

**Beecroft Primary School Maths Policy**  
**September 2023 (see Calculation And Arithmetic Policy)**

**INTRODUCTION**

This document is a statement of the aims, principles and strategies for the teaching and learning of mathematics at Beecroft Primary School. Mathematics is a core subject and this policy has been written in accordance with its statutory requirements.

All pupils can achieve in mathematics. At Beecroft Primary School, it is our belief that pupils are not learning to be mathematicians but that they are mathematicians.

‘Mathematics is a creative and highly inter-connected discipline...a high-quality mathematics education should provide a foundation for understanding the world, the ability to reason mathematically, an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity.’ (National Curriculum for Mathematics, 2014)

**INTENT, IMPLEMENTATION, IMPACT**

We aim to equip pupils with the tools to understand maths. These tools include reasoning, problem solving and the ability to think in abstract ways. Mathematics is integral to all aspects of life; with this in mind, we strive to ensure that our children develop an enthusiastic attitude towards mathematics that will stay with them and support them in the next stage of their education and beyond. At each stage of learning, children are actively supported to reach their full potential as mathematicians.

**Intent – What are we trying to achieve?**

- To deliver an inspiring and engaging mathematics curriculum, taught by highly enthusiastic staff, which sparks curiosity and excitement and which nurtures confidence in maths lessons.
- To teach the skills needed to succeed in mathematics, providing examples of good practice and have high expectations of all pupils.
- All pupils are expected to succeed and make progress from their starting points.
- Pupils become confident, competent and independent mathematicians.
- Pupils develop a deep conceptual understanding of maths and its interrelated content so that they can apply their learning in different situations.
- Pupils can confidently articulate, discuss and explain their thinking using

appropriate mathematical vocabulary.

### **Implementation – How is our vision translated into practice?**

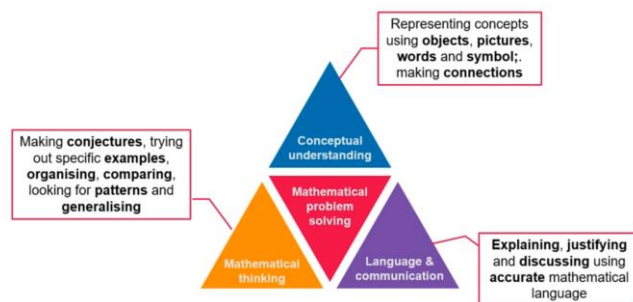
Our implementation is developed through secure understanding of the curriculum and subject area.

Our long-term planning follows the National Curriculum 2014. All teachers follow a termly overview plan and design lessons using a range of resources, following the learning sequence of the White Rose Maths Scheme of Learning from the White Rose Maths Hub.

We recognise the value of making a coherent journey through the national curriculum and each year group follow a medium-term plan where small, cumulative steps build a solid foundation of deep mathematical understanding. A structured six week termly overview provides opportunity for pupils to develop their understanding of mental maths and methods of mental calculation, formal written methods, problem solving and reasoning skills.

A typical maths lesson provides the opportunity for all children, regardless of their ability, to become confident and capable learners. We are committed to building on prior learning and enabling our children to demonstrate a deep, conceptual understanding of each topic that they can develop over time. They are encouraged to develop fluency in their recall of key facts and a whole school approach to the teaching of calculation strategies is deployed across the school. This ensures a consistent and progressive approach and prepares our children for the upper key stage 2 curriculum. Reasoning and problem-solving skills are explicitly taught to enable children to become independent learners. To make the learning relevant, cross-curricular links are made wherever possible and children are encouraged to apply skills from all areas to complete real-life challenges and give learning a sense of purpose.

Teaching maths for mastery involves whole-class interactive teaching and is underpinned by the dimensions of depth, which together enable pupils to develop deep understanding of the subject.



The three principles of the dimensions of depth in evidence at Beecroft are:

### *Concept 1: Conceptual Understanding*

At Beecroft Primary we use a Concrete-Pictorial-Abstract (CPA) approach to teaching mathematical concepts.

**Concrete** - the doing: A pupil is introduced to an idea or a skill by acting it out with real objects. This is a 'hands on' component using real objects and it is the foundation for conceptual understanding. 'Concrete' refers to objects such as dienes apparatus, fraction tiles, counters, or other objects that can be physically manipulated.

