

## Subject Story

### Maths

#### **Intent**

*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.*

At Morden Primary School, we believe mathematics is an important part of children's development throughout school. We believe that all children can succeed in maths and we aim to instil this belief in the children themselves. We want all children to enjoy mathematics and to experience success in the subject, instilling an 'I can' attitude to their learning.

We intend on delivering a curriculum which:

- Allows children to be a part of creative and engaging lessons that will give them a range of opportunities to EXPLORE mathematics following a mastery curriculum approach.
- Gives each pupil a chance to BELIEVE in themselves as mathematicians and develop the power of resilience and perseverance when faced with mathematical challenges.
- Recognises that mathematics underpins much of our daily lives and therefore is of paramount importance in order that children ASPIRE and become successful in the next stages of their learning.
- Makes rich connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems.
- Provides opportunities for children to apply their mathematical knowledge to other subjects (cross-curricular links).

## **Implementation**

At Morden Primary School, the principles of 'Teaching for Mastery' is used throughout the school. In EYFS, the Early Learning Goals will be met through the use of the NCETM Mastering Number planning documents, supported with the Power Maths and White Rose Schemes.

From Y1-Y6, statutory requirements of the National Curriculum (2014) are met through the use of the Power Maths Scheme of Learning, supported with the NCETM Curriculum Prioritisation in Primary Maths framework and White Rose. The Power Maths yearly and termly overviews provide the long-term and Medium-term plans, with adjusted small steps recorded on a paper planning format for each unit. The short-term planning is the 'Small Steps' lessons within each Unit, planned on PowerPoint. Teachers are encouraged to use professional discretion when deciding on how long to spend on a particular curriculum area whilst ensuring all objectives are covered by the end of the academic year.

These schemes of learning support a mastery approach to teaching and learning and have number at their heart. They ensure teachers stay in the required key stage and support the ideal of depth before breadth. They support pupils working together as a whole group and provide plenty of time to build reasoning and problem-solving elements into the curriculum. We see teaching for mastery in maths as allowing the pupils to gain a secure, long-term and deep understanding of maths.

These principles and features characterise this approach and convey how our curriculum is implemented:

- The large majority of children progress through the curriculum content at the same pace. Differentiation is achieved by emphasising deep knowledge and through individual support and intervention.
- Teaching is underpinned by methodical curriculum design and supported by carefully crafted lessons and resources to foster deep conceptual and procedural knowledge.
- Practise and consolidation play a central role. Carefully designed variation within this builds fluency and understanding of underlying mathematical concepts.
- Teachers use questioning in class to test conceptual and procedural knowledge and assess children regularly to identify those requiring intervention, so that children keep up.

At Morden Primary, we place high importance on mathematical talk. As a result, lessons include regular opportunities for the children to discuss their understanding and explain their thinking, both with the adults and their peers. Accurate use of vocabulary and terminology features prominently in our lessons, with teachers both modelling and expecting it from the children. We encourage children to answer questions in full sentences. Children are supported with this with the use of stem sentences. We believe this will support our children when faced with a range of mathematical problems.

Home learning for maths at Morden is task set by the teacher to consolidate previous learning using CGP home learning books. Additionally, children in Year 2 – 6 are to practise their times tables at home. We subscribe to 'Times Table Rock Stars' to give support with this expectation. NumBots is used in Early Years and KS1 to develop understanding, recall and fluency in mental addition and subtraction, so that they move from counting to calculating. In the Summer term Yr1 start to use TTRS.

### Impact

- Within the different strands of maths taught, children are showing a more secure understanding using the 'Teaching for Mastery' approach.
- Children show enthusiasm to learn their times tables. They love the challenge and competition of moving up levels and collecting coins on 'Times Table Rock stars' and being awarded with badges in assembly.

