Mathematics

At Lathom Junior School, we aim to ensure our children have access to a high-quality maths curriculum that is both challenging and enjoyable by providing our learners with a variety of mathematical opportunities to enable them to make connections between mathematical ideas, between mathematics and other subjects, and between mathematics and everyday life.
At Lathom Junior School, teaching and learning aims to develop children to become confident mathematicians who are not afraid to take risks. We want our children to develop as independent learners with inquisitive minds, who have secure mathematical foundations and who enjoy maths and see its relevance in their everyday lives.
Our aim is that all children will have:

- A deep understanding of mathematical concepts.
- Confidence and competence so that they are proud of their achievements.
- The ability to work both collaboratively and independently to discuss ideas, strategies and solutions to mathematical problems using a wide range of mathematical language.
- Resilience and a positive growth mind set so that they are equipped to be challenged, learn from their mistakes and to solve increasingly sophisticated problems in a wide range of contexts.
- Rich mathematical experiences where they have applied knowledge to puzzles, problems and everyday life.
- The ability to apply and use maths in the wider curriculum.
- Enthusiasm, curiosity and fascination about maths itself.

The Curriculum – what do children learn?

Teaching and learning in lower key stage 2 ensures that children become increasingly fluent with whole numbers and the four operations, including number facts and the concept of place value. Children develop efficient written and mental methods and perform calculations accurately with increasingly large whole numbers. At this stage, children develop their ability to solve a range of problems, including with simple fractions and decimal place value. The bar model is used to represent these problems visually to support the understanding of the problem before calculating.
Children draw pictorial representations and mathematical drawings with increasing accuracy and develop mathematical reasoning to analyse shapes and their properties, describing the relationships between them. Children use measuring instruments with increasing accuracy and make connections between measure and number.

Teaching and learning in upper key stage 2 provide opportunities for children to extend their understanding of the number system and place value to include larger integers.

Children make connections between multiplication and division with fractions, decimals, percentages, and ratio. At this stage, children develop their ability to solve a wider range of problems, including increasingly complex properties of numbers and arithmetic, and problems demanding efficient written and mental methods of calculation. The bar model is used to represent these problems visually to support the understanding of the problem before calculating. In year 6, children are introduced to the language of algebra as a means for solving a variety of problems. Teaching in geometry and measures consolidates and extends knowledge developed in number; children classify shapes with increasingly complex geometric properties and use mathematical vocabulary to describe them.

The Curriculum – how is it organised?

At Lathom, the skills and concepts to be taught as stated in the National Curriculum have been plotted on our Maths Progression Document for each area or focus in maths to ensure concepts are delivered at the appropriate stage and in a progressive way, building on prior knowledge and skills in KS2 and to avoid 'gaps' in understanding.

Example Maths Progression Document: Place Value and Number

	Year 3	Year 4	Year 5	Year 6
Number and Place Value	**Pupils should be taught to:** · count from 0 in multiples of 4, 8, 50 and 100; finding 10 or 100 more than a given number · recognise the place value of each digit in a three-digit number (hundreds, tens, ones) · compare and order numbers up to 1000 · identify, represent and estimate numbers using different representations including measure · read and write numbers to at least 1000 in numerals. · read and write numbers to at least 1000 in words. · solve number problems and practical problems involving these ideas	**Pupils should be taught to:** · count in multiples of 6, 7, 9, 25 and 100 · find 1000 more or less than a given number · count backwards through zero to include negative numbers · recognise the place value of each digit in a four-digit number (thousands, hundreds, tens and ones) · order and compare numbers beyond 1000 · identify, represent and estimate numbers using different representations · round any number to the nearest 10, 100 or 1000 · solve number and practical problems that involve all of the above and with increasingly large positive numbers · read Roman numerals to 100 (I to C) and understand how, over time, the numeral system changed to include the concept of zero and place value	**Pupils should be taught to:** · read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit · count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000 · interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers including through zero · round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000 · solve number problems and practical problems that involve ordering and comparing numbers up to 1,000,000, counting forwards or backwards in steps, interpreting negative numbers and rounding. · read Roman numerals to 1000 (M) and recognise years written in Roman numerals	**Pupils should be taught to:** · read, write, order and compare numbers up to 10 000 000 and determine the value of each digit · round any whole number to a required degree of accuracy · use negative numbers in context, and calculate intervals across zero · solve number problems and practical problems that involve ordering and comparing numbers up to 10,000,000, rounding to a required degree of accuracy, using negative numbers and calculating across zero. · demonstrate an understanding of place value including decimals e.g 28.13 = 28 + 0 + 0.03

From the maths progression document, the units of work are plotted over the different terms within the academic year with the amount of time for each unit plotted as a guide.