**Pictorial** - the seeing: A pupil may also begin to relate their understanding to pictorial representations, such as a diagram or picture of the problem.

**Abstract** - the symbolic: A pupil is now capable of representing problems by using mathematical notation, for example:  $12 \div 2 = 6$ . This is the most formal and efficient stage of mathematical understanding.



### *Concept 2: Language and Communication*

At Beecroft we believe that mathematical language strengthens conceptual understanding by enabling pupils to explain and reason.

The way pupils speak and write about mathematics has been shown to have an impact

on their success in mathematics (Morgan, 1995; Gergen, 1995). We therefore use a carefully sequenced, structured approach to introducing and reinforcing mathematical vocabulary throughout maths lessons, so pupils have the opportunity to work with word problems from the beginning of their learning.

Every maths lesson provides opportunities for pupils to communicate and develop mathematical language through:

- Sharing the key vocabulary at the beginning of every lesson and insisting on its use throughout.
- Modelling clear sentence structures and expecting pupils to respond using a full sentence.
- Discussion activities, allowing pupils to discuss their thinking and reasoning of the concepts being presented.
- Plenaries (short activity during or at the end of the lesson) which give a further opportunity to assess understanding through pupil explanations.

### *Concept 3: Mathematical Thinking*

Pupils are given the opportunity to deepen their understanding by asking and exploring questions, by giving examples, by sorting and comparing or by looking for patterns and rules in the mathematics they are exploring. Longer reasoning sessions are planned into the six-week overview planning format.

### **Impact – What is the impact of our curriculum?**

#### *Evidence In Knowledge*

- Mathematical concepts or skills are mastered when a child can show it in multiple ways, using mathematical language to explain their ideas, and can independently apply the concept to new problems in unfamiliar situations.
- Children are engaged and challenged to their full potential.
- Children demonstrate a quick recall of facts and procedures. This includes the recall of the times tables.

#### *Evidence In Skills*

- Pupils use precise vocabulary during maths lessons.
- They have the skills to use methods independently and show resilience when tackling problems. They have the flexibility and fluidity to move between

different contexts and representations of maths.

- Children show a high level of pride in the presentation and understanding of the work.
- They have the chance to develop the ability to recognise relationships and make connections in maths lessons.
- Children apply mathematical skills across different areas of the curriculum.

#### *Pupil Voice*

- Through discussion and feedback, children talk articulately using mathematical language and vocabulary about their maths lessons and speak with enthusiasm about their love of learning in maths.
- They can talk about the context in which maths is being taught and relate this to real life purposes.
- Children show confidence and believe they can learn about a new mathematical concept and apply the knowledge and skills they already have.

#### *Outcomes*

At the end of each year, we expect the children to have achieved Age Related Expectations (ARE) for their year group. Some children will have progressed further and achieved greater depth (GDS). Children who have gaps in their knowledge receive appropriate support and additional help.

### **ORGANISATION FOR THE TEACHING OF MATHEMATICS**

- The mathematics curriculum is organised as a discrete subject, although pupils will apply their learning to different areas of the curriculum.
- The daily mathematics lesson is taught by the class teacher. This allows for additional flexible grouping time for additional practice of skills outside of the main lesson based on the teacher's ongoing assessment of their pupils.
- Mathematics is taught for approximately 6-7 hours per week across the school.
- The pupils have timetabled arithmetic and maths reasoning lessons.
- The teaching structure of the maths lessons is based on the three-part lesson (mental/oral starter, main teaching activity and plenary). A typical lesson in Year 1 to 6 is structured as follows:
  - Oral work and mental calculation (about 5 to 10 minutes). This will involve whole class work to rehearse, sharpen and develop mental and oral skills.

