



**Beaumont  
Primary  
School**

A Learning Community Partnership

# **Policy For Mathematics**

## **Introduction**

The National Curriculum defines the purpose of study of mathematics thus:

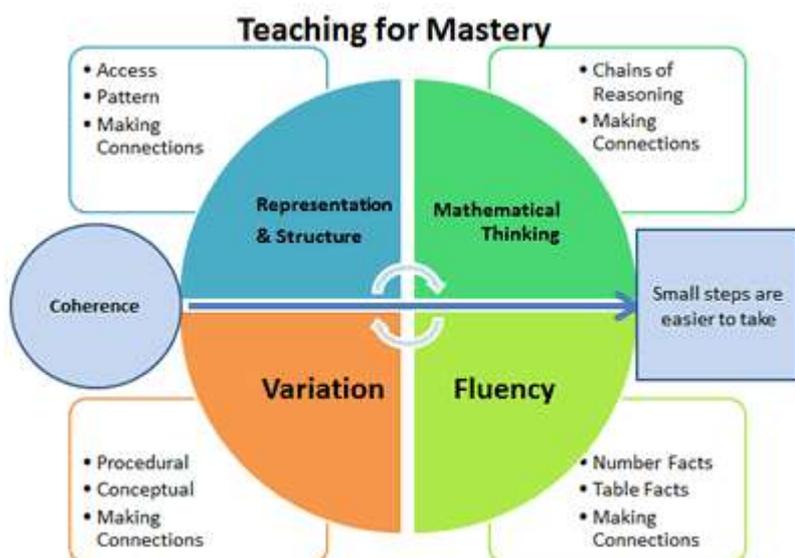
*“Mathematics is a creative and highly interconnected discipline that has been developed over centuries, providing the solution to some of history’s most intriguing problems. It is essential to everyday life, critical to science, technology and engineering, and necessary for financial literacy and most forms of employment. A high-quality mathematics education therefore provides 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 about the subject.” (DfE, National Curriculum in England 2013)*

This quote illustrates how mathematics not only pervades all aspects of our everyday lives but also helps us make sense of our world. With this in mind, the goals of this policy are twofold. We aim to promote both the acquisition of basic mathematical skills that are vital for the life opportunities of our children but also aspire to foster a sense of awe and wonder in the special qualities of mathematics.

Our aim is for all children to think mathematically, enabling them to reason and solve problems in a range of contexts. Our mathematics curriculum is based on White Rose Maths, a scheme that has been developed by experts to ensure every child can achieve excellence in mathematics. There is a strong emphasis on providing pupils with a deep understanding of the subject. This is achieved by an approach that starts with pupils manipulating concrete apparatus, moves on to pictorial representations of the concrete apparatus and finally links these pictorial representations to the abstract number system and concepts. This aims to ensure that pupils fully understand what they are learning.

## Mastery approach

White Rose Maths is a 'mastery' programme. The following extract from NCETM (National Centre for Excellence in the Teaching of Mathematics) explains what this means:



### *Coherence*

*Lessons are broken down into small connected steps that gradually unfold the concept, providing access for all children and leading to a generalisation of the concept and the ability to apply the concept to a range of contexts.*

### *Representation and Structure*

*Representations used in lessons expose the mathematical structure being taught, the aim being that students can do the maths without recourse to the representation.*

### *Mathematical Thinking*

*If taught ideas are to be understood deeply, they must not merely be passively received but must be worked on by the student: thought about, reasoned with and discussed with others.*

### *Fluency*

*Quick and efficient recall of facts and procedures and the flexibility to move between different contexts and representations of mathematics.*

### *Variation*

*Variation is twofold. It is firstly about how the teacher represents the concept being taught, often in more than one way, to draw attention to critical aspects, and to develop deep and holistic understanding. It is also about the sequencing of the episodes, activities and exercises used within a lesson and follow up practice, paying attention to what is kept the same and what changes, to connect the mathematics and draw attention to mathematical relationships and structure.*

*(The Five Big Ideas, NCETM, 2017)*

The essential idea behind the mastery approach is that all children should develop a deep understanding of the number system so that future learning can build on solid foundations. New concepts are broken down to small steps and first introduced using concrete materials. The teaching then moves on to using pictorial representations of these manipulatives. In the final stage these models and images are first linked to the abstract number system and mathematical symbols and then replaced by them, leading to a fully

mathematical depiction. Plenty of time is allocated for practising essential skills and knowledge and revisiting these leading to increased fluency. Reasoning and problem-solving activities that are built in every lesson allow for pupils to develop a deeper grasp of the concept. The approach aims for the children to acquire a comprehensive understanding of the concepts studied.

