FULBOURN PRIMARY SCHOOL

Our Approach to...

Maths

Aims:

- To develop fluency in the fundamentals of mathematics, enabling pupils to recall essential facts accurately and efficiently and to use procedures with confidence.
- To develop mathematical reasoning. Pupils learn to explain their thinking, make connections, identify patterns and justify their choices using precise mathematical vocabulary.
- To enable pupils to solve problems by applying their mathematical knowledge flexibly in a range of contexts, including real-life situations and other areas of the curriculum.
- To nurture positive attitudes towards mathematics so that children are curious, resilient and confident, and understand that everyone can become a successful mathematician.
- To provide a coherent, carefully sequenced curriculum in which key concepts are revisited and built upon, supporting all pupils to develop secure understanding and make progress.

Research base:

- Ofsted (2023). Coordinating mathematical success: the mathematics subject report. https://www.gov.uk/government/publications/subject-report-series-maths/coordinating-mathematical-success-the-mathematics-subject-report
- National Centre for Excellence in the Teaching of Mathematics (NCETM): mastery, Teaching for Mastery, Mastering Number, Curriculum Prioritisation and Ready to Progress materials. https://www.ncetm.org.uk/
- NRICH, University of Cambridge: rich mathematical tasks and problem-solving resources. https://nrich.maths.org/
- I See Maths: professional development and classroom resources to support mathematical thinking and teaching.
- Department for Education (2020). Mathematics guidance: key stages 1 and 2 – Ready-to-progress criteria and core representations.
- Department for Education (2020). Mathematics guidance: supporting pupils to develop foundational knowledge of number facts.

Our Approaches:

A carefully sequenced curriculum

Our curriculum follows the NCETM scheme of learning, which provides a cumulative sequence of small steps from which pupils build secure mathematical understanding. Teachers adapt the materials to respond to pupils' prior knowledge and needs. Progression documents set out when National Curriculum objectives are taught across number, measurement, geometry and statistics. Concepts are revisited in different contexts so that pupils can make connections and retain what they have learned.

We use the NCETM Curriculum Prioritisation materials and Ready to Progress criteria to support decisions about essential knowledge, identify gaps in prior learning and ensure that pupils are prepared for the next stage. Teachers consider the important knowledge pupils need to secure before moving on, rather than simply completing content at pace. The Ready-to-Progress criteria help teachers identify the essential concepts and procedures pupils need at each stage, including number and place value, number facts, calculation, fractions and geometry. They support planning, formative assessment and timely responses to gaps, while the core representations guidance helps teachers choose models aligned to these objectives.

Mastery as an approach

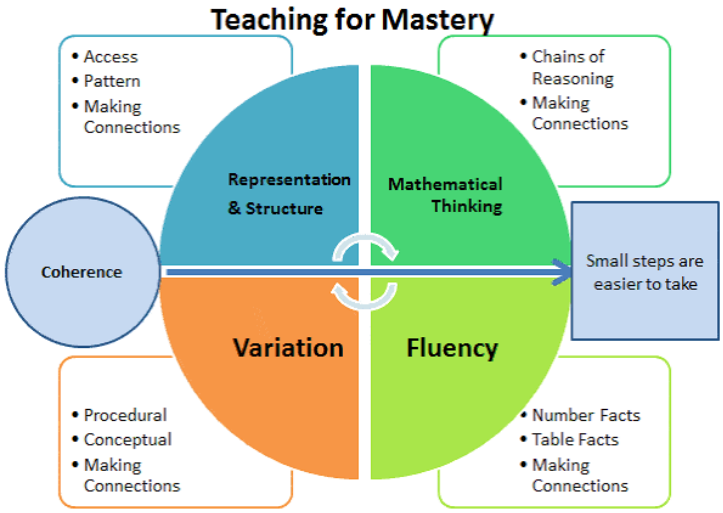
We use a mastery approach in which pupils develop a deep and connected understanding of mathematical ideas. The intention is for all pupils to access ambitious learning and to develop fluency, reasoning and problem-solving, rather than learning procedures without understanding. Teachers break learning into manageable steps, make mathematical structures explicit and provide carefully chosen examples and practice.

Pupils are supported to understand why a method works, when it is useful and how it connects to other ideas. Tasks commonly offer a shared starting point with opportunities to deepen thinking through increasingly complex examples, reasoning and problem-solving. Teachers respond to assessment and adapt the pace, scaffolding and practice so that important knowledge is secure.

The five big ideas in teaching for mastery

Our mastery approach is informed by the NCETM's five big ideas: coherence, representation and structure, mathematical thinking, fluency and variation. These ideas work together to help pupils build connected understanding, rather than learning isolated facts or procedures.