- The main teaching activity (about 30 to 40 minutes). This will include both teaching input and pupil activities and a balance between whole class, guided groups, paired and individual work.
- A plenary, about 5 – 10 minutes at the end of the lessons and, where appropriate, short ‘plenaries’ interspersed throughout the lesson. This will involve work with the whole class to sort out misconceptions, identify progress, to summarise key facts and ideas and what to remember, to make links to other work and to discuss next steps in children’s learning.
- The method of working in the main mathematics lesson is a combination of individual work, group work and whole class teaching. For the introduction of new concepts, the children will be taught as a whole class before in depth and differentiated work is continued in small groups, in pairs or as individuals as appropriate.
- Each week mathematics lessons include opportunities for:
  - demonstration, explanation and instruction by the teacher to groups, individuals and the whole class
  - whole class or group discussions encouraging the use of accurate and technical vocabulary.
  - pupils to ‘talk’ through their calculations and strategies for problem solving.
  - practical activities to provide a meaningful context to learning.
  - practical activities to consolidate skills which have been learnt and the use of mental mathematics involving quick recall of mathematical facts.
  - the learning, revision and rehearsal of key mathematical facts e.g., number bonds, measurement and shape facts
  - problem solving and investigative activities.
  - pupil explanation of methods to their peers and the class
- Teachers of the Reception children base their teaching on objectives in the Framework for Reception; this ensures that they are working towards the ‘Early Learning Goals for Mathematical Development’. Towards the end of Reception teachers aim to draw the elements of a daily mathematics lesson together so that by the time children move into Year 1 they are familiar with the 60-minute lesson.

### **STRATEGIES FOR THE TEACHING OF MATHS**

The mastery-learning model forms the basis for our approach to teaching maths. We ensure our children have a solid understanding of the subject knowledge and skills involved with their learning by taking small steps and spending time teaching each

mathematical concept to ensure every child has a secure and sustainable knowledge and understanding.

We recognise that for pupils to progress to deeper and more complex problems, children need to be confident and fluent across each yearly objectives. To ensure consistent coverage across the school, we use a range of agreed materials and resources to provide age-appropriate tasks for our pupils: in turn, practising key skills and allowing children to become confident when working on key strategies, calculations or methods.

Lessons are carefully planned to ensure that pupils can achieve and make progress towards their targets. Staff anticipate potential misconceptions and explicitly teach new skills and concepts in small steps focused on teacher demonstration followed by guided practice and independent practice. To aid understanding, clear and unambiguous language is used in lessons and essential content is highlighted and distracting information is removed.

The five key strategies we use at Beecroft identified as having strong evidence for their effectiveness in supporting pupils are:

1. Explicit instruction: Clear explanations, modelling and frequent checks for understanding. This is then followed by guided practice, before independent practice.
2. Cognitive and metacognitive strategies: Managing cognitive load is crucial if new learning is to be transferred into the long-term memory. This also includes opportunities for pupils to monitor and evaluate their own learning.
3. Scaffolding: The use of a supportive tool or resource can be an effective scaffold. We aim to gradually reduce the scaffold over the course of a week/s.
4. Flexible grouping: Allocate groups temporarily based on the current level of attainment. This could be a group that receives additional instruction based on current needs before joining the rest of the class or additional sessions in an afternoon.
5. Using technology: Technology can be used effectively by teachers to model worked examples, or by pupils to help them to learn.

To ensure our pupils acquire a deeper understanding in their mathematical learning journey, we supplement our resources by using the DfE Supporting Mathematics Guidance, White Rose Maths Hub and NCETM Teaching, Learning and Assessment materials to guide and support the teaching of mathematics. We also base our teaching strategies on guidance from the EEF 'Improving Mathematics' documents.

## **PLANNING**

### **Long Term Planning**

The planning of the curriculum is based on the learning objectives outlined in the national curriculum. This document emphasizes the importance of all pupils mastering the content taught each year and discourages the acceleration of pupils into content from subsequent years.

### **Medium Term Planning**

The programmes of study for each year group are broken down into termly medium-term plans. Model plans are provided for staff and repetition of key skills alongside introducing new skills is strongly emphasized. A half-termly structure for planning is provided to ensure coverage of mental and written skills in addition to there being adequate time for problem solving, reasoning and revision.

### **Short Term Planning**

A suggested structure for 'what a week will look like' is provided for staff.

Teachers hand their weekly maths planning in to the Headteacher; these plans are also looked at by the maths leader and discussed with teachers. Assistance with planning from the leadership team or other members of experienced staff is available and encouraged. Coaching sessions about planning are part of the induction programme for ECTs.