### **The curriculum**

We follow the national curriculum for mathematics which breaks the mathematical content to be taught in three strands: fluency, reasoning and problem solving. *The teaching of mathematics should aim to ensure that all pupils:*

1. **become fluent** in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
2. **reason mathematically** by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language
3. **can solve problems** by applying their mathematics to a variety of routine and nonroutine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions. (DfE, National Curriculum in England 2013)

With this in mind, our teachers plan for daily mathematics lessons that address all of these three areas (fluency, reasoning, problem solving) following White Rose Maths medium term planning. Year group curriculum maps include the content planned for each half term in mathematics. Class teachers adapt and edit White Rose materials to best suit the needs of their pupils.

We have adopted White Rose Maths Calculation Policies because they provide a clear progression through small steps in all four operations (addition, subtraction, multiplication and division). They are clear for anyone to follow and include an overview of the models and images that can support the teaching of different concepts. These policies can be found linked to this document.

The statutory framework for the early years foundation stage and national curriculum further break down the main aims of the mathematics curriculum at each key stage in the following way:

### **EYFS**

*Developing a strong grounding in number is essential so that all children develop the necessary building blocks to excel mathematically. Children should be able to count confidently, develop a deep understanding of the numbers to 10, the relationships between them and the patterns within those numbers. By providing frequent and varied opportunities to build and apply this understanding - such as using manipulatives, including small pebbles and tens frames for organising counting - children will develop a secure base of knowledge and vocabulary from which mastery of mathematics is built. In addition, it is important that the curriculum includes rich opportunities for children to develop their spatial reasoning skills across all areas of mathematics including shape, space and measures. It is important that children develop positive attitudes and interests in mathematics, look for patterns and relationships, spot connections, 'have a go', talk to adults and peers about what they notice and not be afraid to make mistakes. (Statutory framework for the early years foundation stage, DfE, 2021)*

### **Key Stage 1 (Years 1 and 2)**

*The principal focus of mathematics teaching in key stage 1 is to ensure that pupils develop confidence and mental fluency with whole numbers, counting and place value. This should involve working with numerals, words and the four operations, including with practical resources [for example, concrete objects and measuring tools]. At this stage, pupils should develop their ability to recognise, describe, draw, compare and sort different shapes and use the related vocabulary. Teaching should also involve using a range of measures*

*to describe and compare different quantities such as length, mass, capacity/volume, time and money. By the end of year 2, pupils should know the number bonds to 20 and be precise in using and understanding place value. An emphasis on practice at this early stage will aid fluency. Pupils should read and spell mathematical vocabulary, at a level consistent with their increasing word reading and spelling knowledge at key stage 1. (National curriculum in England, Mathematics programmes of study: key stages 1 and 2, 2013).*

### **Lower Key Stage 2 (Years 3 and 4)**

*The principal focus of mathematics teaching in lower key stage 2 is to ensure that pupils become increasingly fluent with whole numbers and the four operations, including number facts and the concept of place value. This should ensure that pupils develop efficient written and mental methods and perform calculations accurately with increasingly large whole numbers. At this stage, pupils should develop their ability to solve a range of problems, including with simple fractions and decimal place value. Teaching should also ensure that pupils draw with increasing accuracy and develop mathematical reasoning so they can analyse shapes and their properties, and confidently describe the relationships between them. It should ensure that they can use measuring instruments with accuracy and make connections between measure and number. By the end of year 4, pupils should have memorised their multiplication tables up to and including the 12 multiplication table and show precision and fluency in their work. Pupils should read and spell mathematical vocabulary correctly and confidently, using their growing word reading knowledge and their knowledge of spelling. (National curriculum in England, Mathematics programmes of study: lower key stage 2 – years 3 and 4, 2013).*

