

# Bonneygrove Primary School Curriculum Guidance



## SCIENCE

## **INTENT**

At Bonneygrove Primary School, we wish to prepare our children for life in an increasingly scientific and technological world. By providing a creative, broad and balanced learning experience based on the objectives of the National Curriculum, we aim to give all children the opportunity to explore, question and understand the world in which they live. Through a learning environment which encourages curiosity, perseverance, open-mindedness, critical thinking and collaboration, we strive to develop their knowledge and understanding of important scientific ideas, processes and skills through the specific disciplines of biology, chemistry and physics.

We are gifted with an amazing outdoor environment and this is integral to our curriculum so that pupils are active, thus promoting the physical development and progressing their responsibility for their own health and wellbeing.

The curriculum at Bonneygrove Primary School equips pupils with a positive attitude towards their learning though empowering them to have high aspirations and set challenging goals for themselves. Our curriculum fosters independence, creativity, resilience, curiosity, determination, collaboration and the ability to make connections to prior learning to ensuring firm foundations for the learning ahead.

Our teachers are proactive and reflective practitioners who have the highest expectations, who use summative and formative assessment for learning to evaluate start points and how best to challenge all learners within Science.

### **Pupil Voice**

**'In Science, we ask questions and we find out answers.'**

**Jonathan - Key Stage One**

**'In Science, we build, make and test different things.'**

**George - Key Stage Two**

## **IMPLEMENTATION**

Our Horizons curriculum offers challenging and differentiated ideas for our science topics. Experiments are woven into our curriculum to allow teachers the opportunity to model scientific skills in order to provide children a suitable challenge.

### **Checking for Understanding (AfL)**

At the start and end of each topic, children complete a KWL grid to show: What is already known (K), What would like to be known (W) and What has been learnt (L).

With children learning and applying scientific skills, it is vital to check children's understanding to ensure progress. Our use of the self-assessment jigsaw grids provides children with the opportunity to evaluate their own learning against the success criteria and allows teachers to address misconceptions whilst the lesson is fresh in children's minds.

### **Sticky Learning**

Our Horizon's curriculum ensures that all new learning is linked to previously learned concepts. This helps to embed new knowledge and ensures new learning is cumulative and built on firm foundations. The curriculum also encourages frequent revisiting, reviewing and consolidation of information throughout the unit and subsequent units as well as building on prior learning year after year.

Teachers make sure learning is meaningful and purposeful to children's lives by making topics relatable to the world outside our window. We encourage children to stop and think about why things are the way they are. Why are things cold? What is the coldest temperature ever recorded?

In Science lessons, children are taught strategies to help them to remember, for example, classifying and grouping information as well as verbal rehearsal. Learning is presented in a variety of ways with the use of visual aids, modelling, active learning, discussion, role play and use of concrete resources.

### **Oracy**

Science is a core subject that relies heavily on students' ability to understand new terms and concepts. Children are encouraged to 'talk like scientists' - discussing their ideas and explaining their thinking which aids with understanding and embeds learning.

A strong focus on vocabulary helps children understand and communicate using appropriate terminology, and the incorporation of visual aids makes learning stick. Teachers expose children to new terminology at the start of a topic and continually refer to vocabulary throughout the unit. Working walls display vocabulary cards with pictures to support meaning; speaking frames are used to support children with articulating their ideas and Kahoot quizzes are used to reinforce vocabulary and concepts as well as to assess learning.

### **Learning powers**

Our use of self-assessment tools promotes independence and encourage a growth mindset within Science. By encouraging children to reflect, it allows them to take responsibility for their learning. Self-assessment lets our students consider their decisions, reflect on actions, and consider/plan future processes. We encourage children to explore their own ideas, which will naturally lead to new discoveries. Children are taught to see 'mistakes' as learning opportunities which fosters qualities like resilience and perseverance. We encourage a supportive science classroom where everyone is responsible for helping each other learn, for example, through partner talk and peer support.

### **How do we plan for cultural capital?**

At Bonneygrove Primary School cultural capital is planned to ensure children are given every opportunity to experience success and the best possible start to their early education. Here at Bonneygrove Primary School cultural capital is seen as the accumulation of knowledge attitudes, habits, language and possession that enables individuals to demonstrate their cultural competence and social status. Our school immerses children in art, dance, theatre, galleries, historic sites and introducing them to science, literature and art.

