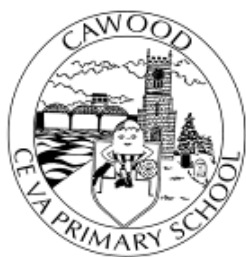


# CAWOOD CHURCH OF ENGLAND (VA) PRIMARY SCHOOL



## Mathematics Policy (2018 -2019)

Document Status			
<b>Date of next review</b>	September 2020	<b>Responsibility</b>	Teaching and Learning Committee
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This policy outlines the methods used when teaching the Mathematics. The aim is to ensure there is consistency of teaching, with progression throughout the school.

Children are introduced to the concepts and calculation through practical, oral and mental activities. As children begin to understand the underlying ideas they develop ways of recording to support their thinking and calculation methods, use particular methods that apply to special cases, and learn to interpret and use the signs and symbols involved.

Over time children learn how to use models and images, such as bar models or empty number lines, to support their mental and informal written methods of calculation. As children's mental methods are strengthened and refined, so too are their informal written methods. These methods become more efficient and succinct and lead to efficient written methods that can be used more generally. These written methods are recorded in Maths journals.

When faced with a calculation, children are able to decide which method is most appropriate and have strategies to check its accuracy. At whatever stage in their learning, it must still be underpinned by a secure and appropriate knowledge of number facts, along with those mental skills that are needed to carry out the process and judge if it was successful. The following guidance sets out the stages of development that lead to an efficient written method in the four areas of calculation.

**All adults who work with children in mathematics have a copy of the Calculations Guidance. A copy is also available in each classroom for supply teachers who work in school.**

The overall aim is that when children leave Cawood Primary School they:

- have a secure knowledge of number facts and a good understanding of the four operations;
- are able to use this knowledge and understanding to carry out calculations mentally and to apply general strategies when using one-digit and two-digit numbers and particular strategies to special cases involving bigger numbers;

- make use of diagrams and informal notes to help record steps and part answers when using mental methods that generate more information than can be kept in their heads;
- have an efficient, reliable, compact written method of calculation for each operation that they can apply with confidence when undertaking calculations that they cannot carry out mentally;
- use a calculator effectively (although no longer a requirement in the Programmes of Study (2014), using their mental skills to monitor the process, check the steps involved and decide if the numbers displayed make sense.

Calculation methods are underpinned by the children's knowledge of rapid recall facts. It is essential therefore that the children are meeting the targets set for these in order to be able to apply the methods taught. A short period daily is set aside for fluency outside of the daily maths lesson.

## **Teaching for Mastery 2018**

This document defines the elements of primary mathematics teaching for mastery at Cawood.

Much of the pedagogy is based on the NCETM's research into primary mathematics teaching in East Asian jurisdictions, especially Shanghai, and on the experience of English primary schools involved in the China-England mathematics education research project. It is fully consistent with the Primary National Curriculum in England.

### **Rationale**

This policy is the formal statement of intent for teaching for mastery in mathematics at Cawood. The policy facilitates how we, as a school, have adapted our lessons to incorporate the elements of primary mathematics teaching for mastery and how we follow the National Curriculum requirements. This policy has the full agreement of the Governing Body. The implementation of this policy is the responsibility of all teaching staff.

### **Aims**

At Cawood, we aim to:

- provide our pupils with a mathematics curriculum which will produce confident individuals who are numerate, creative, independent, inquisitive, enquiring and resilient.
- provide a stimulating environment and adequate resources so that pupils can develop their mathematical skills to their full potential
- ensure all pupils become **fluent** in mathematics through varied and frequent practise 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.
- enable our pupils to **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

Our 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 the pupil's 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 children who are not sufficiently fluent with earlier materials should consolidate their understanding, including through additional practice, before moving on.