### **Upper Key Stage 2 (Years 5 and 6)**

*The principal focus of mathematics teaching in upper key stage 2 is to ensure that pupils extend their understanding of the number system and place value to include larger integers. This should develop the connections that pupils make between multiplication and division with fractions, decimals, percentages and ratio. At this stage, pupils should develop their ability to solve a wider range of problems, including increasingly complex properties of numbers and arithmetic, and problems demanding efficient written and mental methods of calculation. With this foundation in arithmetic, pupils are introduced to the language of algebra as a means for solving a variety of problems. Teaching in geometry and measures should consolidate and extend knowledge developed in number. Teaching should also ensure that pupils classify shapes with increasingly complex geometric properties and that they learn the vocabulary they need to describe them. By the end of year 6, pupils should be fluent in written methods for all four operations, including long multiplication and division, and in working with fractions, decimals and percentages. Pupils should read, spell and pronounce mathematical vocabulary correctly. (National curriculum in England, Mathematics programmes of study: upper key stage 2 – years 5 and 6, 2013).*

### **Inclusion**

The mastery approach in teaching mathematics ensures all pupils access to the full mathematics curriculum. This approach fits well with our school ethos of high expectations and motto of “There is no glass ceiling”. Differentiation occurs in the support and challenge provided to pupils to match their needs, not in the content taught. The use of concrete apparatus and models and images will help all pupils in developing their understanding of mathematical concepts but can be particularly useful for children with SEND. Though it is the expectation that the vast majority of the class will move through the content in broadly the same pace, there is still plenty of opportunity to cater for the pupils’ differing needs. This can be done by offering ‘digging deeper’ challenges to those pupils that grasp concepts quickly, allowing for more time for practice or extra explanation to those who need it. The teacher may also choose to provide extra support through extended use of manipulatives and / or models and images for those children who require it. Teaching assistants are used within the lesson to provide targeted support or challenge for (groups of) pupils who need it most. Children with complex SEND needs have individual targets that are appropriate to support their learning.

## **Assessment**

Assessment is an integral part of teaching and learning and is a continuous process. It is the responsibility of the class teacher to assess the pupils in their class. This can be achieved in many ways - through questioning, plenaries, marking and pupil self-assessment, as well as pre-learning, end-of-topic and end-of-term testing.

## **Monitoring and review**

The monitoring of mathematics teaching and pupil progress is the shared responsibility of class teachers, phase subject leaders and the senior leadership team (SLT). The work of the SLT and phase subject leaders includes supporting colleagues in the teaching of mathematics, keeping up to date with current developments as well as providing strategic lead and direction for the subject. The school's governing body receive regular updates to inform them of the plans to drive forward the teaching and learning of mathematics, as well as standards achieved to date.

Our 'teacher partnerships', a peer review and support system, aim to continuously improve the quality of teaching and learning at Beaumont and is a valuable tool for developing pedagogy in all subjects, including mathematics. We conduct lesson visits, speak to children and staff, analyse children's work and ultimately come together as a staff to critique what we are doing well and what we want to improve.

## **Resources and displays**

We are well resourced and the children have access to a number of practical apparatus such as Unifix and Multilink cubes, Numicon, counters and base 10 equipment. The use of these manipulatives is an integral part of teaching mathematics, particularly in the EYFS and KS1.

Maths displays in classrooms aim to provide children with models and images linked to what they are currently learning about (maths working walls) as well as contain key mathematical vocabulary to help children to learn and retain it.

## **Equality statement**

The board of governors and school are committed to equality and aim to ensure that all employees, job applicants, pupils or other members of the school community are treated fairly and with dignity and respect, regardless of their age, gender reassignment, marital status, pregnancy or maternity status, disability, race (including colour, nationality, ethnic or national origin), religion or belief, sex or sexual orientation.

Date: September 2022

Review date: September 2024

## **Linked documents**

### **Addition & Subtraction Calculation Policy:**

<https://assets.whiterosemaths.com/new-schemes/wrm-addition-subtraction-calculation-policy-july-2022.pdf>

### **Multiplication & Division Calculation Policy:**

<https://assets.whiterosemaths.com/new-schemes/Multiplication%20and%20Division%20calculation%20policy%20July%202022.pdf>