

# Halstow Primary School

## Guidance for Teaching & Learning of Maths



### **Intent**

As a school, we provide a wide range of opportunities for children to develop their fluency and master concepts through reasoning and application, ensuring that knowledge is interlocking. We firmly believe that high-quality discussion among pupils is paramount in developing children's logic, reasoning, and deduction skills, and underpins all mathematical learning. The ultimate goal is to develop mathematical understanding - comprehension of mathematical ideas and applications. We have created a culture of 'good mistakes' where children can openly discuss misconceptions to deepen their understanding.

Carefully planned learning sequences allow children to develop mathematical concepts and skills. Children are given opportunities to develop their fluency within sequences, as well as deepen their understanding through problem solving and reasoning. Our planning sequence ensures that teacher's explanations are linked with previous learning.

Our teachers are passionate about the role of discussion in generating enthusiasm and a spirit of inquiry in children. Our lessons include accessible learning for all with opportunities for children to apply and deepen their learning through reasoning in a range of contexts. We encourage collaborative learning and use questioning from pupils and teachers to deepen knowledge and understanding.

### **Aims for our pupils**

- To develop a growth mindset and positive attitude towards Mathematics
- To become confident and proficient with number, including fluency with mental calculations and making connections between numbers.
- To become problem solvers, who can reason, think logically, work systematically and apply their knowledge of Mathematics.
- To develop their use of mathematical language.
- To become independent learners and to work co-operatively with others.
- To appreciate real life contexts to learning Mathematics.

### **Implementation**

#### **Mastery Approach**

Halstow is a part of South East London Maths Hub and have two lead teachers taking part in the Teaching for Mastery Programme. Through continual professional development, teachers are being supported to plan and teach lessons that develop fluency and mathematical thinking in learners. Regular staff training and continual professional development (CPD) enables staff and leaders to keep their knowledge of the curriculum and mastery approaches up to date.



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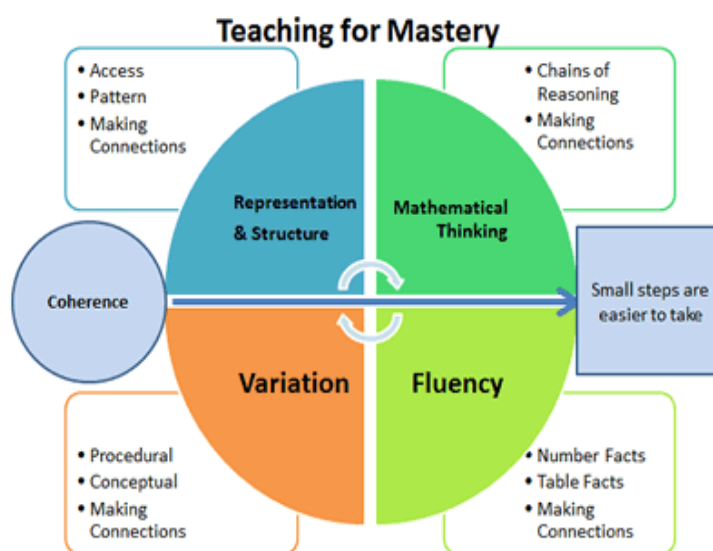
Our philosophy for teaching aligns with the NCETM Maths hub rationale for Mastery, which states:

- The expectation is that children move through the programmes of study at broadly the same pace
- Pupils who grasp concepts rapidly should be challenged through rich problem solving before any acceleration through new content.
- Those who are not sufficiently fluent through earlier material should consolidate their understanding, including through additional practise before moving on.

These key aims of the National Curriculum should be addressed in each sequence of learning:

- Fluency
- Reasoning
- Problem Solving

### Five Big Ideas of Mastery



Our teaching for mastery is underpinned by the NCETM's five Big Ideas:

- Opportunities for **Mathematical Thinking** allow children to make chains of reasoning connected with other areas of mathematics.
- A focus on **Representation and Structure** ensures concepts are explored using concrete, pictorial and abstract representations, the children actively look for patterns and generalise whilst problem solving.
- **Coherence** is achieved through the planning of small, connected steps to link every question and lesson within a topic.
- Teachers use both procedural and conceptual **Variation** within lessons,
- There is an emphasis on Fluency with a relentless focus on number and times table facts.

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### Principles of Teaching for Mastery

- **It is achievable for all** – we have high expectations and encourage a positive mindset in all pupils, creating learning experiences that develop children's resilience in the face of challenge.
- **Deep and sustainable learning** – lessons are designed with careful small steps.
- **The ability to build on something that has already been sufficiently mastered** – pupils' learning of concepts is seen a continuum across the school.
- **The ability to reason about a concept and make connections** - pupils are encouraged to make connections and spot patterns between concepts (ie ratio, division and fractions) and use **precise mathematical language** which frees up working memory and deepens conceptual understanding.
- **Conceptual and Procedural fluency** - children learn using objects, pictorial representations, and word problems in a range of contexts across the school.
- **Problem solving is central** in developing pupils' understanding of why something works so that they have a **deep understanding** rather than repeating routines without grasping the Mathematics.
- **Challenge through greater depth** - teachers set tasks to deepen knowledge and improve reasoning skills within the objectives of their year group.