Example Long Term Overview Year 3

	Wk 1	Wk 2	Wk 3	Wk 4	Wk 5	Wk 6	Wk 7	Wk 8	Wk 9	Wk 10	Wk 11	Wk 12
Autumn	Number: Place Value			Number: Addition and Subtraction					Number: Multiplication and Division			
Spring	Number: Multiplication and Division			Measurement: Length and Perimeter			Number: Fractions			Measurement: Mass and Capacity		
Summer	Number: Fractions			Measurement: Money		Measurement: Time			Geometry: Property of Shape	Statistics		Consolidate

Medium Term overviews: Example Year 3: Number: Place Value

For each unit in maths, a medium-term overview with learning objectives to be covered has been plotted over the number of designated weeks taken from the long term overview as a guide.

Number: Place Value (3 week unit: 12 lessons)	
Week 1	- Counting in 100s, 10s and 1s - Understanding hundreds: one hundred as ten tens and one hundred ones - Recognising the place value of each digit - Zero as a place holder - Identifying and estimating numbers on a number line
Week 2	- Representing numbers to 1000 in different ways - Partitioning numbers to 1000 - Flexible partitioning - numbers to 1,000 - Hundreds, tens and ones: using PV counters and PV charts - Finding 1, 10, 100 more or less than a given number
Week 3	- Number lines to 1000 - Estimating the position of numbers on number lines - Comparing numbers to 1,000 - Ordering numbers to 1,000 - Counting in 50s

How are weekly lessons taught?

Maths lessons at Lathom are designed to enable children to work on the similar tasks and engage in common discussions; children have opportunities to explore concepts together and are supported to understand mathematical relationships and mathematical connectivity through teacher modelling and paired practise. Differentiated questioning during lessons support children to develop fluency and think about the underpinning mathematical concepts. Differentiation occurs in the *support* and *intervention* provided to children with challenge planned through more demanding problems which deepen knowledge of the same content in a reasoning and problem-solving context as part of independent tasks. Teachers use formative assessment through 'live' feedback to identify difficulties and misconceptions which can be addressed within the week's learning sequence as part of starter activities.

Lessons are structured in the following way to enable children to revisit aspects of prior learning as well as being introduced to new concepts and strategies and to have opportunities to work collaboratively and independently:

- At the start of the lesson, children revisit, practise and rehearse number facts and taught mental strategies followed by an open-ended question or problem that revisits an aspect of prior learning from a previous lesson or unit of work.

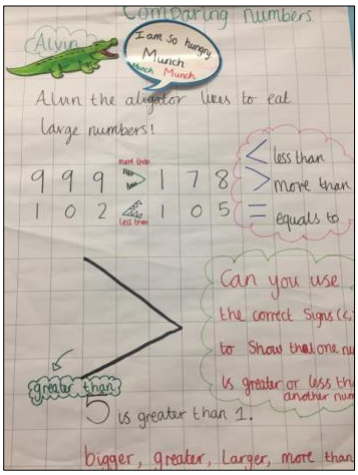
- Children are then guided in their learning by the teacher who introduces the new concept, method or strategy. In this part of the lesson, children are exposed to *different* examples of the *same* concept.

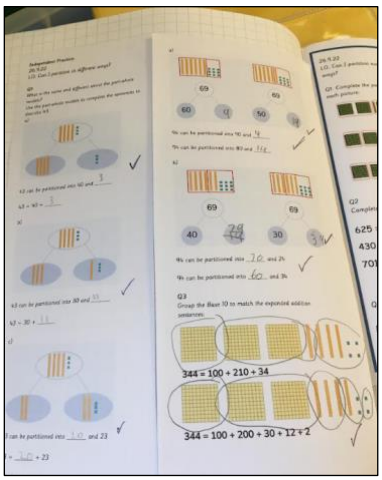
- In the next part of the lesson, the teacher decides whether children need further practise of the taught concept or strategy or if they are now ready to answer fluency, reasoning and problem-solving type questions**.**

