



## Maths

### Intent

At Mendlesham Primary School we aim for children to competently use maths in every-day life. To be able to think mathematically, creatively, logically and ultimately think in abstract ways that has benefits beyond maths to ensure they have the best chance of being successful in Maths in their future.

We deliver the key aims of the National Curriculum providing children with the opportunities to problem solve, reason and enhance their mathematical fluency by developing depth of conceptual understanding through use of Contract, Pictorial and Abstract (CPA) approach. Ensuring our classrooms have a culture of enquiry, experiment and embracing mistakes as a way of deepening understanding. Within our classrooms we allow children to develop their thinking and logic, and to work independently and flexibly, to discover pattern and relationships. Speaking and listening is valued within maths and we ensure correct terminology is taught and used across the whole school. Children progress through the curriculum and interventions are put in place early on to minimise any gaps in the children's knowledge and understanding.

Maths provides children with the opportunity to develop:

- Independence
- Critical thinking
- Resilience
- Risk taking

**The aim is for children to:**

- Competently use maths in every-day life.
- To think mathematically, creatively, logically and ultimately think in abstract ways that has benefit beyond maths.
- Have the best chance of being successful in Maths at Secondary and Higher Education.

To deliver the key aims of the National Curriculum: Problem Solving, Reasoning and Fluency by:

- Ensuring our planning provides opportunities for the above
- Maintaining a strong focus on place value, number and calculation
- Developing depth of understanding (mastery) through use of CPA approach
- Promoting a culture of enquiry, experiment and a culture of embracing mistakes as a way of deepening understanding. Allowing space for children to develop their thinking and logic, and to work independently and flexibly, to discover pattern and relationships
- Valuing speaking in maths and not compromising on the use of the correct terminology
- Ensuring children progress through the curriculum without gaps appearing in their understanding.
- Intervention to be put in place early to minimise the gaps appearing and/or growing.

*This approach should support driving enjoyment of maths.*

## Implementation

Each lesson should provide the following learning opportunities:

**7 part lesson plan** (based on Craig Barton's I do, We do, You do - considering timings for guidance).

<b>3 – 5 mins</b>	<b>Warm up</b> – always involving counting (1s, times tables, odd/even, decimals, fractions or using vocabulary e.g. describing shapes – vertices etc)
<b>2 – 3 mins</b>	<b>Review/recap previous lessons</b> , including language/terminology
<b>1 – 2 mins</b>	<b>FAST FACT</b> – recap/introduce (2 – 3 per week) repeat throughout day/week/lesson/subsequent lessons  e.g. $10/10 = 1$ or a right angle has 90 degrees (Ensure always full sentences)
<b>10-15 min</b> <b>I do</b>	<b>Teach new concept/next steps – use of concrete or examples of using abstract.</b>
<b>6 – 8 mins</b> <b>We do</b>	<b>Practical reasoning/talk partners</b> – with whiteboards and equipment at desks. Short sharp bursts, stop frequently getting children to explain their reasoning while others listen. Ensure always use whole sentences when explaining e.g. – What do those red counters represent? Answer - Those counters represent the cars in the car park.
<b>20 – 25 mins</b> <b>You do</b>	<p><b>Independent Work</b></p> <div style="display: flex; align-items: center;"> <div style="margin-right: 20px;">Main Task</div> <div> <p>Working towards standard – with support/scaffolding</p> <p>Working at standard – independent or a little support to begin</p> <p>Working beyond / greater depth – begin main task but as soon as secure move on to:  <b>Challenge/explaining/verbalising/writing reasoning response – the why or how do you know in a speech bubble</b></p> </div> </div> <p>Through live marking identify misconceptions and pupils requiring additional support or those able to move on  <b>NOTE: Pupils with SEN may require further scaffolding, support or individualised task</b></p>
<b>10 mins</b>	<p><b>Plenary</b></p> <p>Self-Assessment</p> <p>Additional teaching to overcome misconceptions</p> <p>Additional challenge to work through together as a class</p> <p>Introduce next steps ready for learning tomorrow</p>

- **Objectives** - shared with children at the beginning or sometimes later in the lesson
- **Warm Up** - this may well not be directly linked to the main lesson. It can be used to reinforce previous lessons; to further assess degrees of fluency; to drive fluency; or to give a rich opportunity for reasoning: Odd One Out; What's the same? What's different? "Always, Sometimes, Never" true; What number of children in the class would the teacher prefer? 23 or 24?; Finding multiples of 4 on the board – how can I work this out with the bigger numbers? Three in Three or Five in Five (as in White Rose or PiXL), Craig Barton style diagnostics (multiple choice questions).
- **Review** - this is likely to be linked to the main lesson and *may* be very short e.g. finding the multiples of 4 on the board, counting up in 4s... but gives the opportunity to check whether the children have a building block necessary for the main lesson, to address misconceptions identified from a previous lesson or to consolidate previous learning before they move on.
- **Fast fact** - this is likely to be a key fact that they need to know for the main lesson.
- **Main Lesson** - new learning for the day – clear use of CPA (across all year groups).
  - Teach new concept
  - Practical reasoning/talk partners
  - Independent work
- **Plenary** - this may occur at any point during the main lesson e.g. addressing a common misconception.