### EYFS, KS1 SATS, KS2 SATS Maths data

KS2 Results Attainment	2022 MPS %	2022 Nat %	KS1 Results Attainment	2022 MPS %	2022 Nat %	EYFS	2022 MPS %	2022 Nat %
Expected in Maths	67	79		38	76	Maths Exceeded		
Working in greater depth - Maths	7	27		21	22	Whole class APS	68 86	
KS2 Results Progress	2022 MPS	2022 Nat						
Maths	86			91				

### If you were to walk into Maths lessons at Morden, you would typically see:

- The majority of our pupils progress through the curriculum content at the same pace. Differentiation is achieved by emphasising deep knowledge and through individual support with pre-teaching and rapid intervention.
- Practice and consolidation play a central role. Carefully designed conceptual and procedural variation in the Power Maths and supporting schemes resources builds fluency and understanding of underlying mathematical concepts in tandem.
- Teachers use precise questioning in class to test conceptual and procedural knowledge, and assess pupils regularly to identify those requiring intervention so that pupils keep up.
- Teachers will use the concrete, pictorial and abstract approach (CPA) to ensure that procedural and conceptual understanding are developed simultaneously.
- Emphasis placed on 'learning' through reasoning, developing multiple strategies and concepts towards understanding.
- Challenge for pupils grasping concepts quickly is provided through depth and breadth of experience.
- Daily opportunities to reason and problem solve.

The school's participation in the DFE funded Maths Hubs programme continues to ensure that staff at all levels understand the pedagogy of the approach.

New concepts are shared within the context of an initial related problem, which children are able to discuss with partners. This initial problem-solving activity prompts discussion and reasoning, as well as promoting an awareness of maths in relatable real-life contexts that link to other areas of learning. In Early Years and KS1, these problems are presented with objects (concrete manipulatives) for children to use. Children also use manipulatives in KS2 to develop a good understanding of the maths being taught. Teachers use careful questions to draw out children's discussions and their reasoning. The class teacher then leads children through strategies for solving the problem, including those already discussed. Independent practice provides the means for all children to develop their fluency further, before progressing to more complex related problems. Mathematical topics are taught in blocks, to enable the achievement of 'mastery' over time. Each lesson phase provides the means to achieve greater depth, with higher ability children having access to sophisticated problems, as well as exploratory, investigative tasks, within the lesson as appropriate.

## **Pupil Voice**

### ***What have you been learning this term? (February 2022)***

Y1 – counting and adding numbers up to 50. We use plus and minus.

Y2 – Times tables x2, x5 x10

Y6 – multiplying decimals and long division

Y4 – multiplying a 2-digit number by a 1-digit number. We have to estimate the answer first and explain our methods.

Y5 – Fractions – improper and mixed number fractions.

### ***What do you enjoy about Maths?***

Y6 – I like work on angles when you have to find the missing angle. I enjoy fractions. I like using DMSBR to help me with long division.

Y5 – I enjoy multiplying.

Y4 – I enjoy learning alternative methods and then I choose the one I like best. I enjoy the maths fluency every day.

Y3 – Maths is like playtime because it is so much fun.

Y2 – I enjoy doing challenges. You need to think hard with your brain to work them out.

Y2 – Times tables – I want to get all my times table badges.

Y1 – Number bingo

### ***What/who helps you in your Maths lesson?***

Y6 – Partners. I find the 'maths working wall' helpful to remind me what I need to do.

Y5 – Using times table flash cards.

Y5 – Maths working wall examples. The teacher, but now I can do it by myself or with my partner.

Y4 – 100 square, PV slider to x10 and x100, teacher and partners, maths working wall,

Y4 – Bar models help me solve the problems.

Y3 – Working with my maths buddy.

Y2 – We use place value counters for adding and subtracting. Dienes, double-sided counters, part-wholes, pictures.

Y1 – The teacher explains it to us. We have a maths resource bag with counters, tens frames, part-whole, dienes tens and ones.

