


# Mathematics Policy



## Costock CE Primary School

Where every child is a star! 

**'As God's children, we shine like Stars' Philippians 2 v.15**

### Our Promise

Every day at Costock Church School we are experiencing and learning;

Service to God, each other and ourselves, Truth, Agape and Respect

As we leave each day we take these Christian Values with us

**Approved by:** SLT **Date:** Autumn 2023

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### 1. Purpose of the policy

This policy reflects the aims and values of Costock CE Primary. It ensures all stakeholders, including staff, governors, parents and pupils, are working towards the same goals.

The purpose of this policy is to:

- › Set out a framework of mathematics for all teaching and non-teaching staff, giving guidance on planning, teaching and assessment
- › Demonstrate adherence to the National Curriculum objectives and guidelines
- › Provide clear information to parents and carers about what their children will be taught
- › Allow the governing board to monitor the curriculum
- › Provide Ofsted inspectors with evidence of curriculum planning and implementation

This policy will be available on our school website

### 2. Construction of Curriculum (Intent)

Here at Costock, we strongly believe that mathematics is a cross-curricular subject where pupils need to be able to move fluently between different mathematical ideas and calculations. Pupils should make connections across mathematical ideas to develop fluency, reasoning and competence in solving increasingly sophisticated problems. They should also apply their mathematical knowledge to other subjects. The expectation is that the majority of pupils will move through the programmes of study at roughly the same pace. Intervention can be used to ensure that children who struggle with a particular area catch up appropriately and effectively. Decisions about when to move onto the next programme of study should always be based on pupils' understanding and their readiness to progress to the next stage. Pupils who grasp concepts rapidly should be challenged through rich and sophisticated problems and investigations. These pupils should not accelerate to a new concept before others. Those who are not sufficiently fluent with earlier material should consolidate their understanding, through additional practice (intervention), before moving on. All pupils are given opportunity to use calculation skills in problem solving and reasoning activities in order to ensure that they can understand and apply skills in real life context.

**National Curriculum:** 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.

### 3. Aims and outcomes

The national curriculum for mathematics aims to ensure that all pupils:

- 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
- reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language
- can solve problems by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions

Mathematics is an interconnected subject in which pupils need to be able to move fluently between representations of mathematical ideas. The programmes of study are, by necessity, organised into apparently distinct domains, but pupils should make rich connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems. They should also apply their mathematical knowledge to science and other subjects.

The expectation is that the majority of pupils will move through the programmes of study at broadly the same pace. However, decisions about when to progress should always be based on the security of pupils' understanding and their readiness to progress to the next stage. Pupils who grasp concepts rapidly should be challenged through being offered rich and sophisticated problems before any acceleration through new content. Those who are not sufficiently fluent with earlier material should consolidate their understanding, including through additional practice, before moving on.

### 4. Teaching and learning

At Costock, we use a 'mastery' approach to mathematics. We use 'Master the Curriculum' teaching scheme which has a strong focus on being able to 'master' skills and apply these to a range of contexts which supports pupils understanding of mathematics in relation to the real world. We have a big focus on reasoning and vocabulary and encourage pupils to regularly talk about mathematics and prove statements with their reasoning. The above skills allow pupils to apply their learning in a range of contexts, including problem solving activities which take place daily. We ensure that 'retrieval practice' is a regular part of learning and pupils are given a chance to recall and strengthen previously learnt skills.

Mathematics is taught in mixed-age classes by class teachers. Lesson plans are based around the subject's long-term plan (see below). Short steps and skills taught are taught in blocks to ensure that pupils can 'master' skills before moving on. A typical maths lesson lasts approximately one hour. Pupils begin with daily 'fluent in four' retrieval activity which requires them to complete four mathematical problems which have been previously learnt. Pupils are challenged to retrieve previously learnt information which strengthens long term memory and retrieval strength. A teaching input is delivered which includes a range of: open/closed questioning; modelling; scaffolding; group discussions; specifically taught vocabulary; and skills being linked to problem solving and reasoning. Pupils have access to a range of mathematical resources to support their learning. There is then opportunity for pupils to independently practice learnt skills through differentiated activities. This practice uses conceptual and procedural variation to build fluency and

develop greater understanding of underlying mathematical concepts. Challenge questions/problems which link to other areas of mathematics encourage pupils to take their understanding to a greater depth level. 'Give me five' reflection activity at the end of the session allows pupils to review, reflect and respond to learning in a verbal, practical way and enables the teacher to gauge their depth of understanding.