Other things that should be considered

- **Word of the Day** if there is a key piece of vocabulary being used in the main lesson, ensure this is taught explicitly e.g. multiple, produce, factor

- **Misconception** - ensure the misunderstandings happen in the lesson by ensuring the verbal or written questions expose them. e.g. If adding hundredths, then a child is likely to get  $4.53 + 2.35$  correct but might make errors with  $4.5 + 2.35$  by adding tenths to hundredths.
- **Problem solving, Reasoning and Fluency** - you won't necessarily see all three of these in every lesson. As the block develops, you will want to ensure that all these elements have been planned for. The balance of these may vary from day to day, and even from week to week and block to block.

## CPA

Concrete equipment available includes, but is not limited to:

- 10 base / Dienes
- Numicon
- Multi-link cubes
- Cuisenaire rods
- Bead strings
- Straws, counters (single colour and two colour),

The pictorial stage is the most likely one to be missed but is the most useful as can be drawn on when concrete equipment is not available. e.g. bar models in particular are good in problem solving. Concrete can also be used to 'prove' abstract or pictorial. NB: number lines are at the more abstract end of pictorial.

Long and Medium Term planning is underpinned by White Rose, which secures progression of skills and knowledge. Continuous formative and summative assessment (PUMA/PiXL) ensures that units are adapted to suit the specific needs of each cohort, either consolidating or extending where necessary.

## Times tables

Recognising multiples in numbers and building up blocks in multiplication and division is greatly aided by instant recognition or recall. Our policy is therefore to learn them

- Start with counting up in multiples of a number
- Learn times tables but also have strategies for working one out if unable to recall e.g.  $10 \times 7 = 70$  so  $9 \times 7 = 70 - 7$
- Learn to 12 x

- Key that children recognise multiples in numbers e.g. 210 is a multiple of 3 and 7 because  $3 \times 7 = 21$
- Learn in this order with guide for year group, encouraging mathematical connections, patterns and relationships. Challenging with use of decimals and multiples of 10

R	Counting in 2s
1	count up in 2s, 10s and 5s
2	2x, 10x 5x
3	3x, 4x, 8x
4	6x, 7x , 9x, 11x, 12x
5	Revisit
6	Revisit

### Calculation Guidelines

Please see the calculation policies for progression of skills – this is taught at the children's need/ability not necessarily based on age/year group.

### Impact

### Assessment

Pupil voice is utilised to understand pupils' view of their maths teaching and learning. It should indicate that they enjoy learning maths and understand that maths skills are useful to them. Pupils should report that teacher's feedback in lessons (live marking) is useful and helps them to correct errors and misconceptions. Maths learning also supports pupils' learning in the wider curriculum including Geography, Science and DT.

PUMA and PiXL standardised assessments are used from year 1 to 6 termly. These provide teachers with a question level analysis that can inform future teaching and learning needs. Weekly assessments of the basics should be carried out i.e. number bonds, times tables. This should be monitored and recorded to be able to provide the Maths Lead with an update.

Times Table Rock Stars is used as an assessment tool for times tables knowledge as well as weekly in class assessments. Children are encouraged to regularly use this in preparation for the Year 4 times table test.

Children write within their books as much as possible and can explain their learning, including where they may have gone wrong and how they learned from that.

### **Long Term Plan**

Long term plans are designed to give guidance for the allocation of time to each area of maths. Place Value and Calculation are earlier in the year allowing these to be revisited and consolidated both through “Early morning work”, and through the Maths lesson’s “Warm ups” and in “Reviews” where it leads into the main lesson - for example, using and applying calculation in contexts of length, perimeter, mass, money etc.

As it is guidance, this is to be used flexibly. For example, spending longer on a unit if concepts require further understanding or moving around the units / splitting them e.g. 2 weeks of shape, could be split into 2 and use to break up a long stretch of calculation. **However, a record is kept in conjunction with the maths lead as to what has or has not been covered in any one year of teaching.**

The allocation of time slots has been drawn from White Rose Maths. The schemes list of objectives provides lots of guidance and imagery that can be copied and used to develop fluency within your own resources.

The curriculum for each term is planned across 12 week terms. This allows for:

- Assessment/Test Week
- Deep learning weeks
- Further consolidation