LEARNING
WITHOUT LIMITS

Successful learners
Confident individuals
Responsible Citizens

Ladybrook Primary School

Mathematics

Our school intention for Mathematics

Ambitious Curriculum

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

William Paul Thurston

Our children will:

- Be numerate
- Be confident to engage in challenging problem solving
- Be able to reason mathematically using appropriate vocabulary;
- Enjoy and be curious about the subject;
- Be able to apply existing knowledge and skills when approaching the next part of their learning journey;
- Understand that mathematics is essential in everyday life and helps us to make sense of the world.

How have we constructed and renewed the curriculum for Mathematics?

- **The story so far: September 2019** Joined North West Maths Hubs and started the Teaching for Mastery training. We are currently in the Sustaining Phase. White Rose Maths.

- **Subject leader Training: Maths Hub m**eetings throughout the year.

In 2023 -24 we were part of the 'Improving competence of pupils below ARE including SEND' in the sustaining phase. This will remain a focus in 2024-25. Action Research project - improving girls' confidence in maths.

- **Staff Training:**

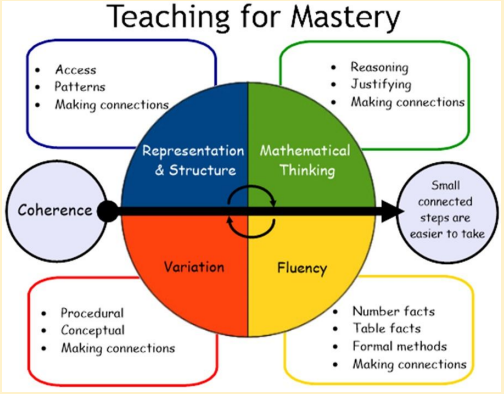
In 2022-23 staff attended training for their year group alongside CM.
Staff Meetings - CPA approach, Bar Modelling, Importance of vocabulary and questioning, Maths displays.

All staff have observed CM/RF and then we have carried out team teaching across the school.

Tas have received training about CPA approaches, their role and the importance of questioning.

Mastering Number Training for R, Year 1 and Year 2. Applied for KS2.

ECT NCETM Maths Hub Training



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What policy decisions have we made about Mathematics?

- At Ladybrook Primary School, we follow the Maths Mastery approach to teaching the subject, in the belief that deep and sustainable mathematical learning is achievable for all. This approach enables children to reason about concepts and to make connections while building on previous learning. We use White Rose to ensure progression through small steps, fluency, variation, mathematical thinking and representation and structure.
- The Maths Mastery Approach has a clear rationale: to be competent mathematicians, children need to develop the three forms of knowledge:
- **Factual** - I know that...
- **Procedural** - I know how...
- **Conceptual** - I know why...
- Our Calculation Policy reflects our CPA approach: concrete, pictorial and abstract.
- Concrete - hands on using real objects
- Pictorial - representations such as a diagram or picture of the problem
- Abstract - the symbolic stage using mathematical notation
- In addition to our online maths scheme. we use Mathletics which is an online maths resource used across the whole school. It is also accessible from home through a school login. Mathletics trophies are used to celebrate children's achievements.
- To improve the rate at which children acquire instant recall of number bonds and times tables, we use Numbots which test mental arithmetic of number bonds and Times Tables Rockstars, which test times tables acquisition with a focus on **instant recall**.
- Each term parents will receive a class curriculum newsletter containing information about the Maths their child will be working on.

What does our Progression for Mathematics look like? Why?

Progression starts in EYFS using the EYFS Framework, Development Matters and the ELGs as end points.

Mastering Number starts in Reception and continues in Year 1 and 2.

White Rose is used from Reception to Year 6.

Mastering Number

Year 1 Overview

Term 1	Term 2	Term 3
Pupils will have an opportunity to consolidate the Early Learning Goals and continue to explore the composition of numbers within 10, and the position of these numbers in the linear number system. **Pupils will:** • subitise within 5, including when using a rekenrek, and re-cap the composition of 5 • develop their understanding of the numbers 6 to 9 using the '5 and a bit' structure • compare numbers within 10 and use precise mathematical language when doing so • re-cap the order of numbers within 10 and connect this to '1 more' and '1 less' than a given number	Pupils will continue to explore the composition of numbers within 10 and explore addition and subtraction structures and the related language (without the use of symbols). **Pupils will:** • explore the composition of each of the numbers 7 and 9 • explore the composition of odd and even numbers, seeing that even numbers can be made of two odd or two even parts, and that odd numbers can be composed of one odd part and one even part • identify the number that is two more or two less than a given odd or even number, identifying that two more/ less than an odd number is the next/ previous odd number, and two more/ less than an even number is the next/ previous even number	Pupils will explore the composition of numbers within 20 and their position in the linear number system. They will connect addition and subtraction expressions and equations to 'number stories'). **Pupils will:** • explore the composition of the numbers 11 to 19 as '10 and a bit' and compare numbers within 20 • connect the composition of the numbers 11 to 19 to their position in the linear number system, including identifying the midpoints of 5, 10 and 15 • compare numbers within 20 • understand how addition and subtraction equations can represent previously explored structures of addition and subtraction (aggregation/ partitioning/ augmentation/ reduction)

