



## Science Procedures

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### Aims:

Science is all around us every day, wherever we are! At Frome Vale Academy it is our intention that children will see themselves as scientists. The school environment reflects the important we place on Science and the status the subject has in our school.

Children will understand that curiosity, wonder, logical thinking and systematic enquiry are all part of being a scientist. Through our science curriculum, our children will develop an understanding of the natural and physical world based on their observations and these will be confirmed or challenged through practical enquiry, research and discussion.

At Frome Vale Academy we recognise that Science is a rapidly changing and evolving subject, which affects everyone in different ways. We aim for our children to understand that current scientific knowledge and understanding is based on evidence and so has been amended as new evidence has been discovered. We aim to prepare our children for the wider world by giving them the skills to acquire new information that may challenge existing hypotheses through questioning, data collection, classification and analysis and practical investigations.

We believe that Science develops children's ideas and provides experience of ways of working that enable them to make sense of the world in which they live through scientific enquiry, as well as using and applying skills. Our children need to be able to build up a good scientific knowledge and understanding of the core concepts of Science.

Our aim is to develop a broader curriculum that gives children the opportunity to acquire in-depth knowledge in physics, biology and chemistry that teaches them to explain how and why things happen, an ability to investigate using the most effective scientific method and be able to communicate scientifically, both orally and in writing.

We aim to develop in our children an enthusiasm, curiosity, excitement and positivity towards Science. At Frome Vale, children are taught scientific knowledge and enquiry skills through a range of inquiries, hands on experiences, observations and research..

By the end of Year 6 we want all our children to be able to:

- Have an awareness of the scientific and technological world today and be equipped to deal with it in the future;
- Express their knowledge and understanding with confidence in a way appropriate to the situation;
- Have acquired a growing understanding of the nature, processes and methods of scientific enquiry;
- Have developed and be prepared to extend their understanding of the core concepts of chemistry, physics, biology and earth and space science;
- Use their natural curiosity and developing knowledge of scientific approaches to tackle problems and answer questions;
- Be open-minded and use self-assessment, resilience, perseverance and their developing skills of investigation – including: observing, measuring, predicting, hypothesising, experimenting, communicating, interpreting, explaining and evaluating;
- Use scientific language, recording and techniques;
- Make links between science and other subjects;
- Know how to work safely in the context of science.
- See themselves as scientists and understand the skills that this entails.

## **Planning**

The **I Am A Scientist** curriculum incorporates the aims and foci of The National Curriculum for Science and is this followed across Frome Vale Academy to ensure continuity and progression of scientific knowledge and skills.

Our curriculum sets out discrete year group programmes of study with ‘topics’ building upon previous learning to ensure secure and progressive understanding of the core concepts of Science as well as ‘working scientifically’.

Each year group follows the Whole School LTP, which places units in different terms depending on their curricular links, the length of them term and objectives or the challenge of the concepts. Planning is organised in two stages - long term and short term. Each ‘unit’ of Science being planned will include opportunities for children to review and extend upon their knowledge in that area as well as apply and develop their skills for working scientifically. Each unit will have opportunities for children to ask their own questions and follow their own lines of enquiry as well as develop their independence in selecting appropriate methods to answer those questions.

### **Long Term Planning**

The Science Subject Lead maps out the focus topics for the whole school for the year to ensure progressive coverage of the objectives outlined in the I Am A Scientist document. Each topic will have the investigation of the core concept for that area at the heart of planning to support children’s understanding of the big questions in Science. Each unit will begin with an elicitation activity/task to assess current knowledge and understanding in that area and will end with an assessment piece to show what each child has learnt and understood. Teaching and learning will be evidenced through the use of whole class working walls and individual progress and attainment will be evidenced in I am a Scientist books, which will move with the children as they journey from KS1 to KS2. Each unit will finish with a knowledge assessment, a ‘low floor, high ceiling’ task in which children can share their knowledge.

### **Short term Planning**

All year group teachers plan for Science on a short-term basis overview and for each lesson on an agreed Lesson Design. These topic overview plans show clear objectives and a progression of teaching ideas both for obtaining knowledge and for working scientifically.

Each overview will have the core concept for that topic in mind with learning opportunities planned to help children develop their understanding of that core concept. We aim for our children to understand how to effectively plan scientific enquiries to answer particular questions and so, ample opportunity will be provided for children to complete practical investigations in each topic.

Each teacher will also plan a full investigation (plan, do, review) for each topic. This doesn’t have to be a ‘fair’ test but should follow the enquiry types on the Lesson Design template. The level of independence in conducting scientific enquiry will be progressive across the school with enquiry supported and usually whole class/group work in LKS1 and increasingly child led as children progress through the school.

