



## **Beecroft Primary School Science Policy**

**September 2023**

### **1. The intent** of our science curriculum at Beecroft

Our school comprises of children from hard pressed families and a rich variety of cultural and ethnic backgrounds. For many of our children, science is an introduction to the world, learning to notice, question and describe the natural phenomena around them.

Many of our children start school with a narrow vocabulary. It is our intent that children are taught key scientific concepts through a language-rich curriculum where language and ideas are consolidated, revised and remembered and built upon year by year. Our intent is for children to develop a scientific level of enquiry by encouraging questioning and reason through the use first hand experiences, the use of technology and high quality resources such as non-fiction texts and articles.

Beecroft pupils also enter school with limited exposure to experiencing the world around them. It is therefore crucial for children at Beecroft to participate in a curriculum where scientific teaching and learning is relevant, real and relating to the pupils. Science education at Beecroft will provide children with inter-woven disciplinary knowledge that progresses and allows children to make sense and deepen understanding of taught concepts and substantive knowledge.

### **2. The implementation** of our science curriculum at Beecroft

Pupils at Beecroft need to be given the building blocks in order to allow them to succeed. Many pupils in our school have never experienced basic scientific concepts and ideas or have any notion of how science relates to them. It is therefore essential that science teaching takes the form of a **spiral curriculum**, where repetition and revisiting of the appropriate basic starting points (e.g. basic anatomy of plants is revisited before learning about seed dispersal and pollination) takes place at the beginning of learning units taught throughout the school. Science is taught in **discreet units**, as a subject within its own right.

We aim:

- For all children to learn and remember the appropriate skills and knowledge stated in the National Curriculum through implementing the '5 a day' teaching strategies.
- For all children to have a deep and consolidated understanding of scientific concepts through revision and reflection
- to help children to acquire transferrable understanding and skills through consistent and progressive inclusion of disciplinary knowledge and quality first teaching
- for children to include literacy skills to present their knowledge and skills
- to encourage co-operative and collaborative working
- to encourage open-mindedness, appreciation of others views and to value own thoughts in line with British Values.
- to enable children to experience success and be proud of their achievements
- that by the time they leave Beecroft children should be working to a high standard compared to those of National expectations

- to enable each individual to reach their full potential across a broad range of science activities through the quality first teaching.
- to foster the required scientific knowledge to understand science uses today and in the future.

## Quality of Teaching

Science through all three strands (chemistry, biology and physics) are taught in the classroom.

### Teaching Strategies

Beecroft is committed to ensuring children achieve through quality first teaching. One way we ensure all teaching and learning is of high quality is by following the 'five a day' strategies.

- **Metacognition.** Teachers are continually modelling and explicitly teaching children how to plan, monitor and evaluate their own learning, to identify where they may need support and to actively engage in their own learning process. This is through helping them to understand thinking and utilise strategies for learning, for example in Year 2 the use of the acronym MRGREN is used to help remember the processes of living. Teachers are clear about cognitive load and providing opportunities for pupils to consolidate information into their long-term memory.
- **Explicit instruction.** Teachers share knowledge using clear explanations, simple language and relatable examples when teaching as well as voicing internal thought processes aloud to model for pupils what application of knowledge and engagement in learning activities looks like. Pupils are shown how to put learning into practice within a task before independent practice and teachers carry out frequent check-ins with pupils to consolidate and check on understanding
- **Scaffolding.** Learning is chunked into digestible information and is supported by writing frames, diagrams and other tools to help children know and remember more.
- **Flexible Grouping.** Teachers form pupils at a similar level into a temporary group that splits away from the class to work on a specific area and form mixed-ability groups for certain tasks so pupils can support each other.
- **Use Of Technology.** Technology use, through the incorporation of quality video examples, classroom software such as powerpoint and smartboard and the use of clevershare on the ipads, it interwoven into lessons to

### Science Curriculum Planning

Science is taught weekly for two hours throughout school. The long term plans show coverage of scientific concepts as children move through the school, ensuring progression and continuity. Long term plans are updated each year in line with the planning of the class teacher and in collaboration with the science leader.

Key concepts are mapped out and these are continuously revised and relearnt to ensure that pupils know and remember more:

Disciplinary Knowledge	plants	Animals, Inc humans
pattern seeking- <i>question, think, analyse</i> research fair testing observation over time identifying and classifying	plants around us plants that benefit us life cycles reproduction environmental changes	senses healthy eating and exercise skeletons, <u>muscles</u> and circulation teeth and digestion human development
Everyday Materials	Living Things <u>And</u> Their Habitats	Physics
labelling properties and uses states of matter	classifying and sorting food chains environmental factors habitats	rocks and soils light forces electricity

Medium term plans show how the learning is sequenced and progressive, building upon the substantive and disciplinary knowledge mastered the year before. Disciplinary knowledge is sequenced into plans and follows our progression model. Teachers are supported to think of how disciplinary knowledge is planned in each unit and how it complements substantive knowledge.

Teachers are encouraged and supported to think of common misconceptions for each unit and for these to be included in their planning. This ensures that teachers are aware of any potential misunderstanding and aids in explicit teaching.

### **Foundation Stage**

Nursery and Reception children are involved in science activities which have an appropriate interest value and have the capacity to excite, provide enjoyment and engage in natural phenomena. Teachers engage the children and, through sustained shared thinking, develop pupils' understanding and communication of this. Role play and outdoor provision is seen as very important at this stage of pupils' learning. Foundation stage teachers ensure that key vocabulary is explored and that children are exposed to a rich variety of vocabulary with each unit.