Children in reception will be learning to:	Examples of how to support this:
Count objects, actions and sounds.	Develop the key skills of counting objects including saying the numbers in order and matching one number name to each item. Say how many there are after counting – for example, "…6, 7, 8. There are **8 balls**" – to help children appreciate that the last number of the count indicates the total number of the group. This is the cardinal counting principle. Say how many there might be before you count to give a purpose to counting: "I think there are about 8. Shall we count to see?" Count out a smaller number from a larger group: "Give me seven…" Knowing when to stop shows that children understand the cardinal principle. Build counting into everyday routines such as register time, tidying up, lining up or counting out pieces of fruit at snack time. Sing counting songs and number rhymes and read stories that involve counting. Play games which involve counting. Identify children who have had less prior experience of counting and provide additional opportunities for counting practice.

EYFS Development Matters 2020 Statements and ELGs **Mathematics**

Birth to Three

- Combine objects like stacking blocks and cups. Put objects inside others and take them out again.
- Take part in finger rhymes with numbers.
- React to changes of amount in a group of up to three items.
- Compare amounts, saying 'lots', 'more' or 'same'.
- Develop counting-like behaviour, such as making sounds, pointing or saying some numbers in sequence.
- Count in everyday contexts, sometimes skipping numbers - '1-2-3-5.'
- Climb and squeeze themselves into different types of spaces.
- Build with a range of resources.
- Complete inset puzzles.
- Compare sizes, weights etc. using gesture and language - 'bigger/ little/ smaller', 'high/low', 'tall', 'heavy'.
- Notice patterns and arrange things in patterns.

Three and Four-Year-Olds

- Develop fast recognition of up to 3 objects, without having to count them individually ('subitising').
- Recite numbers past 5.
- Say one number for each item in order: 1,2,3,4,5.
- Know that the last number reached when counting a small set of objects tells you how many there are in total ('cardinal principle').
- Show 'finger numbers' up to 5.
- Link numerals and amounts: for example, showing the right number of objects to match the numeral, up to 5.
- Experiment with their own symbols and marks as well as numerals.
- Solve real world mathematical problems with numbers up to 5.
- Compare quantities using language: 'more than', 'fewer than'.
- Talk about and explore 2D and 3D shapes (for example, circles, rectangles, triangles and cuboids) using informal and mathematical language: 'sides', 'corners', 'straight', 'flat', 'round'.
- Understand position through words alone – for example, "The bag is under the table," – with no pointing.
- Describe a familiar route.
- Discuss routes and locations, using words like 'in front of' and 'behind'.
- Make comparisons between objects relating to size, length, weight and capacity.
- Select shapes appropriately: flat surfaces for building, a triangular prism for a roof, etc.
- Combine shapes to make new ones – an arch, a bigger triangle, etc.
- Talk about and identifies the patterns around them. For example: stripes on clothes, designs on rugs and wallpaper. Use informal language like 'pointy', 'spotty', 'blobs', etc.
- Extend and create ABAB patterns – stick, leaf, stick, leaf.
- Notice and correct an error in a repeating pattern.
- Begin to describe a sequence of events, real or fictional, using words such as 'first', 'then...'

Children in Reception

- Count objects, actions and sounds.
- Subitise.
- Link the number symbol (numeral) with its cardinal number value.
- Count beyond ten.
- Compare numbers.
- Understand the 'one more than/one less than' relationship between consecutive numbers.
- Explore the composition of numbers to 10.
- Automatically recall number bonds for numbers 0–5 and some to 10.
- Select, rotate and manipulate shapes in order to develop spatial reasoning skills.
- Compose and decompose shapes so that children recognise a shape can have other shapes within it, just as numbers can.
- Continue, copy and create repeating patterns.
- Compare length, weight and capacity.

Early Learning Goals

Number

- Have a deep understanding of number to 10, including the composition of each number.
- Subitise (recognise quantities without counting) up to 5.
- Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts.

Numerical Patterns

- Verbally count beyond 20, recognising the pattern of the counting system.
- Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity.
- Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.

EYFS maths is delivered by:
Outdoor learning opportunities eg sorting, patterns, counting (stones, leaves, twigs)
Adult led carpet sessions and small groups
Spontaneous activities (child initiated) eg count small groups and a child wanted to sort in patterns.