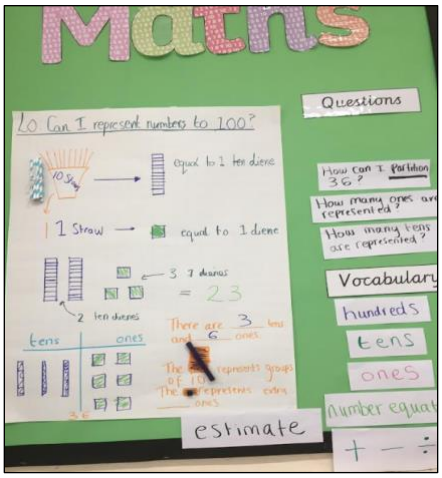
- In last part of the lesson, learning is recapped, reflected on and summarised.

At Lathom, we use a CPA (Concrete – Pictorial – Abstract) approach to support teaching and learning of mathematical concepts and ideas. However, because maths is an abstract subject, children are supported to move onto abstract methods as soon as they are ready to do so.
As children move through the key stage, there will be increasingly less or little need for the use of concrete materials for the *majority* of learners. However, in any one class, individual children or groups of children will be at a different point in their learning journey; some children may need further practise using concrete materials, other children will be recording using formal abstract methods.
Across Key Stage 2, children are encouraged to show their working out and methods using jottings to support mathematical thinking and reasoning.

Year 3







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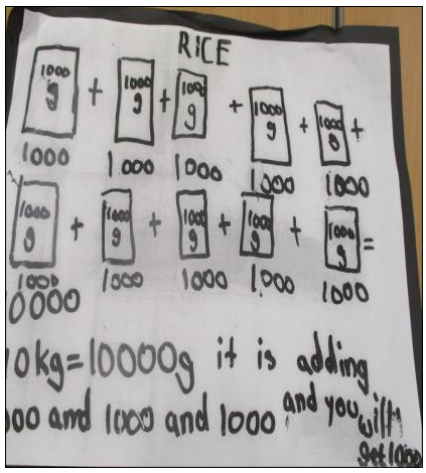

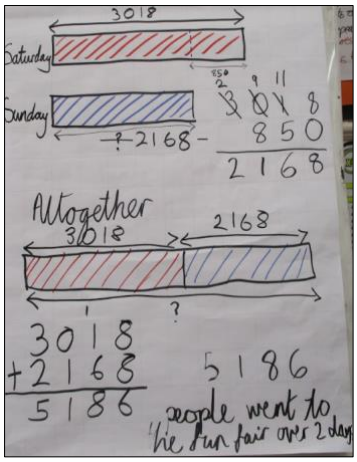

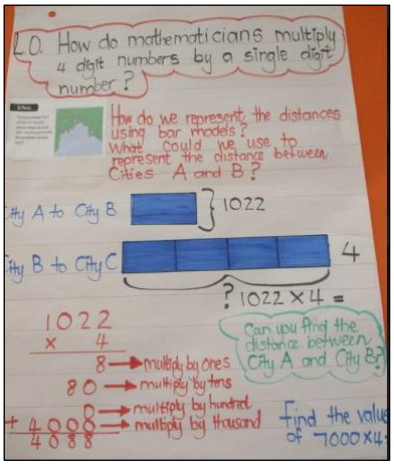

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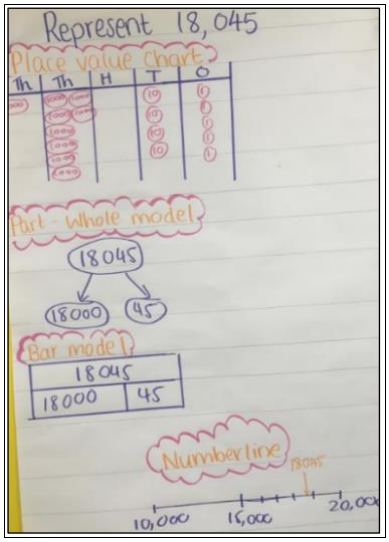