## **5. Curriculum overview**

When teaching mathematics at Costock, we intend to provide a curriculum which caters for the needs of all pupils and sets them up with the necessary skills and knowledge for them to become successful in their future. We aim for the curriculum to be cross-curricular and pupils explore and use mathematics in a range of subjects. We incorporate sustained levels of challenge through varied and high quality questioning as well as activities. These activities have a focus on fluency, reasoning and problem solving. Pupils are required to explore maths in depth, using mathematical vocabulary to reason and explain their workings. A wide range of high-quality resources are used and pupils are taught to show their workings wherever suitable. They are taught to explain their choices of methods and develop their reasoning skills using mathematical vocabulary. We encourage resilience through the whole school growth mindset approach. It is accepted that struggle and mistakes are often a necessary step in learning. Our curriculum allows children to better make sense of the world around them using their knowledge of mathematics. We encourage children to relate the pattern between mathematics and everyday life.

### **5.1 Early Years Foundation Stage (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.

### **5.2 Key Stage (KS) 1**

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 4 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.

## **5.3 Key Stage (KS) 2**

### **Lower KS2 (year 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 4 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.

### **Upper KS2 (year 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 4 operations, including long multiplication and division, and in working with fractions, decimals and percentages.

Pupils should read, spell and pronounce mathematical vocabulary correctly.

For more details, please see 'Programmes of study' (below) and maths progression maps (school website).

## 5.4 Programmes of study

### EYFS

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Getting To Know You		Match, sort and compare		Talk about measure and patterns		It's me 1,2,3		Circles and triangles	1,2,3,4,5		Shapes with 4 sides
Spring	Alive in 5		Mass and capacity	Growing 6,7,8		Length, height and time		Building 9 and 10		Building 9 and 10	Explore 3-D shapes	
Summer	To 20 and beyond		How many now?	Manipulate, compose and decompose		Sharing and grouping		Visualise, build and map			Make connections	Consolidation

### Year 1

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Number: Place Value (within 10)	Number: Place Value (within 10)	Number: Place Value (within 10)		Number: Addition and subtraction (within 10)		Number: Addition and subtraction (within 10)		Number: Addition and subtraction (within 10)		Geometry: Shape	Consolidation
Spring	Number: Place Value (within 20)	Number: Place Value (within 20)		Number: Addition and subtraction (within 20)	Number: Addition and subtraction (within 20)		Number: Place Value (within 50)		Measurement: Length and Height		Measurement: Mass and Capacity	
Summer	Number: Multiplication and Division	Number: Multiplication and Division		Number: Fractions	Number: Fractions	Geometry: Position and Direction	Number: Place Value (within 100)	Number: Place Value (within 100)	Measurement: Money	Measurement: Time		Consolidation

### Year 2

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Number: Place Value	Number: Place Value	Number: Place Value		Number: Addition and Subtraction	Number: Addition and Subtraction	Number: Addition and Subtraction	Number: Addition and Subtraction		Geometry: Shape	Geometry: Shape	
Spring	Measurement: Money	Measurement: Money	Number: Multiplication and Division	Number: Multiplication and Division	Number: Multiplication and Division			Measurement: Length and Height		Measurement: Mass, Capacity, Temperature		
Summer	Number: Fractions	Number: Fractions	Number: Fractions	Measurement: Time	Measurement: Time	Statistics		Statistics	Geometry: Position and Direction		Consolidation	

### Year 3

Master the Curriculum												
	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Number: Place Value	Number: Place Value	Number: Place Value	Number: Addition and Subtraction	Number: Addition and Subtraction	Number: Addition and Subtraction	Number: Addition and Subtraction	Number: Addition and Subtraction	Number: Multiplication and Division		Number: Multiplication and Division	
Spring	Number: Multiplication and Division	Number: Multiplication and Division		Measurement: Length and Perimeter	Measurement: Length and Perimeter		Number: Fractions	Number: Fractions		Measurement: Mass & Capacity	Measurement: Mass & Capacity	
Summer	Number: Fractions		Measurement: Money		Measurement: Time	Measurement: Time	Measurement: Time	Geometry: Shape	Geometry: Shape	Statistics		Consolidation

### Year 4

Master the Curriculum												
	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Number: Place Value	Number: Place Value	Number: Place Value	Number: Place Value	Number: Addition and Subtraction	Number: Addition and Subtraction		Measurement: Area	Number: Multiplication and Division	Number: Multiplication and Division	Number: Multiplication and Division	Consolidation
Spring	Number: Multiplication and Division	Number: Multiplication and Division	Number: Multiplication and Division	Measurement: Length and Perimeter	Measurement: Length and Perimeter	Number: Fractions	Number: Fractions	Number: Fractions		Number: Decimals	Number: Decimals	
Summer	Number: Decimals	Number: Decimals	Measurement: Money	Measurement: Money	Measurement: Time		Consolidation	Geometry: Shape	Geometry: Shape	Statistics	Geometry: Position and direction	