Learning is carefully sequenced so that new ideas build on secure prior knowledge. Teachers use representations to make mathematical structure visible, encourage pupils to explain and compare their thinking, and provide purposeful practice to develop fluency. Examples and questions are varied deliberately so pupils recognise what stays the same, what changes and why a method works.



Core representations and mathematical structure

Teachers select representations to match the mathematical idea and the intended learning. These include tens frames, number lines, Gattegno charts, partitioning diagrams and bar models, and groups of units such as Dienes equipment and place-value counters. Representations are used across year groups to support progression in number and place value, calculation, fractions and other areas of mathematics.

The aim is for pupils to see and describe the mathematics represented, make connections between models and symbols, and increasingly form mental images they can use independently. Teachers explain what a representation shows, what it does not show, and how it connects to other representations and to formal notation.

Concrete, pictorial and abstract representations (CPA)

Teachers use the concrete-pictorial-abstract (CPA) approach to help pupils make sense of mathematical concepts. Concrete resources, such as counters, cubes, place-value equipment and other manipulatives, allow pupils to explore quantities and relationships. Pictorial representations make these relationships visible, while abstract symbols and notation allow pupils to record and manipulate mathematical ideas.

These representations are selected purposefully and used alongside one another, rather than treated as separate stages that every pupil must complete in a fixed order. Teachers draw attention to the mathematical structure represented, make links between representations and gradually adjust support as pupils become more secure.

Fluency, number facts and arithmetic

Fluency is developed through frequent, purposeful practice. Lessons begin with fluency questions to revisit prior learning and practise mental arithmetic. Pupils regularly rehearse number bonds, calculation strategies, times tables and other essential facts so that recall becomes increasingly rapid and accurate. Counting is practised every day and follows a clear progression: counting objects and forwards and backwards in ones; counting from any starting point and across tens, hundreds and thousands; counting in multiples; and progressing to fractions, decimals and negative numbers as appropriate. Pupils build confidence and fluency at each stage before moving on, with practical and active approaches used to make practice purposeful.

In Reception and Key Stage 1, we use the NCETM Mastering Number approach to develop strong foundations in number sense, calculation fluency, confidence and flexibility. In Year 4, we also deliver the NCETM Mastering Number programme to support pupils in securing rapid recall of multiplication and division facts, while developing a deeper understanding of number relationships and the connections between times tables.

Across the school, teachers use short practice activities, choral responses, songs, rhymes and low-stakes retrieval where appropriate. Times Tables Rock Stars supports pupils to practise multiplication facts in school and at home. We prioritise secure recall of addition and subtraction facts within 10, extending to facts across 10 by the end of Key Stage 1, and continue regular practice in Year 3. Multiplication and division facts are taught in connected families, with fluent recall of the multiplication tables and related division facts expected by the end of Year 4; practice continues in Year 5 and beyond to maintain fluency. Pupils learn to use known facts and relationships, not only to recite number sequences.

Reasoning and problem-solving

Pupils have regular opportunities to reason mathematically and solve problems. They explain how they know, compare methods, spot patterns, make conjectures and justify their answers. Teachers use questions such as “What do you notice?”, “What is the same and what is different?” and “Convince me” to reveal pupils’ thinking and develop mathematical talk.

NRICH activities and I See Maths resources are used alongside the core scheme to enrich learning, encourage pupils to think deeply and provide opportunities to explore problems in different ways. Tasks are chosen to support the intended mathematical learning and to promote curiosity, creativity and perseverance.

Mathematical language and communication

Precise mathematical vocabulary is explicitly introduced, modelled and revisited. Teachers use and expect accurate language when explaining concepts and methods. Pupils are given time to articulate their thinking, listen to alternative strategies and respond to others’ reasoning. Sentence stems, worked examples, visual prompts and partner talk are used where they help pupils communicate their ideas clearly.

Assessment and responsive teaching

Teachers regularly check what pupils know and understand before, during and after teaching. Ready to Progress assessment questions and other formative assessment help teachers identify whether pupils have the prior knowledge needed for new learning. Questioning, observation, pupil explanations, practice and work in books help teachers identify misconceptions promptly. Checks are informed by the Ready-to-Progress criteria and focus on whether pupils can demonstrate the key learning and prerequisite knowledge, not simply whether they have completed a task.

Teaching is responsive: teachers revisit concepts, provide additional modelling and practice, and adapt subsequent lessons in response to what pupils demonstrate. Where appropriate, same-day support and pre-teaching help pupils revisit essential knowledge. Assessment is used to inform next steps and celebrate what pupils have learned, not simply to record what they cannot yet do.