## Teaching and Learning

- Teachers will follow the National Curriculum (introduced 2015-2016), using the appropriate programme of study for their specific year group
- Children spend ten to fifteen minutes per day, in addition to their daily maths lesson, developing their skills of instant recall and fluency.
- The children are shown how to use resources to visualise concepts and ideas and ultimately to aid their understanding. All children, regardless of ability, are shown visual representations of the concepts taught.
- Pupils are provided with a variety of opportunities to develop and extend their mathematical skills, including: group work, with either the teacher or class support; paired work; whole class teaching and individual work
- Children are taught efficient written methods of calculation as stated in the school's Calculation Policy. (see Calculation Policy for further guidance)
- Lesson Challenges and Success Criteria/ Steps to Success will be shared with the children throughout each maths lesson. Reasoning, problem solving, lesson challenges and consolidation of skills will be recorded in the child's book maths journal.
- Pencils will be used in all maths books and all lines drawn will be drawn with a ruler. Children set out their work carefully and accurately.
- The development of our pupils' mental recall will be supported by daily practise and maths challenges forming part of the main lesson.
  - Assessment of the objectives will be through the use of MNP resources based on teacher observations when working with the child.
  - Teachers will ensure all children have easy access to a variety of resources to help to visualise abstract concepts and also to allow them work independently throughout all age ranges
- Teachers should make full use of MNP resources (or white Rose materials for Y6, as well as MNP resources. Reception use Glowmaths.
- Teachers will, wherever appropriate, include mathematics in other subjects including the creative curriculum, and in particular Science for example, to support the children's understanding and application of statistics

## Teaching principles

- Teaching is underpinned by a belief in the importance of mathematics and that the vast majority of children can succeed in learning mathematics in line with national expectations for the end of each key stage. We expect 90% of children to reach ARE.
- The whole class is taught mathematics together, with no differentiation by acceleration to new content. Only in exceptional circumstances will children's needs be catered for through differentiation. Some children who are born in late August or who have special educational needs may access Maths No Problem in the year group below their chronological age. The learning needs of individual pupils are addressed through careful scaffolding, skilful questioning and appropriate rapid intervention, in order to provide the necessary support and challenge. This will include bespoke pre and post teaching to individual needs by either a teacher or skilled teaching assistant.
- Factual knowledge (e.g. number bonds and times tables), procedural knowledge (e.g. formal written methods) and conceptual knowledge (e.g. of place value) are taught in a fully integrated way and are all seen as important elements in the learning of mathematics.

- The reasoning behind mathematical processes is emphasised. Teacher/pupil interaction explores in detail **how** answers were obtained, **why** the method/strategy worked and **what** might be the most efficient method/strategy.
- Interim methods (e.g. expanded methods for addition and multiplication) to support the development of formal written algorithms are used for a short period only, as stepping stones into efficient, compact methods.
- Precise mathematical language, couched in full sentences, is **always** used by teachers and teaching assistants, so that mathematical ideas are conveyed with clarity and precision. Pupils are required to do the same (e.g. when talking about fractions, both the part and its relationship to the whole are incorporated into responses: "The shaded part of the circle is one quarter of the whole circle").
- Conceptual variation and procedural variation are used extensively throughout teaching, to present the mathematics in ways that promote deep, sustainable learning.
- Carefully devised exercises employing variation are used. These provide **intelligent practice** that develops and embeds fluency and conceptual knowledge.
- Sufficient time is spent on key concepts (e.g. multiplication and division) to ensure learning is well developed and deeply embedded before moving on.
- Frequent additional practice, outside the lesson, is encouraged, in order to develop pupils' fluency and consolidate their learning.

### **Lesson design**

- Programmes of study and lesson content are carefully sequenced following the plans set out in MNP, in order to develop a coherent and comprehensive conceptual pathway through the mathematics.
- Learning is broken down into small, connected steps, building from what pupils already know.
- Difficult points and potential misconceptions are identified in advance and strategies to address them planned.
- Key questions are planned, to challenge thinking and develop learning for all pupils.
- Contexts and representations are carefully chosen to develop reasoning skills and to help pupils link concrete ideas to abstract mathematical concepts.
- The use of high quality materials and tasks to support learning and provide access to the mathematics, is integrated into lessons. These may include textbooks, visual images and concrete resources.

