying and classifying
- Observing over time
- Pattern seeking
- Research

The skills that children will be working on developing when carrying out these enquiries are:

- Question
- Plan
- Report
- Set up and perform a test
- Observe
- Measure
- Record
- Conclude

Ideas for questions that can be used to cover the types of scientific enquiry can be found here:
https://docs.google.com/document/d/19Pm8WealTfBYGYJ-7A6k6onY8ScBPjYaYwht3sAvUEE/edit

Knowledge organisers

Teachers create knowledge organisers to ensure that they have the required subject knowledge to teach the topic and ensure that opportunities for working scientifically skills have been planned for.

Knowledge organisers include vocabulary with definitions that the children can refer to.

Knowledge organisers act as a title page and are stuck into the children's science books at the start of the topic. They are put onto google classroom so that parents can see the knowledge content for the topic.

EYFS

Understanding of the World

People and Communities:
Early Learning Goal Children **talk about past and present events** in their own lives and in the lives of family members. They know that other children don't always enjoy the same things, and are sensitive to this. They know about **similarities and differences between themselves and others, and among families, communities and traditions.**

The World:
Children know about **similarities and differences in relation to places, objects, materials and living things**. They **talk about the features of their own immediate environment and how environments might vary from one another**. They make **observations of animals and plants and explain** why some things occur, and **talk about changes.**

Technology:
Children **recognise** that a **range of technology** is **used** in places such as **homes and schools.** They **select and use technology for particular purposes.**

KS1

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.**

Lower KS2

The principal focus of science teaching in lower key stage 2 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.

Upper KS2

The principal focus of science teaching in upper key stage 2 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.

Planning

Long term and medium term science planning is completed/adapted at the start of the year.

Medium term planning includes coverage of national curriculum objectives (shown in blue) and which working scientifically skills will be covered. Ideas for activities are included but these can be modified by the teachers as and when they feel necessary or appropriate.

Working scientifically

Working scientifically skills are covered using the different types of enquiry. Evidence for these skills can be through photographs, note-taking, written work in science books, post-it notes on a display or in a shared floor book. Scientific Enquiry skills posters are displayed in classrooms and it should be clear when looking in books, which Scientific Enquiry skills the children have been working on.

Children's science books

Each lesson should clearly display a big question along with the main Scientific enquiry skills that the children will undertake in order to answer the big question. Children record their work in their own science books. This can be in the form of written work, diagrams, observational drawings, note-taking, write up of enquiries or any other way that the teacher feels appropriate. Photos of children's practical work may be stuck in science books.

The use of worksheets should be minimal. Children are encouraged to draw their own tables for recording results.

Writing in science

For each unit of work children should ‘write up’ their experiment or investigation at least once during the topic. English SPaG skills should be explicitly modelled so that children are transferring their current SPaG foci into their independent writing.

For example, in year 5, if children have been learning about modal verbs the teacher will model using modal verbs in the write up of the experiment or investigation.

Marking

As in other subjects, the focus is on live marking and feedback. There is not an expectation that every piece of work will receive a ‘deep mark’ and the teacher should aim to give live feedback by circulating during the lesson and picking up on misconceptions, giving feedback to individual pupils or sharing during mini plenaries where appropriate.

Children show their response to live feedback using their green pen.

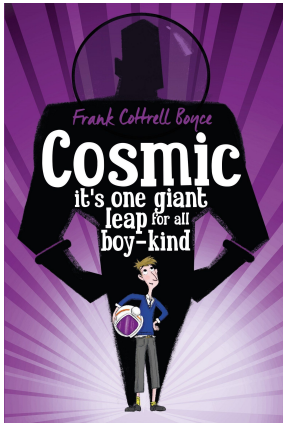
Adaptive teaching

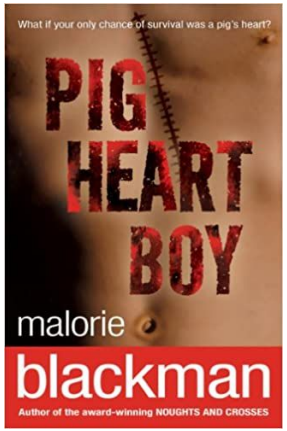
Using adaptive teaching to provide the opportunity for all pupils to experience success by adapting lessons, whilst maintaining high expectations for all. This may be through:

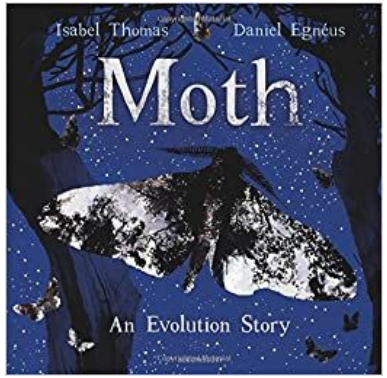
- Cause and effect activities to introduce a concept
- Retrieval questions/activities to revisit previous knowledge before introducing new learning
- Mixed ability groupings
- Sentence STEMs
- Modified tasks/learning for certain strands
- Clear visuals to support new learning
- Pre-teaching of vocabulary and concepts
- Tables/graphs provided and simplified to cover key skills/knowledge
- Scaffolded/partially completed experiment formats to focus on key skills/knowledge
- Practical/visual supports to move and touch

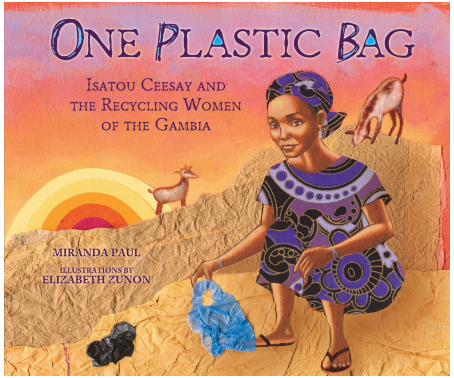
Quality texts

Teachers should aim to enhance the teaching of the science topics by using high quality texts in whole class reading lessons that link to the science unit of work.









Famous scientists

Each unit of work should aim to introduce the children to a famous scientist linked to the topic.

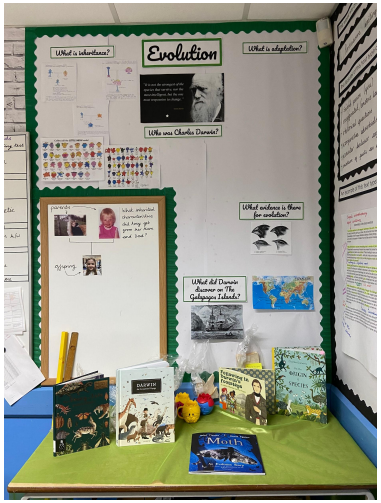
Teachers should aim to ensure that a wide range of scientists are learned about, for example, women and scientists from BAME backgrounds.

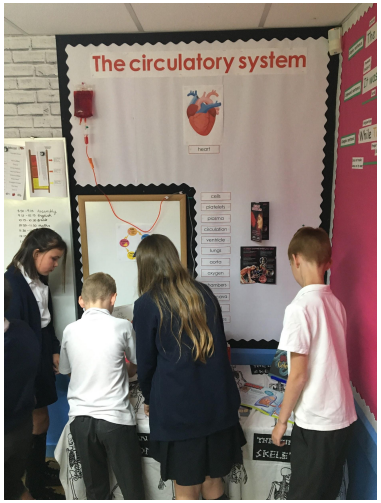
Display

Every classroom should have a high quality science display which supports the teaching of the current topic.

Displays should include big questions for the unit, Scientific enquiry skills for the lesson, vocabulary linked to the topic as well as the knowledge organiser.

Children should be encouraged to think about and discuss Science taught beyond the classroom and add to classroom displays where appropriate.





Enrichment

Teachers plan trips to enrich teaching and learning for their science topic. Visits include the Science Museum, Bodyworlds, local farms and woodlands and the IMAX. Teachers also arrange for visitors in school that help bring topics to life e.g. Living eggs, caterpillars, the big man. Children also visit Forest School in EYFS and KS1/Year 3 which supports their science learning.

STEM week promotes using working scientifically skills and the engineering approach to be used alongside maths and design technology with a whole school focus.