**How do you know how well you are doing?**

Y1 – I get the answers right. We get a sticker. Teachers says 'good job'.

Y2 – Teacher marks my work and if it is pink, I know I have done good.

Y6 – Teachers marks and comments. Purple pen marking at the end of the lesson. We are able to complete the challenge.

Y4 – We get team points. We mark in class and the teachers goes through questions if we get them wrong. We get on to the challenge.

Y5 – I get lots of ticks. We get feedback 'I like how you used this method – well done'. You get to the dive deep and challenge.

**What do you do to improve your work/learning?**

Y4 – Complete my home learning and do extra maths.

Y2 – push my hardest. Think some more.

Y6 – concentrate in class. Work more at home and show the teacher.

Y5 – I concentrate and listen. I listen when marking.

**An example of skills and knowledge progression within our Maths curriculum**

**Understanding the Number System**

Place value						
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<b>Place value: Count</b>	<ul style="list-style-type: none"> <li>count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number</li> <li>Count numbers to 100 in numerals; count in multiples of twos, fives and tens</li> </ul>	<ul style="list-style-type: none"> <li>count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward</li> </ul>	<ul style="list-style-type: none"> <li>count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number</li> </ul>	<ul style="list-style-type: none"> <li>count in multiples of 6, 7, 9, 25 and 1000</li> <li>count backwards through zero to include negative numbers</li> </ul>	<ul style="list-style-type: none"> <li>count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000</li> <li>count forwards and backwards with positive and negative whole numbers, including through zero</li> </ul>	
<b>Place value: Represent</b>	<ul style="list-style-type: none"> <li>identify and represent numbers using objects and pictorial representations</li> <li>read and write numbers to 100 in numerals</li> <li>read and write numbers from 1 to 20 in numerals and words</li> </ul>	<ul style="list-style-type: none"> <li>read and write numbers to at least 100 in numerals and in words</li> <li>identify, represent and estimate numbers using different representations, including the number line</li> </ul>	<ul style="list-style-type: none"> <li>identify, represent and estimate numbers using different representations</li> <li>read and write numbers up to 1000 in numerals and in words</li> </ul>	<ul style="list-style-type: none"> <li>identify, represent and estimate numbers using different representations</li> <li>read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of zero and place value</li> </ul>	<ul style="list-style-type: none"> <li>read, write, (order and compare) numbers to at least 1 000 000 and determine the value of each digit</li> <li>read Roman numerals to 1000 [M] and recognise years written in Roman numerals</li> </ul>	<ul style="list-style-type: none"> <li>read, write, (order and compare) numbers up to 10 000 000 and determine the value of each digit</li> </ul>
<b>Place value: Use and compare</b>	<ul style="list-style-type: none"> <li>given a number, identify one more and one less</li> </ul>	<ul style="list-style-type: none"> <li>recognise the place value of each digit in a two-digit number (tens, ones)</li> <li>compare and order numbers from 0 up to 100; use &lt;, &gt; and = signs</li> </ul>	<ul style="list-style-type: none"> <li>recognise the place value of each digit in a three-digit number (hundreds, tens, ones)</li> <li>compare and order numbers up to 1000</li> </ul>	<ul style="list-style-type: none"> <li>find 1000 more or less than a given number</li> <li>recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones)</li> <li>order and compare numbers beyond 1000</li> </ul>	<ul style="list-style-type: none"> <li>(read, write) order and compare numbers to at least 1 000 000 and determine the value of each digit</li> </ul>	<ul style="list-style-type: none"> <li>(read, write), order and compare numbers up to 10 000 000 and determine the value of each digit</li> </ul>
<b>Place value: Problems/Rounding</b>		<ul style="list-style-type: none"> <li>use place value and number facts to solve problems</li> </ul>	<ul style="list-style-type: none"> <li>solve number problems and practical problems involving these ideas</li> </ul>	<ul style="list-style-type: none"> <li>round any number to the nearest 10, 100 or 1000</li> <li>solve number and practical problems that involve all of the above and with increasingly large positive numbers</li> </ul>	<ul style="list-style-type: none"> <li>interpret negative numbers in context</li> <li>round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000</li> <li>solve number problems and practical</li> </ul>	<ul style="list-style-type: none"> <li>round any whole number to a required degree of accuracy</li> <li>use negative numbers in context, and calculate intervals across zero</li> <li>solve number and</li> </ul>