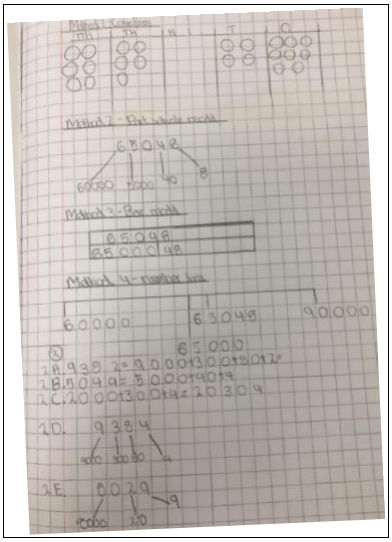

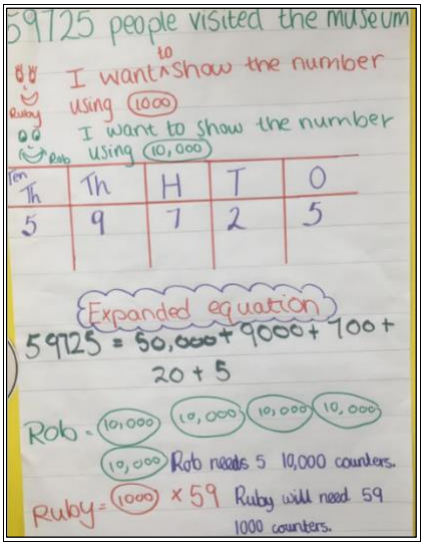

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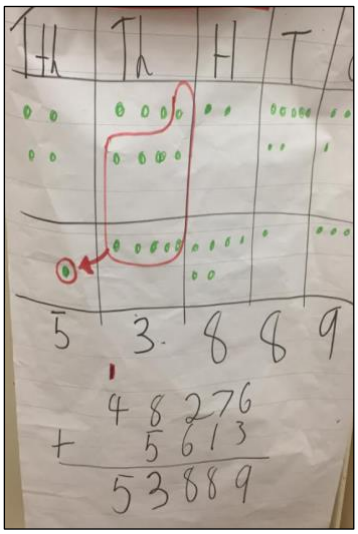
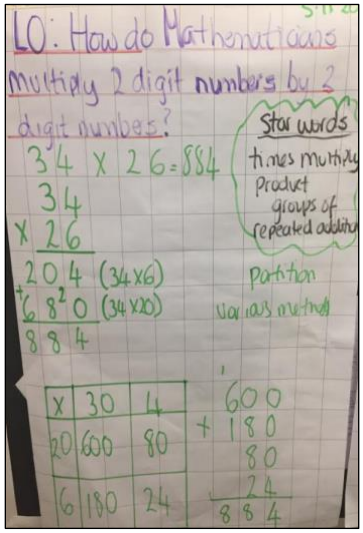
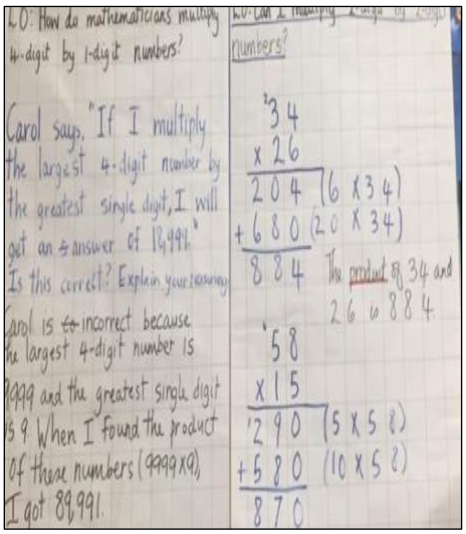




