Mendlesham Primary School

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, and 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. We encourage a culture of embracing mistakes as a way of deepening understanding and that learning isn't always easy. 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 learning is built up through revisiting.

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 problem solving, reasoning and fluency.
- Maintaining a strong focus on place value, number and calculation.
- Developing depth of understanding (mastery) through use of CPA approach.
- Promoting a culture 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.

This approach should support driving enjoyment of maths.

Implementation

Each lesson should provide the following learning opportunities using (most of the time) the 7-part lesson plan.

Timing	
3 – 5 mins	**Embedding** Practise previous learning to embed. Gradually, the time between these revisits can get longer. It may be that this part of the lesson will have no direct connection to the new learning of the day. Assess to see whether learning has been embedded in order to judge when you need to further practise this knowledge or process, and decide what next steps are. This is likely to be a slide with questions – it may well be differentiated to ensure access and success for all, and enables you to see next steps. Or it may be an activity on their tables or questions on a worksheet. If some LA are unsure (eg can't remember how % work), can do one of the questions to get them going. Put up the answers quickly – only pause on one if can quickly draw out some depth of learning.
1 – 2 mins	**FAST FACT** This may or may not directly connect to today's new learning: • a revisiting of vocabulary – eg A polygon is …… • filling in a word in a stem sentence eg To find the area of a rectangle, …….. the base by the height. • times table facts 2 x 4 = 4 x 4 = 8 x 4 = • derived facts 3 x 4 = 3 x 40 = 3 x 400 = • etc The children need to not be passive receivers of a fact, but actively need to think and usually write a response. You might repeat a fast fact during the week, or evolve one through the week.
2 - 3 mins	**Review or recap**

	This should be a recap of previous learning (perhaps from the day before) that is a step, or support, for the new learning of the day. Eg If learning is Area, practise multiplication. Eg If learning is multiplying 2 digit by 2 digit, practise multiplying by 1 digit This may have a bearing on the lesson for that day, from a tweak to a complete change of plan! Put up the answers quickly unless there are questions that need to be more carefully considered because it links with the new learning of the day or because they have proved tricky.
15 - 20	**Teach new concept/next steps – use of concrete or examples of using abstract.** **Vocab and Stem sentences** • Is there a key word or phrase you need to explicitly teach today – eg product, array, multiple, mean • What does this mean in everyday language? What does it mean in maths context? • Choose vocabulary based on what the pupil and teacher need to be able to use to communicate effectively. • Is there any other vocabulary that should be already known? Check prior learning. Think about the concept for that day. Which is the best way to model this concept? Are you going to use White Rose Slides, or use your own input? Will this involve Concrete or Pictorial? What stem sentence are you going to use? Eg To find the area of a parallelogram, multiply the base by the **perpendicular** height. **<u>The new learning might look like:</u>** • **Process** ○ My go – if process then let them watch. Then repeat and talk it through. ○ Do another one, let them watch. Talk it through ○ New question, but very similar. Their go. Can help each other in learning partners. ○ New question, again quite similar – have only a slight variation each time. ○ Repeat until most of the class at least are secure.

	• **Teacher shows or demonstrates new idea or concept.**
	  ○ Teachers uses concrete, pictorial (eg white board or on table), or uses White Rose or own slides.
	  ○ Use slides to provide opportunities to practise.
	  ○ Ensure the slides progress the practice so a nano-step each time (White Rose sometimes jumps around).
	  ○ What misconceptions might come up – are you going to tackle these in your input, or just ensure they are in the independent work.
	
	• **New concept demonstrated. Can we now prove this with our concrete or pictorial?**
	  Eg show subtraction on the board with a number line, and then prove with Dienes (each child or in pairs).
	
	• **Show me**
	  ○ Show me – pupils individually show/demonstrate with concrete or pictorial eg Show me 2x3 with cubes/counters/straws
	  ○ Build with a next step.
	  ○ Ask questions to explore our understanding.
	  ○ So how would we work out….So if we know that, we know this……
	
	• **Use of stem sentence and use and apply in a range of circumstances.**
	  Eg If the UK is the whole, then …….. is part of the whole (with a map of England, Wales, Northern Ireland and Scotland to choose from).

20 – 25 mins	**Independent Work** Main Task LAPs – with support/scaffolding MAPs – independent or a little support to begin HAPs – begin main task but ensure there is sufficient opportunity to be challenged All children should be encouraged to explain and reason. Problem solving should be for ALL children – not just as the interesting maths to do once you've learnt concept and process. **NOTE: SEN may require different task altogether. You should always ask if their start point for this strand for maths been catered for.**
3 -5 mins	**Plenary** Self-assessment – tool kit; complete face to show how they feel about their learning; if no written work, use thumbs up or down against learning objective. If a simple error or misconception has come up in the lesson, then address it if you've not already done so. More complex misconceptions will need to be addressed in further lessons.

CPA

Concrete equipment available includes, but is not limited to:

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

CPA should not be seen as a linear process ie concrete, then pictorial and then move to abstract – concrete and pictorial should be used as appropriate to support learning. 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 x 7 = 70 so 9 x 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 x 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 report that teacher's feedback in lessons (live marking) is useful and helps them to correct errors and misconceptions and that revisiting regularly helps them to remember. 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 5 termly, and Year 6 more frequently (Pixl use old SATs papers). These provide teachers with a question level analysis that can inform future teaching and learning needs.

Stick and Split and Times Table Rock Stars are used for children to learn their times tables.

Children write within their books as much as possible and can explain their learning, including where they may have gone wrong and how they learnt 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/Embedding Learning” and in “Reviews/recaps” 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 test weeks.