## **MATHS VOCABULARY AND KEY FACTS**

We believe that vocabulary and a thorough grasp of key mathematical facts is pivotal to pupils' understanding and progression in maths. Each year group has specific vocabulary targeted for their age group and this forms the basis of what is taught in every class. Every lesson starts with sharing vocabulary for the lesson/topic, and this is built upon as pupils progress through the school. Good use of vocabulary is modelled by all teachers and is used in mental starters and quality questioning to ensure that the pupils make the links between the different words, facts, their meaning and application. When pupils misuse vocabulary the appropriate use of the word is re-modelled for them. Equally pupils are corrected when vocabulary choices are not precise.

We believe that time needs to be spent teaching our pupils key facts and how to use specific maths vocabulary to explain their work and learning. This is modelled in all lessons and helps the pupils to feel in control of their learning and also how to explain



their own difficulties or misconceptions, therefore helping them to improve their understanding.

When tackling a word problem our school approach incorporates the following steps – RUCSAC.

- Teacher **reading** the question
- Pupils **reading** the question
- Addressing as a class any words which are not **understood** (especially important for words with more than one meaning and for EAL pupils)
- **Underlining** key vocabulary and discussion of this in context
- Paired talk discussing how they know which **calculation** to use to solve the problem
- Pupils are then expected to **solve** the problem and be able to explain their working out using appropriate vocabulary. This will have been modelled by the teacher and may include speech starters on the board.
- **Answer** the question ... does the solution of a division calculation produce a remainder that needs either rounding up or down to produce a final **answer**?
- **Check** the calculation and answer

### **MENTAL MATHS SKILLS**

Mental maths skills are taught in maths lessons and also in short (15-20 minute) sessions during the afternoon. Opportunities for short burst sessions of maths – e.g., when lining up, getting ready for lunch are not to be missed. See Beecroft Policy For Mental Calculations Strategies.

### **TIMES TABLES**

Knowledge of the times tables is a vital part of every child's education and one which should be undertaken both at school and at home. Learning the times tables off by heart is essential for the transition to upper Key Stage 2 where division, fractions, decimals, percentages and algebra are secured. Children who know their times tables facts will be able to answer questions more quickly and be able to focus on using other mathematical strategies in more complex problems rather than being slowed down by the multiplication calculation. Knowing times tables can also increase confidence levels as this particular part of the question becomes easy.

Termly assessments allow class teachers to identify the times table that each child needs to work on.

## **ASSESSMENT**

Assessment is continual and ongoing and informs future teaching, building a picture of the child's attainment and progress over time. Throughout the year, the children develop increased recall of their times tables and fluency when using number operations by frequently revisiting and practising these skills during morning maths and planned lessons – the spiral curriculum.

The children are assessed by their class teacher on the daily work carried out in lessons. Where possible errors are identified during lessons and children are taught to fix mistakes and complete corrections reflecting on what they found difficult and need more practice with. The teacher and pupils work together to monitor progress and to identify any misconceptions in areas of learning. Marking is related to the learning focus of the lesson.

Half-termly assessments (age-appropriate tests covering arithmetic and problem solving) are used to aid the teacher in their assessment role. This data allows teachers to monitor the progress of their pupils against targets set for the children and to track ability-based additional help groups within their class. It is essential that we assess what pupils can do independently.

## **MONITORING**

The mathematics subject leader has the overall responsibility for monitoring the standard of pupils' work, and the quality of the teaching - evaluating the impact. The work of the subject leader involves supporting colleagues in the teaching of mathematics, and providing a strategic lead and direction for the subject in the school so that it remains high profile.

The school leadership team and subject leader will observe mathematics lessons and give feedback to staff. This may involve working alongside and coaching staff to develop their skills and support to improve their practice. Work scrutinies take place termly to monitor progress and standards and for the purpose of moderation.

## **TARGETS**

All pupils are expected to succeed and make progress from their starting points.

Targets are set for pupils at the start of each term based on end of key stage results and previous class data, these are reviewed at the end of each term. On a short-term basis pupils have individual targets that they are working on in class – these are communicated by teacher through marking and 1:1 discussion with the pupils.

## **PRESENTATION**

Work is carried out in squared exercise books or on sheets (to be neatly stuck in the pupil's exercise book against the margin). The recording of work will enable children to clarify their own thinking, act as a point of future reference, communicate their mathematical thoughts to others and provide evidence, to a variety of audiences, of their work.