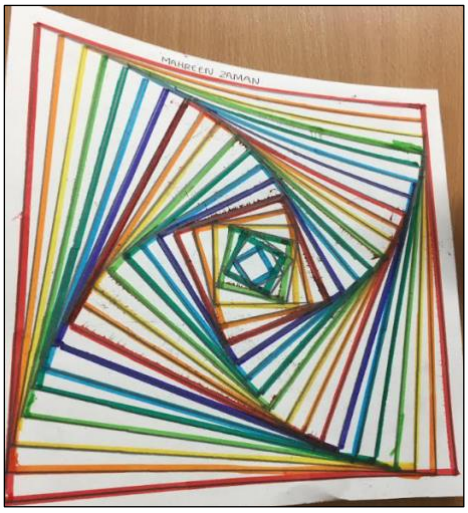


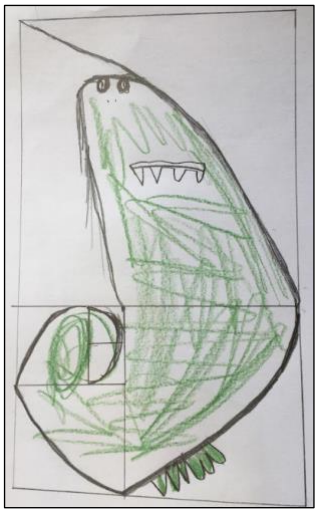
Enrichment Opportunities

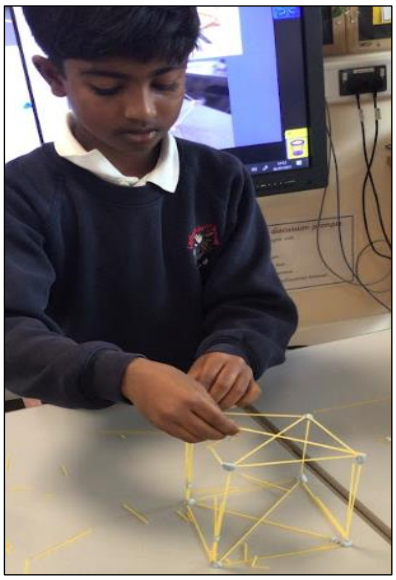
Our children also celebrate special maths days to raise the profile of maths in our school.

Maths Week London

We celebrated Maths Week London 2022, a special annual event that raises the profile of maths across the capital and which builds children's confidence, nurturing a love of maths and sparking an interest in a subject that impacts all of our lives, every day!