### Year 5

Master the Curriculum												
	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Number: Place Value	Number: Place Value	Number: Place Value	Number: Addition and Subtraction		Number: Multiplication and Division	Number: Multiplication and Division		Number: Fractions A	Number: Fractions A		
Spring	Number: Multiplication and Division	Number: Multiplication and Division		Number: Fractions B		Number: Decimals and Percentages	Number: Decimals and Percentages	Number: Decimals and Percentages	Measurement: Perimeter and Area		Statistics	
Summer	Geometry: Shape	Geometry: Shape		Geometry: Position and Direction		Number: Decimals	Number: Decimals		Number: Negative Numbers	Measurement: Converting Units		Measurement: Volume

## Year 6



The image shows a 'Maths Progression Map' for Year 6, organized by term (Autumn, Spring, Summer) and week (Week 1 to Week 12). The map details the topics covered in each week, such as 'Number: Place Value', 'Number: Addition, Subtraction, Multiplication and Division', 'Number: Fractions A', 'Number: Fractions B', 'Measurement: Converting Units', 'Number: Ratio', 'Number: Algebra', 'Number: Decimals', 'Number: Fractions, Decimals and Percentages', 'Measurement: Perimeter, Area and Volume', 'Statistics', 'Geometry: Shape', 'Geometry: Position and Direction', 'Investigations, Consolidation and Problem Solving', and 'Investigations, Consolidation and Problem Solving'.

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Number: Place Value	Number: Place Value	Number: Addition, Subtraction, Multiplication and Division	Number: Addition, Subtraction, Multiplication and Division	Number: Addition, Subtraction, Multiplication and Division			Number: Fractions A		Number: Fractions B		Measurement: Converting Units
Spring	Number: Ratio	Number: Ratio	Number: Algebra	Number: Algebra	Number: Decimals	Number: Decimals	Number: Fractions, Decimals and Percentages	Number: Fractions, Decimals and Percentages	Measurement: Perimeter, Area and Volume	Measurement: Perimeter, Area and Volume	Statistics	
Summer	Geometry: Shape	Geometry: Shape		Geometry: Position and Direction	Investigations, Consolidation and Problem Solving						Investigations, Consolidation and Problem Solving	

For more details about programmes of study, please see 'maths progression maps' (school website).

## 6. Cross-curricular links and SMSC

Mathematics shares links with the following subjects:

- › Science: mathematics can reveal what scientists have discovered by helping pupils find relationships between a hypothesis and the data collected. Measurement is a vital skill needed in order to collect data in a variety of ways when working scientifically.
- › English: development of literacy skills through mathematical reasoning
- › History: analysing numerical data and understanding chronological terminology
- › RE: deeper understanding of the chronology of religion and time
- › ICT: many mathematical links to ICT (coding, data, formatting, working systematically)
- › Geography: geographical measurement of distance, volume, temperature and time. Map skills involve several aspects of mathematics, such as co-ordinates and scale.
- › Spiritual, moral, social and cultural (SMSC): encourages pupils to delve deeply into maths and make sense of the world around them. Pupils are encouraged to challenge themselves and make mistakes without the fear of failure. This is important in order for pupils to build their self-esteem within mathematics.
- › British values: Pupils take turns to listen and contribute to discussions. Pupils regularly make mistakes and learn from them, developing their resilience.

## 7. Assessment and recording

### 7.1 Assessment

Costock CE Primary uses assessment to enable staff to understand what pupils have learnt before, what they need to learn now and what they will learn next.

Effective feedback is crucial to learning in mathematics and pupils regularly receive visual and verbal feedback from class teachers and teaching assistants during the lesson. Research tells us that instant verbal/visual feedback is vital to successful learning in mathematics, therefore, highly skilled specific feedback is planned into lessons.

Pupils also receive effective feedback through teacher assessment through written feedback in line with the success criteria. Success criteria are shared with the children prior to independent work. WALT (what I'm learning today) and WILF (what I'm looking for) checklists are provided for pupils and are referred to



throughout the lesson. The success criteria in mathematics is linked directly to skills and knowledge required to complete the independent practice tasks. At the end of the lesson, pupils review their work against the success criteria checklists as a means to identifying strengths and target areas. The teacher, who also assesses the outcome against these criteria during marking, then verifies the pupils' judgements by completing success criteria checklists.

Regular, informal written assessments are also regularly used to assess pupils on previously learnt content. These are used to provide accurate assessment for both pupils and teachers, as well as an opportunity for retrieval practice for pupils.

### **Formative assessment**

Short-term assessments are part of each lesson. Observations and careful questioning enable teachers to adjust lessons and brief other adults in the class if necessary. The lesson structure of Master the Curriculum is designed to support this process and the reflection task at the end of the each lesson also allows misconceptions to be addressed.