What does our Progression for Mathematics look like? Why?

Our progression map for Mathematics has been designed to ensure that steps in learning <u>between</u> year groups for all aspects of the subject are incremental to support sound understanding and long term recall. For example, the acquisition of addition and subtraction has been planned to build from Year 1 to Year 6.

We believe repeated encounters benefit the children greatly. These are built in in Flashback 4.

Addition & subtraction: Calculations

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
• add and subtract one-digit and two-digit numbers to 20, including zero	• add and subtract numbers using concrete objects, pictorial representations, and mentally, including: ➢ a two-digit number and ones ➢ a two-digit number and tens ➢ two two-digit numbers ➢ adding three one-digit numbers	• add and subtract numbers mentally, including: ➢ a three-digit number and ones ➢ a three-digit number and tens ➢ a three-digit number and hundreds • add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction	• add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate	• add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) • add and subtract numbers mentally with increasingly large numbers	• perform mental calculations, including with mixed operations and large numbers • use their knowledge of the order of operations to carry out calculations involving the four operations
Autumn 2 Spring 2	Autumn 2	Autumn 2	Autumn 2	Autumn 2	Autumn 2

Calculation policy linked to WR - shows progression and appropriate CPS approaches for each year group.
https://docs.google.com/document/d/17QRewbe-kUVfuaEQ8hgrmR

What does our Progression for Mathematical vocabulary look like? Why?

Vocabulary is planned for each year group and broken down into each strand of learning. This allows the teacher to ensure is it explicitly taught. Repetition of language is vital and we use 'I say, we say, you say' throughout the school.

As much as vocabulary is planned for EYFS, the staff use opportunities to introduce new language and discuss the meaning throughout the day.

Stem sentences are used to further support children's mathematical language and to develop reasoning skills. They help with retention and recall.

Each class has stem sentences on display that are relevant to their year group.

Stem sentences are used repeatedly throughout Mastering Number which aid with retention and recall.

Maths Vocabulary for Year 3

Number and place value	Addition and subtraction	Multiplication and division	Measure	Geometry (position and direction)	Geometry (properties of shape)	Fractions	Data/statistics
Numbers to one thousand	Column addition and subtraction	Product Multiples of four, eight, fifty and one hundred Scale up	Leap year Twelve-hour/twenty-four- hour clock Roman numerals I to XIII	Greater/less than ninety degrees Orientation (same orientation, different orientation)	Horizontal, perpendicular and parallel lines	Numerator, denominator Unit fraction, non-unit fraction Compare and order Tenths	Chart, bar chart, frequency table, Carroll diagram, Venn diagram Axis, axes Diagram

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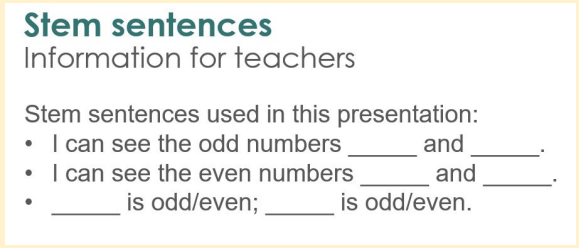
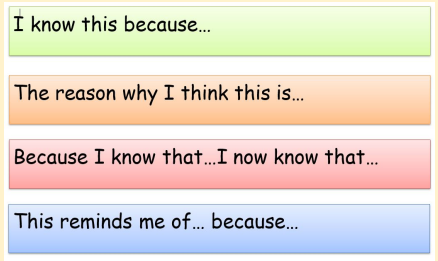
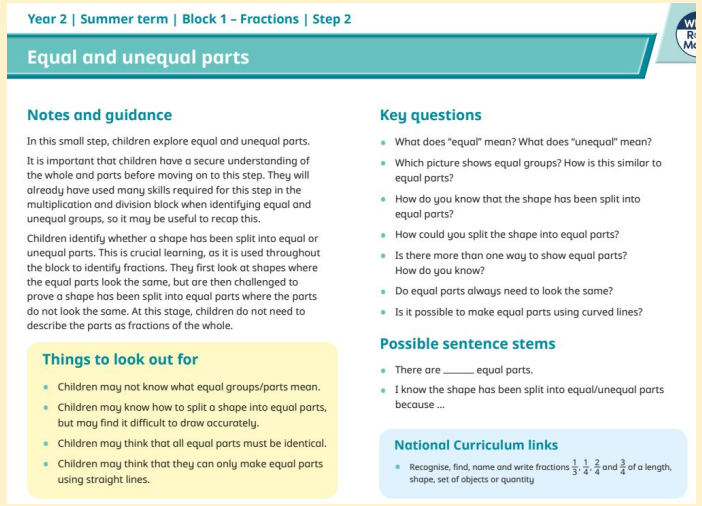
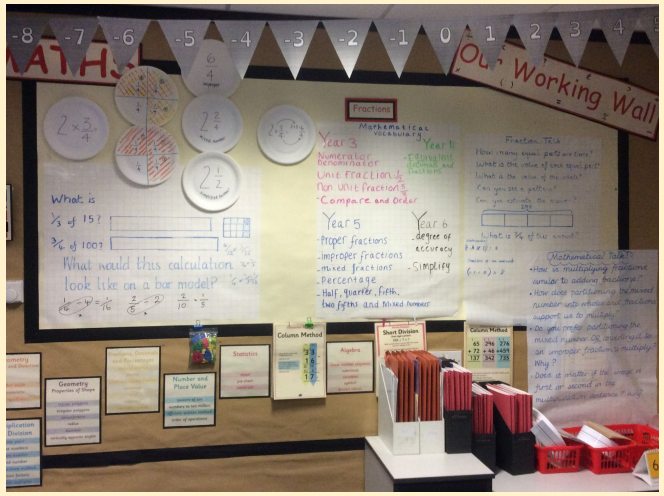






