

# Science Policy

Addingham Primary School

6/3/2017

Agreed by the School Improvement Committee of Governors

Next Review June 2019



## **Addingham Primary School 2017 -2019**

### **Science Policy**

**Science Subject Leader – Mrs Linda Jeffreys**

#### **What is Science?**

- Developing the understanding of important scientific ideas, processes and skills and relating these to everyday experiences
- Learning about ways of thinking and or finding out about and communicating ideas
- Exploring values and attitudes through science

#### **Aims:**

At Addingham Primary School we aim to ensure that all pupils:

- Develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics
- Develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific 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

#### **Curriculum:**

A high-quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Science has changed our lives and is vital to the world's future prosperity, and all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational knowledge and concepts, pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes.

#### **Foundation Stage - Knowledge and Understanding of the World**

Children must be supported in developing the knowledge, skills and understanding that help them to make sense of the world. Their learning must be supported through offering opportunities for them to use a range of tools safely; encounter creatures, people, plants and objects in their natural environments and in real-life situations; undertake practical 'experiments'; and work with a range of materials.

## Early learning goals

By the end of the EYFS, children should:

- Investigate objects and materials by using all of their senses as appropriate.
- Find out about, and identify, some features of living things, objects and events they observe.
- Look closely at similarities, differences, patterns and change.
- Ask questions about why things happen and how things work.
- Build and construct with a wide range of objects, selecting appropriate resources and adapting their work where necessary.
- Select the tools and techniques they need to shape, assemble and join materials they are using.
- Find out about and identify the uses of everyday technology and use information and communication technology and programmable toys to support their learning.
- Find out about past and present events in their own lives, and in those of their families and other people they know.
- Observe, find out about and identify features in the place they live and the natural world.
- Find out about their environment, and talk about those features they like and dislike.
- Begin to know about their own cultures and beliefs and those of other people

## Key Stage 1

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.

Pupils should read and spell scientific vocabulary at a level consistent with their increasing word-reading and spelling knowledge at Key Stage 1.

## Key Stage 2

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.

Pupils should read and spell scientific vocabulary correctly and with confidence, using their growing word-reading and spelling knowledge.

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.

Pupils should read, spell and pronounce scientific vocabulary correctly.

### **Teaching and Learning in Science**

All lessons need clear learning objectives which are shared and reviewed with the pupils effectively. A variety of strategies, including questioning, discussion, concept mapping and marking, are used to assess progress. The information is used to identify what is taught next.

Activities need to inspire the pupils to experiment and investigate the world around them and to help them raise their own questions such as “Why..?”, “How..?” and “What happens if..?” We believe in pupil led enquiry where possible with children designing their own learning.

Activities need to develop the skills of enquiry, observation, locating sources of information, selecting appropriate equipment and using it safely, measuring and checking results, making comparisons and communicating results and findings.

Lessons must make effective links with other curriculum areas and subjects, especially English , maths and ICT. Activities should be challenging, motivating and extend pupils’ learning.

As they move through school pupils have more frequent opportunities to develop their skills in, and take responsibility for, independently planning investigative work, selecting relevant resources, making decisions about sources of information, carrying out activities safely and deciding on the best form of communicating their findings.

As part of our teaching and learning process at Addingham we use ‘Science Super Heroes’ in our lesson planning. This ensures that a breadth of science teaching activities takes place in all year groups.

The super heroes are:

**Super Girl- comparative and fair tests**

**Billy Bookhead- Reseach using secondary resources**

**Spy Magnus- Observing over time**

**Commander Classify- Identifying, classifiying and grouping**

**Captain Peeko- Pattern seeking**

### **The Learning Environment**

Classrooms have displays of the current science learning. This is usually in the form of a working wall. The profile of science should reflect its place as a core subject. Resources for the unit of work being covered should be appropriately accessible. Other sources of information should be available.

Teachers at both key stages should maintain a science interest display, which encourages the pupils to be curious about the world in which they live. At Key Stage 1 this might involve something to look at carefully using a hand lens. At Key Stage 2 this might involve a recent newspaper article about a scientific discovery, which builds on, or contradicts, the work of a famous scientist in history.

All classrooms should display prominently the relevant scientific vocabulary being introduced in current units of work.

Alongside this there is a whole school display of science which is regularly updated to reflect the current science learning within school.

### **Making Cross Curricular Links**

At Addingham Primary School we believe that making links between curriculum subjects and matters, skills and processes will deepen the children's understanding by providing opportunities to reinforce and enhance learning. More frequently some of our formative assessment will be taken from cross curricular work where children are applying taught matters, skills and processes.

### **Inclusion**

Planning at all levels ensures that the interests of boys and girls are taken into account. At Key Stage 1 the pupils are grouped in mixed ability and gender groups for all activities. In Key Stage 2 pupils may be grouped by ability. The pupils work individually, in pairs, as part of a small group and as a whole class each term. They use a variety of means for communicating and recording their work. All pupils, including those with special educational needs, undertake the full range of activities. Teacher assessment determines the depth to which individuals and groups go during each unit of work.

### **Planning**

Science is taught for up to 2 hours a week. At least one hour of this time must be 'Working scientifically'.

### **Activating Prior Knowledge**

Using prior assessment information to guide activities and strategies this enables teachers to accurately identify the start point for learning. A record of the activity or strategy outcome is kept in each child's workbook. Prior assessment of children's knowledge is then used to focus the learning journey or unit for that topic.