Teachers should, where possible, teach science at least once weekly for the duration on a term, as opposed to blocking it (though sometimes this may be necessary due to a short term or other mitigating circumstances).

Each lesson should be recorded on a class working wall, during and after the lesson. Evidence in class working walls (see example below) will take a variety of forms including written work, photographs, annotations, diagrams etc. At the end of each lesson, a photograph on the working wall should be taken and added to the next Lesson Design for children to review. Each child will have an elicitation piece, a mid-topic Working Scientifically piece and a knowledge assessment piece of work in their Science progress book for each topic, as well as a photograph of the completed Working Wall.



## **Early Years Foundation Stage**

At Frome Vale Academy our Science curriculum is taught through the areas of learning identified in the Early Learning Goals. The Early Learning Goals provide the basis for planning adult led activities which is balanced with child-initiated activities. The planning is based upon termly enquiry questions but planning responds to the learning needs and follows the interest of the children. Children are encouraged to explore using their senses, take part in practical activities and observe things closely as well as testing ideas and making predictions, all of which is done through mainly play based activities.

## **Quality First Teaching**

At Frome Vale Academy we strive to deliver Quality First Teaching by:

- Teachers and children having a clear understanding of the learning objective being taught;
- Teachers have opportunities to co-plan lessons with the Science Subject Lead, or other specialists within the trust.
- Planning lessons that are paced appropriately, are stimulating and suitably challenging and which drive learning forward;
- Modelling high expectations and providing learning opportunities for our children to succeed in meeting these expectations;
- Listening and responding to children in a sensitive and supportive manner;
- Being aware of the barriers to learning and planning to overcome these;
- Involving children in setting success criteria and giving opportunities for assessing their own work, including peer assessment;
- Informing children of their next steps of learning;
- Planning links to other curriculum areas and current events where appropriate, such as maths and writing;

- Using a variety of teaching and learning styles eg – research, investigation, exploration, collaborative or individual learning;
- Providing a stimulating environment to aid effective learning in science (including outside the classroom);
- Providing a safe environment in which to explore science;
- Giving children lots of often practical opportunities to apply and extend their investigative skills;
- Providing necessary and stimulating resources for learning to be effective.

## **Assessment**

- It is best practice for assessment for learning to be used to inform teaching during and at the end of each science lesson.
- Teachers will review the working wall at the end of each session to inform the pitch and focus for their next science lesson.
- Elicitation activities will be completed at the beginning of each topic and these will be recorded in the child's progress book. Two further pieces of work will be included for each child, per topic. One focused on scientific skills and one focused on key knowledge and vocabulary. These will allow us to track an individual child's progress as they move throughout the school.
- The working wall and work in progress books will be used to inform teacher assessment in Terms 2, 4, 6. These results will be recorded in the year group assessment grids.
- After each topic met or at the end of each term the same spreadsheet with the objectives and working scientifically will be completed.

In the foundation stage, science is assessed through observations of the children. These make up a larger picture of their learning which are then linked to the early years outcomes and early learning goals to know which objectives children are covering.

## **Feedback**

In science, the purpose of marking/review is to inform teaching and learning to ensure effective pitch, which will improve the development of skills and knowledge as children move through the school. There is no expectation for marking to be recorded for progress books but these should be referred to throughout a topic or throughout the year so that teachers' can gain an accurate picture of where each child is working.

## **Monitoring**

The Subject Leader should be responsible for improving the standards of teaching and learning in Science through monitoring and evaluating Science:

- Taking the lead in development designed to ensure progression and continuity of Science throughout the school;
- Providing support for colleagues in their development of planning and implementation of learning;
- Providing support in assessment;
- Assisting the SLT in the monitoring of progress and standards in Science;
- Taking responsibility for the potential purchase and organisation of central resources for Science;
- Keeping up to date with developments in Science education, disseminating information to colleagues as appropriate;
- Alongside the SLT, analysing any relevant data and monitoring teaching and learning. Using this information the subject leader will identify priorities and set appropriate targets. They should plan and develop resources accordingly to meet these targets.

### **Parental involvement**

We aim to involve parents directly in the life of the school, and thus in the development of children's skills, knowledge and understanding in Science. Parents are encouraged to come into school to view their child's learning or discuss their child's progress with their teacher. Termly year group newsletters provide information about the Science learning which will be undertaken. Learning, progress and attainment in science will be included on end of year reports for each child, which will be sent home to parents.

### **Equal opportunities**

All children are provided with equal access to the Science curriculum. We aim to provide suitable learning opportunities regardless of gender, ethnicity or home background.

### **Review**

It is the responsibility of those working in Frome Vale Academy to follow the principles stated in this procedure. The Principal and Subject Lead will carry out monitoring on Literacy as part of the whole school monitoring schedule.

