THE CAMBRIDGE PRIMARY SCHOOL

'Inspiring Minds Together'

MATHEMATICS POLICY

2025

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Mathematics Policy

INTENT

At The Cambridge Primary School, we want our pupils to enjoy maths, enjoy the thrill of problem solving, and look forward to the challenges it brings. We want our children to be fluent in basic number facts, so they see maths in everyday life as accessible to them and something they have ownership of. Through embedding a mastery approach to teaching maths, supported by a comprehensive bank of resources (White Rose) we provide interactive and engaging lessons that develop curiosity, creativity, resilience, and a growth mindset. We endeavour to incorporate real-world scenarios into our maths classes to help learners understand the function of mathematics in the world around them and to motivate them to become lifelong learners and problem solvers. Maths is taught in whole-class settings across the school, with included support and chances for deeper challenges to ensure that learning is accessible to all students.

We encourage our learners to discover how mathematics aids our understanding of the world. It enables us to appreciate patterns and relationships in everyday life.

IMPLEMENTATION

Across the school mixed ability pairs or groups are used to enable all to succeed. Maths lessons are split into three main sections. Retrieval and number chanting, a new learning intention and an applied section where the learning is extended. Within the new learning and applied learning, teachers will first explicitly model the skill or knowledge to be taught (I do), followed by an extended time where pupils work together to investigate the learning intention (We do). This is followed by independent tasks and an in class assessment to check all have achieved the learning intention (You do).

Our implementation:

- A consistent, systematic, high quality, whole school approach to teaching mathematics using the White Rose scheme.

Retrieval Quiz:

1. Grid layout on slides
2. Yesterday, last week, last term, last year.
3. Teacher checking for misconceptions / support.
4. Additional challenge for fast graspers

Number chanting

1. Whole class participating
2. Whole school timetable followed (continually reviewed and updated)
3. Temporary visual scaffold
4. Counting stick or approved physical resource

New learning, explicit teaching (I do)

1.	High quality mathematical language.
2.	Metacognitive talk
3.	Model at least two examples
4.	Worked example left on display.
5.	Steps to success if applicable
6.	Key vocabulary on slides

Investigative learning (We do)

1.	Children work in pairs/ groups to investigate problems.
2.	High quality mathematical language from children / adults.
3.	Concrete, pictorial abstract approach as applicable.
4.	Problem pairs on slides.
5.	Multiple examples including non-examples
6.	Probing questions.
7.	Variation in examples to tease out concepts
8.	Use of stem sentences (from a staff stem sentence bank)
9.	Assessment for learning to move on. 90% achieve success.

Independent practise (You do)

1.	Short part of lesson, written outcome as applicable.
2.	Children work independently, focused.
3.	Answer sheet provided in planning for teacher.
4.	LSA / Teacher support 10%
5.	Challenge in place for fast graspers.
6.	All work marked in lesson to reduce teacher work-load.

- Additional same day intervention are considered for children struggling with mathematical concepts or deepening understanding
- Self assessment is present in every lesson to encourage reflection, ownership and growth mindset
- Monitoring of the planning, teaching and assessment termly to ensure mathematics is of high quality and consistent across the school.
- Planned opportunities throughout the curriculum to extend beyond ‘mathematics time’ so learning is applied, reinforced and relevant connections identified for the children.
- Close monitoring of children making the slowest progress through regular assessments, data analysis and pupil progress meetings with provision adjusted accordingly.
- Summative assessment at three points in the year to guide summative judgements and identify any gaps in knowledge

- Formative assessment is used daily and recorded through our assessment system to support with summative assessment judgements
- All staff are trained to be experts in mastery maths through CPD and additional training day
- Access to lessons on White Rose online hub. These lessons are used for daily teaching and training is available for all staff

Learning Characteristics

We consider it is of vital importance that children learn and develop positive characteristics as individuals alongside academic knowledge and skills. These are qualities that will ensure they continue to learn and thrive throughout their school life and beyond. We will encorouge the learning of these characteristics in maths lessons by providing opportunites for the children to:

Brave:

- Find their own methods to solve a problem
- Share their 'marvellous mistakes' to help their friends learn
- Self assess their own work and reflect on the level of support they may need

Innovate:

- Create challenges for their group or maths partner
- Develop their reasoning skills to apply their understanding to real life contexts
- Invent their own methods for problem solving

Collaborate:

- Practically explore new problems in small groups or with maths partners
- Mixed ability groups for practical problem solving and discussion
- Children are encouraged to discuss every problem with their partner or group to find soloutions and address misconceptions

Ownership:

- Children to choose if they need to work on a table with adult support
- Children to self assess at the end of every lesson
- Challenge tasks are available for each lesson
- Children are able to seek resources that they feel they need during lessons in all year groups

Meeting the needs of all our learners

At the Cambridge primary school we believe that maths is not innate but is increased by effort. Therefore, maths is taught in mixed ability groups to ensure that no child has a label. Group work provides peer support and the stimulous of discussion with children of all abilities. This enables each group to utilize the range of skills that different children may have including; having a good memory, good practical skills or good speaking and listening skills. These skills can be pulled together in a team to solve problems. Children approach each lesson in a practical way (concrete) before moving on to pictoral and then when they are confident, they are able to move on to independent work (abstract.)

We believe that success in mathematics is possible for every child. Adult support is available for those who need it within each lesson and additional intervention is available in the afternoon if concepts have not been fully embedded within the lesson. Children with a more complex level of need may need to be supported with a more individulalised curriculum during some topics.

Children are stretched and challenged to deepen their understanding by: reasoning tasks where they have to explain their problem solving, posing maths problems to their friends and innovation tasks such as inventing a new method to solve a problem or creating a poster with maths rules.

Parents as partners

We recognise and value the important role parents play in education as they know their child best. Consequently, we encourage parents to engage in an active partnership with the school. Weekly fluency homework is sent home so that parents can help children to consolidate their learning from that week. Parent workshops will be held so that parents can watch children being taught using a mastery approach and gain a better understanding of how to support mastery at home. In addition, there are support videos and calculation policies on the school website to support with methods used in this approach.

IMPACT

At the Cambridge Primary School, the impact will be seen:

- Learning walks and internal monitoring to ensure the teaching and assessment of mathematics is of high quality and consistent across the school.
- External moderation of schools within the EEEA Trust
- Our tracking and assessment system (Scholarpack) which enables formative and summative assessment to be recorded so that leadership and class teachers have a clear view of progress and of any children who are not on track to make expected progress.
- Pupil progress meetings
- Sufficient and effective additional support for children in danger of falling behind or those experiencing significant difficulty, to enable them to keep up
- Fast feedback (pupil conferencing in lessons) is provided to the children to address misconceptions immediately.
- Summative assessments at three points in the year to guide, not dictate, teacher judgements

Maths Mastery

"In mathematics, you know you've mastered something when you can apply it to a totally new problem in an unfamiliar situation."

Dr. Helen Drury

Maths mastery lessons have pace and teachers are facilitators who ask rich questions to extend children's learning. Every step is deliberate, purposeful and prescise. If children are struggling with a concept, more time us spent supporting and building their understanding.

Pupils are invited to demonstrate their soloutions and explain their thinking. Lessons include a mixture of short tasks, explanation, demonstration and lots of practice to reinforce learnng. Mastery works best when children are secure in their number facts and can free up their working memory for problem solving. At the Cambridge Primary School we have, daily fluency lessons prior to our maths lessons to practice our number facts.

White Rose maths

White Rose maths is the scheme that we use to deliver mastery teaching. It is based on the Concrete, Pictorial, Abstract (CPA) approach to teaching. CPA is a highly effective approach to teaching that develops a deep and sustainable understanding of maths in pupils. Often referred to as the concrete, representational, abstract framework, CPA was developed by American psychologist Jerome Bruner. It is an essential technique within the Singapore method of teaching maths for mastery.