Calculation and mathematical recording

The school’s calculation guidance supports a logical progression in procedural knowledge. Pupils move from informal and expanded strategies towards more efficient and formal written methods when their understanding is secure. Teachers model methods clearly and explain the mathematical thinking behind each step.

Teachers explicitly teach the presentation of mathematical work, including the clear layout of calculations and recording. Consistent presentation supports pupils to follow methods, notice patterns and identify errors. Worked examples and maths working walls provide accessible reference points for independent practice.

Mathematics in the wider world

We want children to recognise that mathematics is everywhere. Teachers make connections with everyday life and, where meaningful, with other curriculum subjects. Pupils encounter mathematics

through practical contexts involving number, measure, shape, data and problem-solving, helping them understand its usefulness and relevance beyond the classroom.

Inclusion by Design

Mathematics teaching is designed to be accessible from the outset. Teachers anticipate potential barriers and plan models, representations, vocabulary, scaffolds and opportunities for practice so that pupils can engage with the intended learning. High expectations are maintained, while support and teaching are adapted to pupils' needs.

Access and participation

- Lessons begin with a low-threshold entry point so that every pupil can notice, contribute and begin to think mathematically.
- Where appropriate, pupils work in mixed-attainment pairs and collaborate on rich tasks.
- Teachers use inclusive pedagogies, e.g. think–prepare–pair–share routines, sentence stems and visual supports to encourage mathematical talk.
- Concrete resources and pictorial representations are readily available and used to reveal mathematical structure, not simply to make tasks easier.
- Tasks often share a common learning objective and provide opportunities to deepen understanding through increasing complexity. Teachers adapt this approach when pupils need different content or more sustained teaching of prerequisite knowledge.
- Key vocabulary may be pre-taught so pupils can participate with greater confidence when the concept is introduced to the class.
- Worked examples, carefully designed worksheets and maths working walls help pupils focus on the intended mathematical learning without unnecessary distraction.
- Teachers explicitly teach essential facts and provide regular opportunities for practice, helping pupils build confidence and reduce avoidable errors.
- Classrooms foster a positive culture in which mistakes are treated as a valuable part of learning. Pupils are encouraged to explain their thinking, persevere and learn from misconceptions.

High expectations and responsive support

Inclusion does not mean expecting every pupil to learn in exactly the same way or at the same pace. Teachers check whether pupils have secured the knowledge needed for the next step and provide additional modelling, pre-teaching, guided practice or intervention where necessary. For some pupils, particularly those working significantly below age-related expectations, it may be more appropriate to revisit prerequisite content through carefully matched tasks before rejoining the wider sequence. The aim is meaningful access to mathematics, secure learning and sustained progress for every child.

Glossary:

Abstract: Representing mathematical ideas using symbols, numerals and notation.

Arithmetic: Calculating with numbers using operations such as addition, subtraction, multiplication and division.

Calculation strategy: A method or sequence of steps used to work out a calculation.

Concrete: Using physical objects or manipulatives to explore and represent mathematical ideas.

CPA: Concrete-pictorial-abstract: an approach linking objects, visual representations and mathematical symbols.

Coherence: A carefully sequenced approach in which learning builds logically from what pupils already know.

Fluency: Accurately and efficiently recalling facts and carrying out methods, while recognising when and how to use them.

Mastering Number: An NCETM programme supporting the development of secure number sense and fluency, particularly in Reception and Key Stage 1.

Mastery: An approach that aims for deep, connected understanding, fluency, reasoning and problem-solving for all pupils.

Manipulative: A physical resource, such as counters or place-value equipment, used to represent mathematical ideas.

Mathematical thinking: Making connections, exploring patterns, explaining ideas and justifying conclusions.

Mathematical reasoning: Explaining, justifying and making deductions about mathematical ideas.

NCETM: The National Centre for Excellence in the Teaching of Mathematics.

NRICH: A University of Cambridge project providing rich mathematical tasks and problem-solving resources.

Representation and structure: Using models, images and symbols to reveal the relationships and structure within mathematics.

Pictorial representation: A drawing, diagram or visual model used to represent mathematical relationships.

Problem-solving: Applying mathematical knowledge and strategies to investigate and solve a problem.

Ready to Progress: NCETM materials identifying important learning that pupils should secure to support progression.

Retrieval practice: Revisiting previously learned knowledge to strengthen recall.

Small steps: A carefully sequenced progression that breaks learning into manageable stages.

Times Tables Rock Stars: An online programme used to support practice and recall of multiplication facts.

Variation: Deliberately changing examples or questions to help pupils notice important mathematical relationships and distinguish between concepts.

White Rose Maths: The scheme of learning used by the school to support a sequenced, cumulative mathematics curriculum.