### Planning and Resources

We use **White Rose Maths Progression** to develop a coherent and comprehensive conceptual pathway through the National Curriculum. This programme is aligned with the National Curriculum and links to the Ready To Progress NCETM assessment materials and visual resources. The focus is on the whole class progressing together. 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 White Rose Maths resources, NCETM Mastery materials, NRICH, visual images and concrete resources.



	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: Addition and Subtraction			Measurement: Length and Perimeter		Number: Multiplication and Division			
Spring	Number: Multiplication and Division		Measurement: Area	Number: Fractions				Number: Decimals		Consolidation		
Summer	Number: Decimals	Measurement: Money	Measurement: Time	Statistics	Geometry: Properties of Shape		Geometry: Position and Direction			Consolidation		

Overviews for each year group shows the small steps with supporting materials. Example above.

<https://whiterosemaths.com/for-parents/advice-and-guidance/>

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Teachers use Rosenshine's principles to give children the opportunity to review prior learning, ensuring knowledge is deep and embedded in their long-term memory. Teachers provide high quality modelling, which is seen on learning walls and during guided practise in lessons where we promote whole class mathematical discussions. In addition to guided practise, children are also required to work independently on an intelligent practise task to build confidence and allow teachers to assess individuals.

Opportunities for extra fluency practice (instant recall of key facts, such as number bonds, times tables, division facts, addition and subtraction facts) should be provided outside mathematics lessons. At home, children can use Times Table Rockstars to help their recall of times table facts.

### Lesson Structure

- Lessons are sharply focused.
- Key new learning points are identified explicitly.
- There is regular interchange between concrete/contextual ideas, pictorial representations and their abstract/symbolic representation.
- 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 (for example, in the form of whole class recitation, repeating to talk partners etc) 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.
- 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. They are addressed rapidly through individual or small group intervention, either on the same day or the next day, which may be separate from the main mathematics lesson, to ensure all pupils are ready for the next lesson.
- Teachers discuss their mathematics teaching regularly with colleagues, sharing teaching ideas and classroom experiences in detail and working together to improve their practice.

### SEND in Maths

Pupils with SEND may be supported by additional adults, varied resources, and/or a task that scaffolds and meets the needs of that child in their stage of the conceptual understanding of Mathematics. Where appropriate, children may complete additional or alternate Maths tasks linked to their personal learning targets.

### Early Maths


Our belief is that a mastery approach is crucial in early maths. In EYFS, we want children to develop a really strong sense of numbers within 10, which is aligned with the revised early years framework. This, in turn, will stand them in good stead as they move through the school. This includes understanding the link between numbers and quantity (representation of number), investigating how quantities are composed of smaller parts and ensuring numbers are explored in depth, rather than progressing to larger numbers.

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EYFS also follow the **White Rose Progression**, using NCETM support materials, which include the use of **Numberblocks** (created by NCETM and BBC) These short episodes have loveable characters with engaging story lines which gently introduce concepts of number to support early Mathematical understanding. The short clips have NCETM accompanying materials that break down the learning; teachers in **Reception and Year One** can use episodes as a launch pad to deepen children's conceptual understanding of number.

See an example of NCETM's overview of the learning in episodes linked to supporting materials:

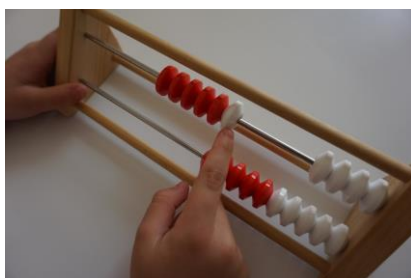


Episode	Name	Storyline	Mathematics
1	One	A little block falls out of the sky, meets her numberling and discovers one wonderful world, singing and counting to one.	<ul style="list-style-type: none"><li>• Meet <i>One</i></li><li>• Counting to 1</li></ul>
2	Another One	<i>One</i> discovers it's tricky to play tennis when you're the only block in the world. She bumps into a magic mirror and meets <i>Another One</i> – and they join forces to make <i>Two</i> .	<ul style="list-style-type: none"><li>• Meet <i>Two</i></li><li>• 2 is one more than 1</li></ul>
3	Two	<i>Two</i> finds a pair of magic dancing shoes and shows <i>One</i> that everything is better with 2, singing and counting things that belong in pairs.	<ul style="list-style-type: none"><li>• Counting to 2</li><li>• The 'twoness' of 2</li></ul>

<https://www.ncetm.org.uk/classroom-resources/ey-numberblocks-support-materials/>

### Mastering Number Programme

EYFS and KS1 are delighted to be taking part in the 'Mastering Number' programme run by NCETM Maths Hub. The programme is a systematic and structured scheme of work based in deepening the understanding of number and quantity. It builds on our innate ability to process quantities visually with graphics that expose mathematical structures. Staff in these year groups will receive training and take part in research groups throughout the year.



This programme brings focus to teaching early calculation that phonics programmes bring to teaching decoding. Over the year, children will use a range of materials and representations, including a small abacus-like piece of equipment called a rekenrek. This programme is underpinned by research into the mathematical development of young children.

*'Mathematics is not about numbers, equations, computations, or algorithms:  
it is about understanding.'*

— **William Paul Thurston**