## Examples of learning



Place value



Division



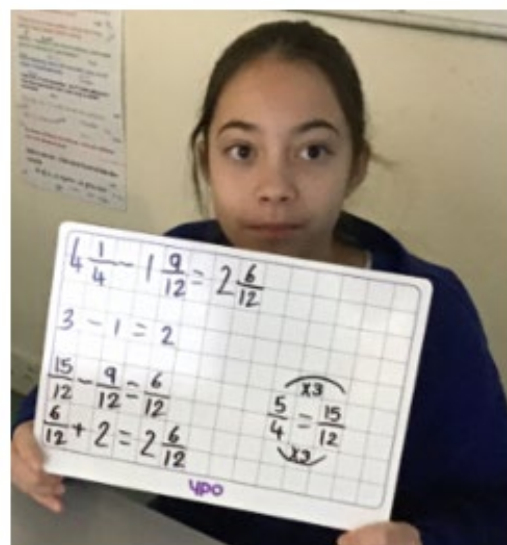
Place value



Measuring angles



Measuring perimeter



Fractions

## Successes in 2021-2022

### Identify:

- Rollout of the 'Teaching for Mastery' approach across the school.

### Develop:

- 'Teaching for Mastery' approach used across the school.
- Increased number of children achieving their times table badges.
- RTP criteria used by KS1 and KS2
- NTS assessment used alongside teacher assessment/PI grids to assess children's attainment.

### Embed:

- Time table badges given out weekly in celebration assemblies.
- Integration of new high-quality resources to support 'teaching for mastery'

## Priorities for 2022 - 2023

### Develop:

- Maths progression to be mapped out to correspond to updated Power Maths curriculum.
- Update calculation policy to correspond with updated Power Maths curriculum.  
([Calculation policies handed out in staff meeting](#))

### Embed:

- Children completing and submitting x1 written maths home-learning a week.
- Children using TTRS at least 30mins a week.
- Small steps unit overviews show carefully planned sequences of learning with adjustments to suit the needs of individual classes. Lesson date corresponds to dated work in exercise books.
- PI grids match Sims data
- Daily fluency sessions to include times tables in year 2 -6
- Monitoring will show that Maths lessons match lesson plans, which match progression documents.
- Non-negotiables outlined above (*If you were to walk into a Maths lesson ...*) are evident in lessons.

## Priorities beyond 2023

### Establish:

- The majority of pupils will be able to access the maths curriculum at ARE with improved maths fluency and number sense
- Pupils will show a positive attitude to maths and are aware of their successes
- Pupils with SEND and disadvantaged pupils will benefit from explicit, systematic rehearsal of declarative and procedural knowledge approach to teaching.

<b>Morden subscription websites</b>
<a href="https://www.mathletics.com/uk/">https://www.mathletics.com/uk/</a>
<a href="https://mathseeds.co.uk/">https://mathseeds.co.uk/</a>
<a href="https://play.ttrockstars.com/">https://play.ttrockstars.com/</a>

**Some other websites you might find particularly interesting**

<https://www.mathsisfun.com/>

<https://www.theschoolrun.com/maths>

<https://www.bbc.co.uk/bitesize/subjects/z826n39>

<https://www.bbc.co.uk/bitesize/subjects/zjxhfg8>

[I Love Maths Games - Games](#)

<https://trockstars.com/>

<https://www.topmarks.co.uk/maths-games/hit-the-button>

<https://mathszone.co.uk/>