### **Differentiation**

There are a number of different forms of differentiation:

- By outcome – where a task is given and the children respond at different levels
- Different tasks around the same topic matched to the needs of the children
- Variety of input for the same task
- Variety of questioning
- Depth of understanding

### **Contribution of Science to other areas of the curriculum**

The teaching of English, maths and ICT is promoted strongly in science as part of this school's drive to raise standards in English and Mathematics. Science is used to extend and enable the pupils to practise the skills of language and English and maths.

#### **English**

In particular, at Key Stage 1 the pupils are encouraged to use their speaking and listening skills to describe what they see and explain what they are going to do next. At Key Stage 2 the pupils are encouraged to develop their skills of writing to record their planning, they should be applying their literacy skills at levels similar to those which they are using in English work. Appropriate vocabulary (and the correct use of this vocabulary) should be encouraged both orally and when recording.

#### **Maths**

At both key stages the pupils are expected to use their knowledge and understanding of measurement and data handling at appropriate levels. In science, they should be applying their Numeracy skills at levels similar to those which they are using in their mathematics lessons, particularly when interpreting data. In this respect the two subjects are very closely linked- pupils need to be able to interpret data effectively in order to form valid conclusions for their science investigative work.

#### **Information and Communications Technology**

The pupils' ICT skills are applied at both key stages by the pupils using ICT to ;locate and research information (internet); record findings (using text, data and tables); log changes to the environment over time (sensing equipment); gain confidence in using calculators, video cameras, digital cameras, and microphones as well as the computer.

### **Personal, Social and Health Education and SMSC**

Health education is taught as part of the units on ourselves, health and growing, teeth and eating, moving and growing, keeping healthy and life cycles.

### **Assessment, Recording and Reporting in Science**

#### **Types of Assessment**

**Formative** – assessment for learning – allows the teacher to see what the child knows, understands and can do

**Summative** – assessment of learning – records overall achievement of the child gainst the end of year expectations

**Diagnostic** – identifies areas of strength and weakness

**Evaluative** – allows teachers and school leaders to see the effectiveness of teaching in terms of performance

#### **Formative Assessment**

Formative assessment is embedded in the teaching and learning process of Science at Addingham Primary School.

It involves:

1. Evaluating pupils level of knowledge
2. Setting explicit learning intentions
3. Sharing learning intentions and success criteria with pupils
4. Questioning effectively
5. Pupils evaluating their own and peers performance against success criteria
6. Teachers and pupils reflecting and reviewing performance and progress
7. Effective feedback, both oral and written, to inform pupils what they should do next
8. Children responding to feedback

#### **Self-Assessment and Peer Assessment**

Peer and self-assessment are ways of engaging children in understanding their progress in learning and identifying next steps in their learning that can be used in addition, and to support, to oral and written feedback from teachers and Support Staff. The aim is to involve children in the analysis and constructive criticism of their own and others work.

Learners use the success criteria to make judgements on their own, and peers, learning and identify areas for development – next steps.

#### **Day to Day Assessment**

Formative assessment within the lesson takes place all the time. Teachers use their pre assessments and marking to ensure all children have starting points which will allow them to make expected or more than expected progress each lesson. Teachers make these assessments during the lesson and after marking therefore allowing the assessments to inform future planning.

This may be achieved through:

- Questioning

- Observing
- Discussing
- Analysing
- Checking children's understanding through practical activities
- Engaging children in reviewing progress

### **Summative Assessments**

At the end of a unit of work summative assessments are made about each child's achievements. These can be formed from a teachers' observations during the unit and also from a 'test score' from a more formal assessment. Currently Addingham uses a mixture of 'mini-SATS' style assessments and also assessments which the class teacher may have created.

We record our summative assessments onto O Track (school tracking system) as either red-no understanding, yellow- working towards understanding, green- understood and purple- understood and embedded. Both knowledge and scientific enquiry are recorded.

### **Marking and Feedback**

#### **Rationale**

We are committed to providing relevant and timely feedback to pupils, both orally and in writing. Marking intends to serve the purposes of valuing pupils' learning, helping to diagnose areas for development or next steps, and evaluating how well the learning task has been understood. Marking should be a process of creating a dialogue with the learner, through which feedback can be exchanged and questions asked; the learner is actively involved in the process. (See Marking and Feedback Policy) At Addingham Primary School, we aim to provide consistency and continuity in marking throughout the school so that children have a clear understanding of teacher expectations. All lessons **must** start with an opportunity for children to respond to marking and feedback from the previous lesson.

#### **Moderation**

The moderation of the teaching and learning of Science at Addingham Primary School will occur termly alongside moderation of work.

Subject Manager monitors:

- Long term, medium term and short term planning although planning is used for by the teacher and for the children and may vary from teacher to teacher.
- Annual assessments when a summative judgement is made.
- Co-ordinates and monitors moderation of judgements
- Ensures policy is implemented
- Supports and guides teachers in teaching and learning of Science.
- Monitors and evaluates practices in school
- Keeps up to date with latest initiatives, research and resources and communicate these to staff
- Attends relevant CPD

- Prepares, organises and delivers appropriate CPD

All staff:

- Plan accordingly to ensure that all objectives for their year group are covered and that all children make at least expected progress over the year.
- Assess pupils work in each lesson and ensure this informs future teaching and learning
- Plan learning that is in response to assessment information and that where possible is child initiated
- Keeps a log of childrens progress including updating O Track at least termly
- Makes a summative judgement at the end of the year and a formal assessment in lines with national expectations in Years 2 and 6

### **Monitoring and Review**

The implementation of this policy will be monitored by the subject leader and the SLT. Monitoring and the review of this policy will take every two years.

### **Governor Involvement**

The named Governor for Science will meet with Mrs Jeffreys at key points during the year to monitor the effectiveness of the policy.

This policy has been approved and adopted by the Governing Body June 2017.  
Next review June 2019.