All maths work is to be written in pencil, with pupils using a ruler for margins and answer boxes to highlight the importance of neatness to enhance accuracy. The correct use of squared paper exercise books (e.g., 1 number in 1 square) consolidates the understanding of place value. Pupils up to Year 5 write in 1cm squared paper books. In Year 5 the use of fountain pens is introduced into maths books.

Digits must be clearly formed – if not, work is marked as incorrect.

## **RESOURCES**

All classes have a class set of their own age-appropriate resources in their classrooms along with class sets of maths textbooks for their year group. The shared school maths resources are kept in the meeting room. These are organised into trays and tubs and labelled for the different areas of learning. The resources are easily accessible, and teachers can borrow these and return them as needed.

Computing and the IWB is a major resource which can be used in maths for:

- data handling (use of databases, spreadsheets and graph drawing packages)
  - modelling of calculations
  - rapid recall of basic skills and times table facts in a game context for individual pupils.
- School subscribes to maths programmes including Times Table Rockstars and Education City.
- problem solving and investigating activities.

A comprehensive 'Maths Toolkit' has been set up by the maths subject leader and placed on the school network for all staff to access. It provides detailed support with planning, assessment and resources.

## **HOMEWORK**

Homework is used to support mathematical learning and practise of key skills and facts. Throughout both key stages specific tasks are set by the class teacher to support, review

and develop work started in class. Homework folders are a valuable tool to communicate with parents and show what the pupils are learning in school and how they can help their child. The amount of homework set is guided by the school Homework Policy.

The school website contains helpful information for parents about how they can help their child and has links to useful websites and PDF documents.

### **SPECIAL EDUCATIONAL NEEDS / ADDITIONAL HELP GROUPS**

Children with additional needs are supported by using practical resources and differentiated activities where needed. They are also further supported by additional support staff whenever possible. Where applicable, children's provision maps will incorporate suitable objectives from the National Curriculum or the EYFS curriculum and teachers keep these objectives in mind when planning work. In addition to quality first teaching, interventions also take place during the afternoons and focus on those children who may need more specific targeted input.

One to one/small group work is provided for pupils needing additional support. Teaching materials for small group work are carefully chosen using evidence-based programmes.

Pupil Premium pupils are also targeted, and additional teaching staff employed to ensure their progress across the school. Their progress is monitored half termly and tracked to ensure they make good progress with their learning. There is ongoing dialogue between ECT mentors, class teachers and the school leadership team about the progress of pupils.

Booster classes for year 6 are provided as additional support to children who, with intensive targeted support, achieve standards in line with expectations for their age.

### **WORKING WITH PARENTS**

At Beecroft we believe that it is vital that we keep parents informed about what their children are learning in the classroom and how they can help at home. We are aware that parents will have had very different maths experiences at school, and this may influence their confidence to support their child. Therefore, communicating information is important. Some of the strategies that we use include:

- holding workshops to explain maths strategies to parents.
- having parents in the classroom to look at pupils' workbooks during open mornings and evenings.

- creating displays for parents to look at.
- plan chunks of information to be provided for parents over the school year in a variety of formats.
- sending home curriculum letters
- giving advice about books, games and activities
- providing worked examples of calculations when homework is sent home.

Reporting to the parents is completed on a formal basis three times in an academic year; parents' consultation evenings in the autumn and spring terms where targets can be set and then reviewed, and a written report of a child's progress and achievement is given to parents in the summer term. However, teachers are always available for informal discussions with parents at a mutually convenient time during a normal school week.

### **ROLE OF THE MATHS LEADER**

The class teacher is responsible for the organisation of mathematics in his/her class based on the national curriculum. However, the maths leader is responsible for:

- the matching of the planning to the curriculum
- the annual report to the Governing Body
- the annual school improvement plan
- coaching, planning and working with new members of staff.
- lead by example in the way they teach in their own classroom.
- teach demonstration lessons when appropriate.
- the scrutiny of maths work from each class (books, homework and displays)
- lesson observations of teaching staff
- overseeing of target setting
- inform and support parents.
- attending numeracy courses regarding current issues
- keeping abreast of new initiatives
- organising and delivering INSET for teaching and non-teaching staff
- ordering maths materials/resources linked to the annual maths curriculum budget.
- analysis of data e.g., IDSR, ASP and FFT
- reviewing new materials

To be reviewed: July 2025