In order to ensure that we close gaps at Bonneygrove Primary School between different socio-economic backgrounds, we ensure each has the same opportunity to reach their full potential

### **Embedding curriculum**

#### **Cross Curricular links**

Children are expected to use their English skills; reading, writing and speaking and listening during science lessons. Children apply their mathematical knowledge to their understanding of science, through working on investigations where they learn to estimate and predict, collect, compare and record data as well as analyse results and draw conclusions. Science also makes a contribution to the teaching of PSHE. For example, teaching the children about keeping healthy and staying safe, along with teaching them collaborative skills.

### **SEN**

At Bonneygrove Primary School we are proud of the provisions we have in place to help support our children with additional needs. Science is a topic that contains numerous experiments and opportunities to interact with the senses in ways that other topics cannot. However, as some children can experience sensory overload we are mindful to ensure all of our children are able to share the same experience. We have taken a holistic approach to providing for our SEN pupils and each teacher caters for the individual needs of each child.

### **Golden Threads**

Our six Golden Threads are embedded throughout the science curriculum, providing cross curricular engagement throughout each year group.

## **Outdoor Learning**

Every year group is given the opportunity to engage with outdoor learning for example, observing plants, studying consumers and producers in our woods and creating wildlife documentaries.

## **Philosophy for Children**

Science topics allow for big questions to be posed to the children which develops their critical thinking. For example: Should animals be taken from their natural habitat? Why are chimpanzees endangered?

## **Mindfulness**

Mindfulness means paying full attention to something. It means slowing down to really notice what you're doing. Being mindful is the opposite of rushing or multitasking. We encourage children to be mindful when setting up experiments and to conduct research so that they can focus on their projects.

## **Growth Mindset**

We believe that a growth mindset can be fostered in any child. Our Science curriculum introduces famous scientists who have had to overcome huge challenges in their lives, for example , Stephen Hawking.

## **Ethics**

By the time children leave Bonneygrove Primary School, we want them to be blossoming into responsible citizens with the real potential of making the world a better place. In Science, children study important current world topics, for example, recycling, deforestation and its impact.

## **Sportsmanship**

Science teaches children the concept of 'Fair Play' through fair tests in investigations.

## **IMPACT**

Children begin their science journey in the Early Years Foundation Stage where they start to make sense of their physical world through exploring, observing and finding out about technology and the environment. Children learn about similarities and differences in relation to places, objects, materials and living things. They are given opportunities to 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 they talk about changes.

This journey of Science exploration at Bonneygrove Primary School culminates in Year six, where we aim for all children to have the foundations and knowledge for understanding the world.

By the end of Year six, we want the children to have developed a deeper understanding of a wide range of scientific ideas and begin to recognise how these ideas help them to understand and predict how the world operates. Children will also have begun to recognise that scientific ideas change and develop over time.

Throughout their time at Bonneygrove Primary School, the children will be able to 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. Children should be able to 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. Children will be able to work collaboratively and practically to investigate and experiment.

We want the children to be able to explore and talk about their ideas; ask their own questions about scientific phenomena, reflecting on prior taught knowledge and explain processes they have taken and be able to reason scientifically.

## Science Policy

Children should also be able to read, spell and pronounce scientific vocabulary correctly and spelling of key vocabulary is introduced in each topic and monitored closely to ensure its engagement and understanding.

## Role of the subject Leader

Science will be led by the whole staff and will be a focus for several staff meeting. Standards of teaching and learning will be adjudged using work sampling and data review. The policy will be reviewed at this meeting.

## Objectives

The following objectives derived from above aims will form the basis of our decisions when planning a scheme of work. Assessment will also be related to these objectives:

- to develop pupils' enjoyment and interest in science and an appreciation of its contribution to all aspects of everyday life
- to develop a knowledge and appreciation of the contribution made by famous scientists to our knowledge of the world including scientists from different cultures
- to encourage pupils to relate their scientific studies to applications and effects within the real world
- to develop a knowledge of the science contained within the programmes of study of the National Curriculum.

To build on pupils' curiosity and sense of awe of the natural world

- to develop in pupils a general sense of enquiry which encourages them to question and make suggestions
- to encourage pupils to predict the likely outcome of their investigations and practical activities

To use a planned range of investigations and practical activities to give pupils a greater understanding of the concepts and knowledge of science

- to provide pupils with a range of specific investigations and practical work which gives them a worth-while experience to develop their understanding of science
- to develop progressively pupils' ability to plan, carry out and evaluate simple scientific investigations and to appreciate the meaning of a 'fair test'.