### **Features of teaching**

- The main 'teaching' part of the lesson is approximately 25 to 35 minutes depending on the age and the content of the lesson. This allows for an additional time to be spent working on practice and any further intervention or teaching points in the lesson.

- Lessons are sharply focused on the learning objective; digression is generally avoided.
- Key new learning points are identified explicitly.
- There is regular interchange between concrete/contextual ideas and their abstract/symbolic representation.
- Mathematical generalisations are emphasised as they emerge from underlying mathematics, which is thoroughly explored within contexts that make sense to pupils.
- Making comparisons is an important feature of developing deep knowledge. The questions “What’s the same, what’s different?” are often used to draw attention to essential features of concepts.
- Repetition of key ideas, often in the form of whole class recitation, is used frequently. This helps to verbalise and embed mathematical ideas and provides pupils with a shared language to think about and communicate mathematics.
- Teacher-led discussion is interspersed with short tasks involving pupil to pupil discussion and completion of short activities.
- Desks are arranged so that all pupils can face the teacher and can work in pairs or small groups when needed.
- Formative assessment is carried out throughout the lesson; the teacher regularly checks pupils’ knowledge and understanding and adjusts the lesson accordingly.
- Gaps in pupils’ knowledge and understanding are identified early by in-class questioning and by reviewing learning as pre assessment. Potential misconceptions are addressed rapidly through individual or small group intervention, either on the same day or the next day, separate from the main mathematics lesson, to ensure all pupils are ready for the next lesson.
- Short homework/out of class tasks are set, to consolidate learning and provide formative feedback.
- Teachers discuss their mathematics teaching regularly with colleagues, sharing teaching ideas and classroom experiences in detail and working together to improve their practice.

### **Homework**

Lessons will provide opportunities for our children to practise and consolidate their skills and knowledge and to develop and extend their techniques and strategies – homework will be provided to support this. Children will be encouraged to practice daily, at home. This includes any tasks set by the class teacher as well as online programs such as Times Table Rockstars. We acknowledge the importance of parental involvement and hope that parents will help their child extend the above through short and focused homework tasks and activities.

## **Assessment and feedback**

Assessment and feedback are regarded as an integral parts of teaching and learning in a continuous process. It is the responsibility of the class teacher to assess all pupils in their class. At Cawood, we are continually assess our pupils and record their progress. We strive to make our assessment purposeful, allowing us to match the correct level of work to the needs of the pupils, thus benefiting the pupils and ensuring progress.

Information for assessment will be gathered in various ways: by talking to the children, observing their work, marking their work, etc. Teachers will use these assessments to plan further work.

- Teacher assessment will be on going, with a more formal assessments with the MNP tests and the NFER taking place at the end of each term.
- Children are assessed against their Age related Expectations (ARE).
- In EYFS, assessment will begin with a baseline assessment during Autumn 1, followed by assessments as set out in our schools EYFS policy

## **Role of the Mathematics Leader**

The Maths Leader is responsible for mathematics throughout the school. This includes:

- Leading by example by setting high standards in their own teaching
- Ensuring teachers understand the requirements of the new National Curriculum and support them to plan lessons, where needed
- Preparing, organising and leading CPD and joint professional development, sometimes supported by consultants
- Working with the Inclusion Leader
- Observing colleagues from time to time with a view to identifying the support they need
- Attending CPD and disseminate knowledge through staff meeting/INSET
- Keeping parents informed about mathematics issues
- Discusses regularly, the progress mathematics in school, with the Headteacher/Assistant Headteacher, SMT and the Maths link governor.
- Monitor and evaluate mathematics provision in the school by conducting regular work scrutiny, learning walks and assessment data analysis and feed back to the Headteacher and Assistant Headteacher
- Ensures that each classroom has the appropriate resources required to deliver the curriculum effectively and, where necessary, use maths budget to purchase resources and fill gaps.

This policy was reviewed in September 2018