White Rose planning uses stem sentences which are incorporated into all lessons to prompt children's thinking and verbal reasoning.

What <u>essential knowledge*</u> do we want our children to acquire? How do we ensure it is retained?

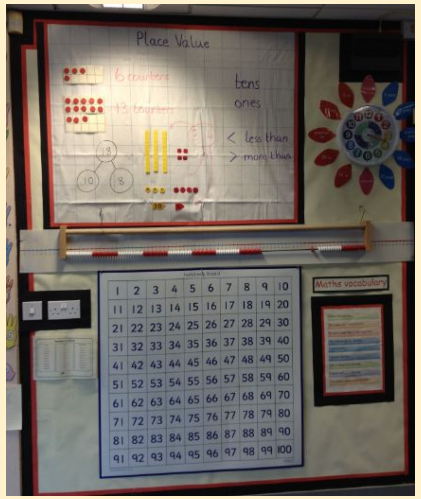


Number bonds and multiplication facts are practised and assessed regularly form Year 1 to Year 6.

- Children in Key Stage 1 have a NumBots account.

- Children in Year 2 and Key Stage 2 have a TTRS account.

- Use of red baskets on tables for children to access resources.



- Working walls are used to remind children of CPA approaches.
- Relevant stem sentences and current vocabulary being used in the lessons.

- Mathletics tasks are set in Year 1-6. Effort is recognised by awarding a Mathletics trophy.

- Repeated encounters are planned for to ensure essential knowledge is retained.

How do we ensure inclusion in Mathematics?

Upskilling teachers and teaching assistants

Supporting parents

A growth mindset culture

Resourcing including red baskets

Adaption of teaching

An enabling environment

Scaffolding and modelling - small steps

Peer support

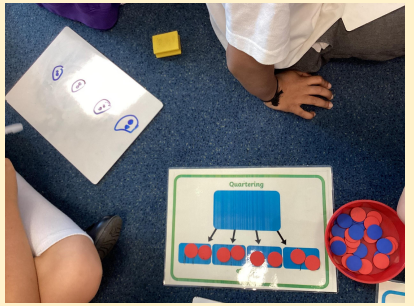
Pre-teaching of vocabulary

Girl Power Maths club – following Pupil Progress meetings, girls were identified. Carried out pre teaching in the sessions as well as addressing gaps.

Impact:

Comparing PUMA from Year 2 to 3 and Year 3 to 4.
Shows increase in their standardised score.

In 2023 -24 we were part of the 'Improving competence of pupils below ARE including SEND' in the sustaining phase. This will remain a focus in 2024-25



How do children demonstrate that they know more and remember more?

- Daily fluency – number bonds and multiplication facts
- PUMA termly assessments
- Maths Walls
- Summative data – end of EYFS and Year 6
- Formative assessment throughout lessons - prior knowledge, mini plenaries
- Subject leader pupil Voice
- Whole school progress displays
- Pupil Progress meetings and moderation

Parental Workshop - Spring 2025

- January 2025 - Workshop for Year 6 parents
- Focus on teaching the parents the methods used in Year 6.

- February 2025 - Workshop for N, R, Year 1 and 2 parents
- Focus on explaining what Mastering Number is and launch the Mastering Number at Home project.

- March 2025 - Workshop for Year 3, 4 and 5 parents
- Focus on explaining what Mastering Number is and the importance of a secure knowledge of multiplication facts in preparation for the MTC at the end of Year 4.