- Each unit of work includes relevant data collection opportunities and the use of appropriate equipment to collect this data where appropriate (e.g. measurements of rainfall).
- Key concepts of *senses* are repeated in each unit of work.
- All units are planned and sequenced to link to their learning in Year 1.

### **Literacy**

Participating as a speaker and listener has a high profile in this school and is key in learning more and remembering more. Children are taught to express themselves clearly in speech and writing and to develop reading skills. High quality books and resources are used to allow children to use their reading skills when understanding and consolidating science learning. Pupils are taught to use grammatically correct sentences and to spell and punctuate accurately.

Core vocabulary is actively taught in each unit of work and is visible on displays and contained in pupils' books for each piece of work so that it can be learned and frequently discussed. Vocabulary is attached to every medium term plan. Pupils are pre-taught complex vocabulary before the unit begins.

Each science topic is to include a piece of extended writing that follows the principles of English writing at Key Stages 1 and 2 (including cumulative re-reading, etc. - see English Policy). The writing will follow a specific genre, for example - argument, investigation, explanation.

- Argument: Should we all have bug hotels in our gardens?
- Explanation: How is metamorphic rock formed?
- Investigation: How does exercise your heart rate?

Each child in Key Stage 1 and Key Stage 2 has a science drafting book and a science book where drafted writing is copied up in neat.

### **Computing In Science**

Pupils are given opportunities to develop and apply their computer skills in their study of science. This includes the use of the internet and school based materials. Handling of data is particularly important in science work. ICT enables children to handle a large amount of information and simplifies the representation and interpretation of results. Children should also be taught to carry out research by gathering information from school based materials and the Internet to select appropriate material. They should additionally use computer simulations and data - logging equipment where appropriate.

### **Mathematics**

Pupils use their mathematical capability in a practical way through their science work. Children often

have to measure and look for patterns and relationships in their results, using reasoning skills. When planning investigations teachers take account of children's ability, deciding, for example, whether to use non-standard or standard unit. Science is a particularly useful area for developing data handling skills. Teachers consider the mathematical skills needed when planning medium term plans and how these skills may need to be revised, for example, the need to get to eye level when measuring out liquids to ensure maximum accuracy and being able to read scales competently.

### **Equal Opportunities and Special Needs**

Every effort is made to ensure that science enquiries and investigations are equally interesting for both boys and girls. Early years teachers in particular use observational records to ensure that all pupils are encouraged to take part in science activities. The data on girls and boys performance in tests and teacher assessment are analysed as part of the monitoring process. Gender/culture biased books and resources are not used in our school. Teacher attitudes and expectations at Beecroft reflect our views on equal opportunity. Scientists from diverse ethnicities are included in research opportunities per unit for each class to encourage high standards or aspiration for all no matter of background.

Children with special educational needs can often particularly benefit from first hand experience in science activities. Children on the special needs register are involved in all science work planned from the medium term plans. Tasks may be of an open-ended type where the differentiation is by outcome. Teachers may use organisational methods such as flexible grouping or the use of a teaching assistant to help or extend pupils with different abilities.

### **Assessment, Recording and Monitoring**

Teachers will assess children's work by making informal judgements during lessons. Assessment should be process orientated - reviewing the way that techniques and skills are applied purposefully by pupils to demonstrate their understanding of scientific concepts. Pupil's work is marked following lessons and comments are related to the scientific knowledge, understanding and skills. Teachers always follow up basic skills in numeracy and literacy and comments on these should be evident and followed up. Teachers use their on-going assessment to identify areas of need and adjust their planning accordingly. *Assessment sheets are used to help monitor and assess pupil's knowledge and skills in science. They contribute towards giving an indicative level of performance and are passed on to the next class teacher to allow for adequate planning.*

Monitoring is carried out to raise standards and to indicate coverage of the subject. Science books are collected regularly. Comments are recorded and the science leader, class teacher and leadership team discuss these.

The headteacher and science leader analyse the results of KS1 and KS2 SATs results annually. The information from Beecroft is compared with local and National results. In school staff development follows from the findings of monitoring and analysis of results.

### **Resources**

Beecroft Primary School believes in using high quality literacy and technology resources to aid in children's understanding. Specific content-based resources to be used to support science are organised and stored in the science cupboards in shared areas. Resources to aid in working scientifically are stored in the old library. Teachers borrow resources on a regular basis for lessons and must ensure that they are returned, well organised, and in a fit state for future use. New resources needed and items needing repair or replacement should be reported to the science leader immediately. These are audited each year to check for working use and expiration.

Children are trained in the safe and considerate handling of animals, plants and equipment, and taught not to be careless with consumables and materials.

### **Parental and Community Involvement**

Teachers may invite parents to support children's understanding of science by:

- sending out letters informing them, and requesting help with, the term's work
- inviting parents into the classroom to work alongside pupils on tasks
- helping to supervise children on visits
- using parents as visiting experts on a topic (e.g. gardening, babies)
- giving homework

Teachers make use of our local environment and links with the community where appropriate.

### **Safety and Care**

The safe use of equipment is promoted at all times.

Individual science risk assessments are reviewed each year by the science leader and are available in the working scientifically resources cupboard. Any animals, including insects, being used for study are treated with respect and returned to their natural habitat as soon as the activity is complete. Leaves and berries of a poisonous nature are avoided in classroom displays and their dangers made clear to children. Risk assessments are carried out for all off-site visits.

### **Review**

This policy is reviewed by the staff and governors annually. Parents are most welcome to request this document and comments are invited from anyone involved in the life of the school.

**Review date: September 2024**

**S Carter**