

## MATHS

"Mathematics is a creative and highly interconnected discipline...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." The National Curriculum 2014

## INTENT

At St Alphege Infant School, our aim is for all children to become confident mathematicians who are fluent in their mathematical approaches, can reason and problem-solve with confidence, and articulate their mathematical thinking. We believe that a deep understanding of key mathematical concepts is essential for our children's future progress. We aim to build a rich web of connected mathematical knowledge and understanding, underpinned by a **mastery approach** to the teaching and learning of mathematics.

### What are the principle beliefs of a 'mastery' approach to mathematics?

Mastery is a journey. Certain principles and features characterise and underpin the approach:

- High expectations and the belief that all pupils can achieve. Ability is neither fixed nor innate – it can be developed over time through practice, support, determination and hard work. This builds confidence and resilience to enable all to achieve, not just in maths but across the wider curriculum.
- A whole class approach so that **all** can access and master mathematical concepts.
- Adaptive teaching is achieved through highly skilled questioning and scaffolded levels of individual support and challenge.
- There is a focus on the development of deep mathematical understanding.
- There is a focus on the development of both factual/procedural and conceptual knowledge.
- There is an emphasis on breadth and depth – longer time is spent on key topics, providing opportunities to go deeper and embed learning.

Whilst there is no single definitive definition of 'mastery', we can say that a concept is deemed 'mastered' when learners can represent it in multiple ways, can communicate it using mathematical language and can independently apply the concept to new problems in unfamiliar situations.

## IMPLEMENTATION

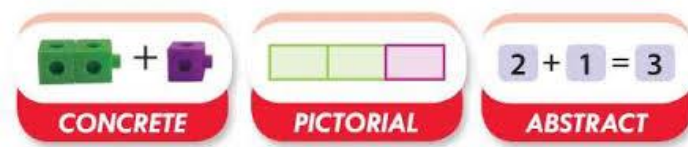
Maths lessons are interactive, practical and fun! Teachers reinforce an expectation that all children are capable of achieving high standards in Mathematics and the large majority of children progress through the curriculum content at the same pace. Adaptive teaching is achieved through a variety of different ways including levels of scaffolding with manipulatives, complexity of task design and questioning. This enables all children to achieve

their full potential. Teaching is underpinned by methodical curriculum design, and supported by carefully planned lessons and resources to foster deep conceptual and procedural knowledge.

To ensure whole school consistency and progression, Mathematical topics are taught in blocks, to enable the achievement of 'mastery' over time. There is an emphasis on number and the four operations, which underpins the mastery approach and forms the basis for deep conceptual understanding.

Photos, discussions and drawings capture learning and demonstrate children's next steps. As they progress through key stage 1, we continue to support learning practically, but also increasingly through structured written calculations. Teachers plan for coherent small steps of learning underpinned by clear representations to enable children to understand mathematical concepts and make connections in their learning. Teaching of Maths is supported by the Concrete, Pictorial, Abstract approach, using representation and variation to support mathematical learning.

### What is the Concrete Pictorial Abstract approach?



The CPA approach is a highly effective way of teaching that develops a deep and sustainable understanding of maths. Whenever a new mathematical concept is introduced, it is done so first through the use of concrete materials. These can be real objects or 'manipulatives' such as counters, Numicon or Dienes.



This will then progress to being represented by pictures and jottings, and then by a number sentence.

CPA Approach	
Stage	Characteristics
Concrete	Refers to the use actual objects or manipulatives that the child will handle.
Pictorial	Refers to the use of drawings or jottings that the child makes.
Abstract	Refers to abstract representations such as numbers that the child writes.

Alongside this, regular fluency practice is designed to support children to become fluent in key mathematical knowledge. Planning for opportunities for mathematical thinking means children are regularly discussing, justifying and making connections between their understanding, enabling them to confidently reason and problem solve. Another key element of the Maths National Curriculum is to enable children to explain the way they are thinking about Maths. This is called **mathematical reasoning**, and is a focus throughout the

school. Through this, we aim to develop children's higher order thinking skills, progressing from describing and explaining, to convincing, justifying and proving. To develop mathematical concepts and language, we model and encourage the use of full sentences when answering questions. Again, this has benefits far beyond Maths alone and can be used and applied across the whole curriculum.

## EYFS

Informed by research from the NCETM and using a range of resources, 6 key areas of early mathematical learning are covered in the EYFS. These are: **Cardinality and Counting, Comparison, Composition, Pattern, Shape and Space and Measure.**

Number fluency is continually developed within early years. Children participate in short maths sessions every day and are given time to explore mathematical concepts, test ideas, develop their understanding and practise taught skills through play. Maths can be found in all areas of our provision and children experience it in a purposeful and meaningful context within both play and daily routines. Our mud kitchen, construction areas, Forest School and domestic role play are just some of the areas in which children can explore number, shape, space and measures. Children are encouraged to use their mathematical understanding, language and skills to solve real-life problems and practitioners are trained to identify and extend opportunities to foster this and 'dig deeper'.

## IMPACT

Our rich and broad mathematics curriculum aims to embed enthusiasm for the study of mathematics and build an understanding of its importance in everyday life. Our teaching of mathematics will lead to at least good progress over time, relative to each individual child's starting point. It is designed to prepare children for their future.

As a result of our Maths teaching at St Alphege, you will see:

- Confident children who are developing their ability to talk about Maths and the connections between Mathematical topics.
- Engaging lessons that have a clear learning intention and which use a variety of resources to support learning.
- Diverse and rich representations of mathematical concepts.
- Teaching that makes connections and moves forward in small steps.
- Learning that is well planned, sequenced, tracked and monitored to ensure all children make good progress.