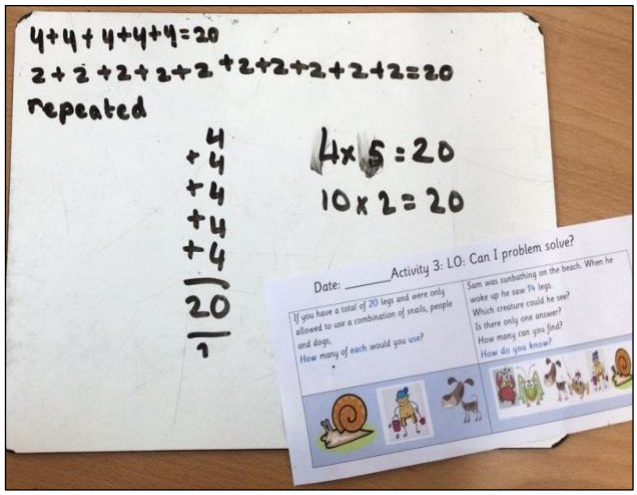


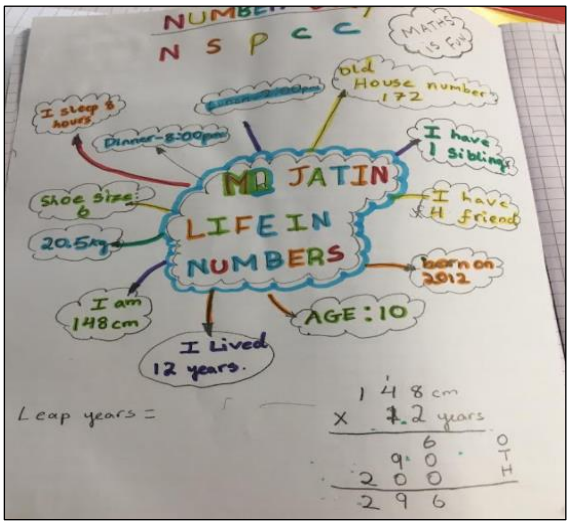


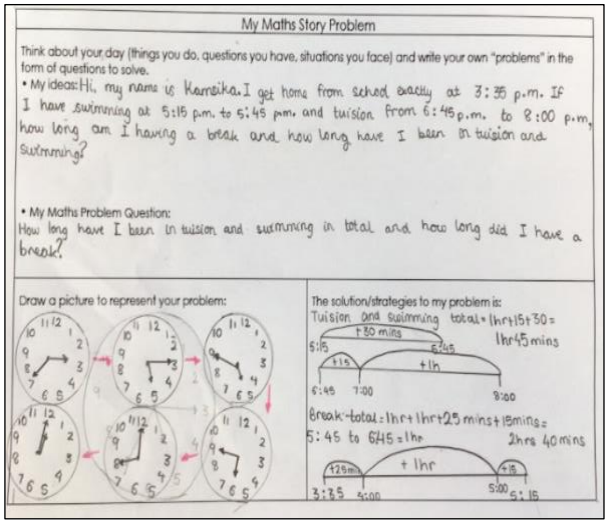



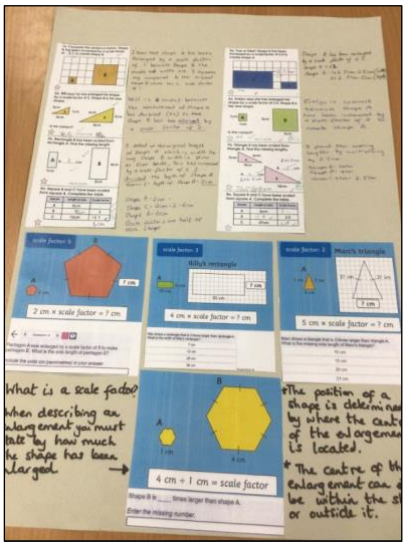
NSPCC Number Day

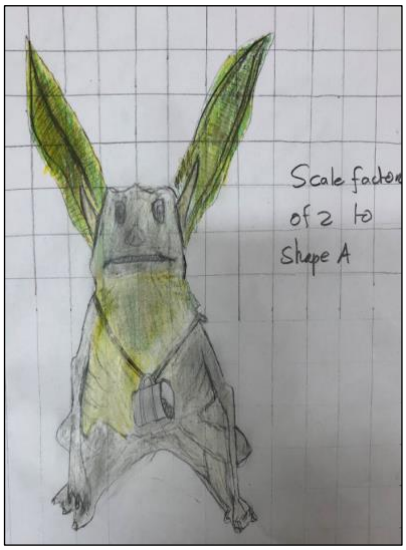
We support the NSPCC by taking part in the annual Number Day. Children take part in fun curriculum-based maths challenges based around mathematical stories.











Resources / Useful websites

Times Tables Rockstars
https://ttrockstars.com

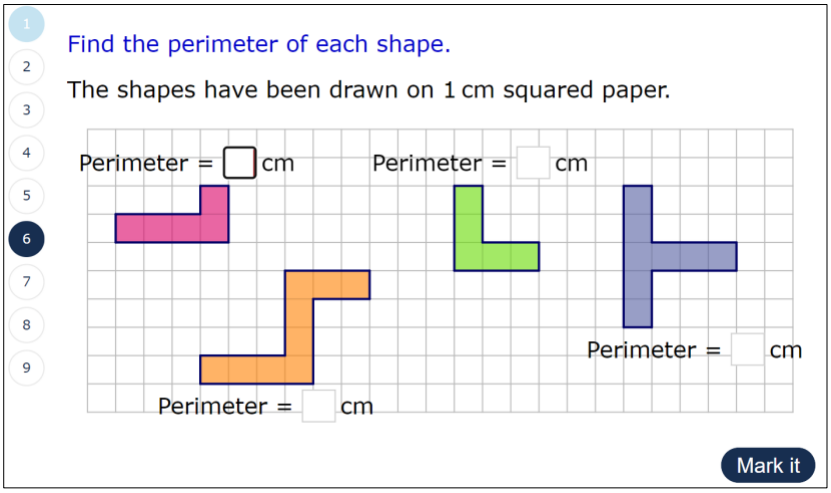
Times Tables Rock Stars is an on-line learning resource which helps children to learn the times tables and related division facts. It is a carefully sequenced programme of daily times tables practice. Teachers can select the times tables they would like children in their class to practise. Children have opportunities to play against their peers, class and against other schools in the online contests.

We use this resource as part of the home learning offer.

This resource has very successfully boosted times tables recall speed for hundreds of thousands of pupils over the last 8 years in over 14,000 schools – both primary and secondary – worldwide.

My Maths
https://www.mymaths.co.uk/

Providing complete curriculum coverage, MyMaths offers interactive lessons, “booster packs” for revision, and is used to assign home learning used to develop our children’s confidence and fluency in maths.



White Rose
https://whiterosemaths.com/parent-resources

White Rose’s ‘home learning’ lessons support the learning we do in school.