Background to the CPA framework

Children (and adults!) can find maths difficult because it is abstract. The CPA approach builds on children's existing knowledge by introducing abstract concepts in a concrete and tangible way. It involves moving from concrete materials, to pictorial representations, to abstract symbols and problems. The CPA framework is so established in Singapore maths teaching that the Ministry of Education will not approve any teaching materials that do not use the approach.

Concrete step of CPA

Concrete is the "doing" stage. During this stage, students use concrete objects to model problems. Unlike traditional maths teaching methods where teachers demonstrate how to solve a problem, the CPA approach brings concepts to life by allowing children to experience and handle physical (concrete) objects. With the CPA framework, every abstract concept is first introduced using physical, interactive concrete materials.

For example, if a problem involves adding pieces of fruit, children can first handle actual fruit. From there, they can progress to handling abstract counters or cubes which represent the fruit.

Pictorial step of CPA

Pictorial is the "seeing" stage. Here, visual representations of concrete objects are used to model problems. This stage encourages children to make a mental connection between the physical object they just handled and the abstract pictures, diagrams or models that represent the objects from the problem.

Building or drawing a model makes it easier for children to grasp difficult abstract concepts (for example, fractions). Simply put, it helps students visualise abstract problems and make them more accessible.

Abstract step of CPA

Abstract is the "symbolic" stage, where children use abstract symbols to model problems. Students will not progress to this stage until they have demonstrated that they have a solid understanding of the concrete and pictorial stages of the problem. The abstract stage involves the teacher introducing abstract concepts (for example, mathematical symbols). Children are introduced to the concept at a symbolic level, using only numbers, notation, and mathematical symbols (for example, +, –, x, /) to indicate addition, subtraction, multiplication or division.

White Rose Lesson Structure

A typical lesson will be structured as follows:

Retrieval and Chanting:

Children begin the lesson by practising knowledge and skills learned in previous maths lessons. Using the structure of yesterday, last week, last month and last year as a guide, the children are encouraged to make links to prior learning, reinforce knowledge and build schema.

I do, We do, You do (New learning)

In this part of the lesson the teacher models how to solve a problem similar to the ones the children will be facing in their workbooks (I do). A worked example (or two) will be left on display for the children to refer to. Then the class will explore similar problems in pairs or groups (We do). Finally, when the teacher has assessed that at least 90% of children can achieve this task, the class will complete questions independently (You do) in their White Rose workbooks. This cycle of the lesson will then be repeated (in shorter form) with applied / reasoning skills to ensure ALL children have access to greater depth knowledge. Teachers to plan in as many practice questions in this format as they deem needed to support deeper understanding.

Workbook:

Mastery challenges are available for children who have completed these tasks. In all years, children are introduced to new mathematical concepts using the CPA approach. Some children are able to move on to the pictoral and abstract stages but this varies between lessons. Therefore, additional paper or photographs of practical representations can be stuck in to their workbooks in order to show their preferred method. Children work with a partner to solve the problems in their books and discuss different methods that they could be using. Children challenge their partners if they don't agree and use mathematical language to discuss ideas.

Discussion of answers /marking and misconceptions:

Once the workbooks have been completed children mark their work together, discussing different methods and celebrating 'marvellous mistakes'.

Reasoning:

Reasoning is fundamental to knowing and doing mathematics. Children are taught to be systematic thinkers and articulate such thinking in clear, succinct and logical manner. It also involves being able to identify what is important and unimportant in solving a problem and to explain or justify a solution. Reasoning deepens children's understanding of mathematics and highlights any misconceptions they may have.

At the Cambridge Primary School, reasoning time is part of every lesson. Children will have opportunities to progress their reasoning skills from a novice reasoner to an expert reasoner through whole class, independent and guided reasoning sessions.