To develop the ability to record results in an appropriate manner including the use of diagrams, graphs, tables and charts

- to introduce pupils to the language and vocabulary of science
- to give pupils regular opportunities to use the scientific terms necessary to communicate ideas about science
- to develop pupils' basic practical skills and their ability to make accurate and appropriate measurements
- within practical activities give pupils opportunities to use a range of simple scientific measuring instruments such as thermometers and force meters and develop their skill in being able to read them.

To develop pupils' use of ICT in their science studies

- to give pupils opportunities to use ICT (video, digital camera, data logger) to record their work and to store results for future retrieval throughout their science studies
- to give pupils the chance to obtain information using the internet.

Principles of teaching and learning

## Differentiation and Additional Educational Needs

The study of science will be planned to give pupils a suitable range of differentiated activities appropriate to their age and abilities. Tasks will be set which challenge all pupils, including the more able. For pupils with SEN the task will be adjusted or pupils may be given extra support. The grouping of pupils for practical activities will take account of their strengths and weaknesses and ensure that all take an active part in the task and gain in confidence.

Breadth and Balance  
Variety.

Pupils will be involved in a variety of structured activities and in more open-ended investigative work:

- activities to develop good observational skills
- practical activities using measuring instruments which develop pupils' ability to read scales accurately
- structured activities to develop understanding of a scientific concept
- open ended investigations.

On some occasions pupils will carry out the whole investigative process themselves or in small groups.

### **Cultural Capital**

Wherever possible science work will be related to the real world and everyday examples will be used.

### **Cross-curricular skills and links**

Science pervades every aspect of our lives and we will relate it to all areas of the curriculum. We will also ensure that pupils realise the positive contribution of both men and women to science and the contribution from those of other cultures. We will not only emphasise the positive effects of science on the world but also include problems, which some human activities can produce.

### **Continuity and Progression**

Foundation Stage pupils investigate science as part of Understanding of the World. Children are encouraged to investigate through practical experience; teachers guide the children and plan opportunities that allow the children to experience and learn whilst experimenting for themselves. By careful planning, pupils' scientific skills and knowledge gained at Key Stage 1 will be consolidated and developed during Key Stage 2.

At Bonneygrove Primary School we have developed a standardised investigation framework that children are introduced to in KS1 and become increasingly familiar with throughout KS2.

Pupils in Key Stage 1 will be introduced to science through focused observations and explorations of the world around them. These will be further developed through supportive investigations into more independent work at Key Stage 2. The knowledge and content prescribed in the National Curriculum will be introduced throughout both key stages in a progressive and coherent way.

### **Equality of Opportunity**

All children have equal access to the science curriculum and its associated practical activities. The SLT, Class Teachers and TAs at Bonneygrove Primary School are responsible for ensuring that all children, irrespective of gender, learning ability, physical disability, ethnicity and social circumstances, have access to the whole curriculum and make the greatest possible progress. Where appropriate, work will be adapted to meet pupils' needs and, if appropriate, extra support given. More able pupils will be given suitably challenging activities. Gender and cultural differences will be reflected positively in the teaching materials used.

All children have equal access to the Science Curriculum, its teaching and learning, throughout any one year. This is monitored by analysing pupil performance throughout the school to ensure that there is no disparity between groups.

### **Health and safety**

Pupils will be taught to use scientific equipment safely when using it during practical activities. Class Teachers and Teaching Assistants will check equipment regularly and report any damage, taking defective equipment out of action. A simple risk assessment will be carried out for all practical activities any perceived hazards will be reported to the Head who will determine the appropriateness of said activity.

### **Assessment for Learning, recording and reporting**

Throughout the school, Teachers will assess whether children are working at/above or below the expected level for their age based on their understanding and application of the content of the National Curriculum 2014. Progress and attainment is reported to parents through parents' evenings and end of year reports.

### **Marking for Improvement (see policy)**

Much of the work done in science lessons is of a practical or oral nature and, as such, recording will take many varied forms thus making marking different. It is, however, important that written work is marked regularly and clearly, as an aid to progression and to celebrate achievement. When appropriate, pupils may be asked to self-assess or peer assess their own or other's work.

Marking for improvement comments in a child's book must be relevant to the learning objective to help children to better focus on future targets.

### **Resourcing**

Specialist pieces of equipment and those posing a potential safety risk will be held centrally and staff access when required.