At the end of each blocked unit of work, pupils are given opportunity to complete a short end of unit assessment. This consists of a range of arithmetic and problem solving questions, as well as an opportunity to demonstrate greater depth. The outcome of this mini assessment is used to guide future teaching and intervention. Marking and verbal feedback ensure that gaps in understanding can be addressed before the next block is taught.

### **Summative assessment**

Assessment papers/tests are used throughout the year to guide summative assessment and identify pupils' ongoing target areas. These assessments papers, alongside teacher formative assessment, contributes to inform the whole school tracking of attainment and progress for each pupil via our assessment grids.

At the end of each school term, year and Key Stage, pupils will be assessed within 1 of the following bands:

- Pre-Key Stage (PKS)
- Working Towards the curriculum (WT)
- Working at Expected (EXP)
- Working at Greater depth (GDS)

### **Marking**

Children receive regular feedback and marking follows the school's Feedback and Marking Policy. (See school website)

## **7.2 Recording**

In mathematics, pupils will record their learning in the following ways:

- Maths books in KS1 and KS2
- Reception-Individual Learning Journey. This may take the form of photographs, pictures, notes or written work, and may be worksheet-based or fully independent.

## **8. Resources**

### **8.1 Textbooks and other equipment**

Master the Curriculum provides a wide range of high-quality resources, aligned with the White Rose Maths Hub scheme, to support the teaching and learning in mathematics.

- High quality editable and differentiated planning schemes
- Editable and differentiated teaching slides

- NCTEM ready to progress supporting resources
- Differentiated practical activities
- Differentiated fluency worksheets
- Differentiated problem solving and reasoning activities
- Retrieval based revision starters
- Differentiated assessments
- Specific mathematical vocabulary resources

Alongside our maths scheme resources, we have a wide range of practical resources which are regularly used in lessons to support pupils with understanding of mathematical concepts, as well as to support pupils with independent work. Pupils are encouraged to use mathematical resources to solve practical problems and work mathematically in cross-curricular subjects.

## 9. Roles and responsibilities

### 9.1 Headteacher

The headteacher at our school will:

- › Support the subject leader but also hold them to account for the effectiveness of the subject
- › Support staff through the provision of training and resources
- › Monitor the planning and delivery of the subject
- › Ensure the requirements of the National Curriculum are met
- › Ensure this policy is reviewed according to the timescales set out

### 9.2 Subject leader

The subject leaders at our school will:

- › Prepare and review subject policy and curriculum plans
- › Promote the study of the subject throughout the school
- › Monitor the teaching and assessment of the subject
- › Attend appropriate CPD
- › Stay informed regarding developments in the study and teaching of the subject
- › Evaluate resources
- › Provide training and CPD to staff on the subject curriculum and its delivery, and keep them informed about subject developments nationally
- › Assess the impact of the subject curriculum on pupils' learning and development
- › Meet with governors and relay information on the subject and how it is being taught

### 9.3 Link governor

The link governor responsible for mathematics at our school will:

- › Monitor the impact of the subject across the school and on pupils
- › Monitor teacher workload and professional development
- › Ensure subject action plans are suitable

- › Monitor the quality of resources
- › Keep track of pupil and parent engagement with the subject
- › Keep up to date with the curriculum (what's taught, why it's taught, and how it's taught)

## 9.4 Classroom teacher

Classroom teachers at our school will:

- › Teach and assess the subject according to the principles laid out in this policy
- › Provide intervention for pupils if appropriate
- › Report to the subject leader
- › Maintain subject knowledge and appropriate CPD

## 9.5 Parents

The parent community at our school will:

- › Make sure their children are prepared for learning
- › Monitor the completion of home learning

## 10. Inclusion

Teachers set high expectations for all pupils in mathematics. They will use appropriate assessment to set ambitious targets and plan challenging work for all groups, including:

- › More able pupils
- › Pupils with low prior attainment
- › Pupils from disadvantaged backgrounds
- › Pupils with special educational needs (SEN)
- › Pupils with English as an additional language (EAL)

Teachers will plan lessons so pupils with SEN and/or disabilities can study mathematics, wherever possible, and ensure that there are no barriers to every pupil achieving.

Teachers will also take account of the needs of pupils whose first language is not English. Lessons will be planned so that teaching opportunities help pupils to develop their English, and to support pupils to take part in maths.

Further information can be found in our statement of equality information and objectives, and in our SEN policy and information report.

## 11. Links to other policies

This subject policy links to the following policies and procedures:

- › Teaching and Learning Policy
- › Curriculum policy
- › Assessment policy
- › Feedback and Marking Policy
- › SEN policy

## **12. Monitoring and review**

The mathematics co-ordinator is responsible for the monitoring of the implementation of this policy. The leader reports to the head teacher on the effectiveness of the policy and to the governing body upon its review.

This policy will be reviewed by SLT every 3 years or sooner if required.