



Barham Primary School

Safe, Happy, Learning
Embedding Excellence



Mathematics Curriculum Statement; Intent, Implementation and Impact

Intent: What we want our pupils to learn?

At Barham Primary School, we offer the children a progressive mathematics curriculum based on the National Curriculum to develop mathematical knowledge and skills for our children.

- Pupils will be positive and enthusiastic towards mathematics, with an awareness of the diversity of the subject.
- Pupils will be competent and confident in taking risks to apply mathematical knowledge, concepts and skills.
- Pupils will be able to solve problems, reason mathematically and think logically and systematically.
- Pupils will be able to work independently and in cooperation with others.
- Pupils will be able to use and apply mathematics across the curriculum, and to understand the application of mathematics in real life contexts and scenarios.

All children have equal access to the mathematics curriculum, regardless of race or gender. Children access the curriculum at the level appropriate to them, ensuring rapid measurable progress. Resources and learning environments are planned and designed to enable all children to access the learning required. Adaptive teaching activities are provided to support less able learners and challenge rapid graspers so they are able to work at greater depth in mathematics. The mathematics curriculum is ambitious for pupils with SEND to ensure they can access the subject at an appropriate level and make progress towards clearly defined end points.

Mathematical knowledge can be linked to engaging topics but will be gained by the teaching of year group progressive skills which build on previous learning, ensuring pupils' learning becomes embedded. In addition to this, pupils will engage in enrichment activities to support their learning of mathematics for a real purpose through the rest of the curriculum.

Curriculum:

Mathematics is a core subject of the National Curriculum. The knowledge, skills and understanding are set out in the "Mathematics Programmes of Study". The programmes of study set out what pupils should be taught and the attainment targets set out the expected standards of pupils' performance.

By using statutory curriculum criteria and other relevant planning documentation, we ensure that every year group covers the following key skills:

- Number and Place Value
- Addition and Subtraction
- Multiplication and Division
- Fractions, Decimals and Percentages
- Ratio and Proportion (Y6)
- Algebra (Y6)
- Measurement
- Geometry
- Statistics

In addition, we strongly support the theory that mental computation is the foundation of being numerate. We teach mental maths discretely at the beginning of every maths lesson or as a full lesson where new concepts are introduced. Similarly, we consider the application of mathematics to problem solving and reasoning a vital skill and focus heavily on the developing pupil's abilities in this area. Friday Fun Maths 'lessons' are timetabled weekly in order to reinforce this intent and provide an

engaging opportunity for all pupils to demonstrate their understanding and unconscious competence in knowledge, concepts and procedures within a different context, drawing connections across different ways of looking at mathematical ideas.

By the end of EYFS children will:

Have a secure understanding of Number and Numerical Patterns across the EYFS Framework. Children will have a deep understanding of numbers to 10, being able to develop their skill of subitising up to 5 as well as automatically recalling number bonds up to 5 and even 10. Furthermore, children will be able to verbally count beyond 20, recognising the counting system, comparing quantities up to 10 in various contexts and exploring and representing numbers within 10, including odds, evens and doubles. The EYFS children will use every day language to talk about size, weight, capacity, position, distance, time and money to compare quantities and objects in order to help them solve problems. They will recognise, create and describe patterns, exploring characteristics of everyday objects and shapes, using their mathematical language to describe them.

By the end of Key Stage 1 children will:

Develop confidence and mental fluency with whole numbers, counting and place value. This should involve working with numerals, words and the four operations, including with practical resources, e.g. concrete objects and measuring tools. Pupils should develop their ability to recognise, describe, draw, compare and sort different shapes and use the related vocabulary. They should also use a range of measures to describe and compare different quantities such as length, mass, capacity/volume, time and money. By the end of year 2, pupils should know their number bonds to 20 and be precise in using and understanding place value. An emphasis on practice at this early stage will aid fluency. Pupils should read and spell mathematical vocabulary at a level consistent with their increasing word reading and spelling knowledge at key stage 1.

By the end of Lower Key Stage 2 children will:

Become increasingly fluent with whole numbers and the four operations, including number facts and the concept of place value. They will develop efficient written and mental methods and perform calculations accurately with increasingly large whole numbers. Pupils should develop their ability to solve a range of problems, including with simple fractions and decimal place value. Pupils will have the opportunity to draw with increasing accuracy and develop mathematical reasoning so they can analyse shapes and their properties and confidently describe the relationships between them. It should ensure that they can use measuring instruments with accuracy and make connections between measure and number. By the end of year 4, pupils should have instant recall of their multiplication tables up to and including the 12 multiplication table and show precision and fluency in their work. Pupils should read and spell mathematical vocabulary correctly and confidently using their growing word reading knowledge and their knowledge of spelling.

By the end of Upper Key Stage 2 children will:

Extend their understanding of the number system and place value to include larger integers. This should develop the connections that pupils make between multiplication and division with fractions, decimals, percentages and ratio. Pupils should 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. With this foundation in arithmetic, pupils are introduced to the language of algebra as a means for solving a variety of problems. Teaching in geometry and measures should consolidate and extend knowledge developed in number. Pupils will classify shapes with increasingly complex geometric properties and that they learn the required vocabulary they need to describe them. By the end of year 6, pupils should be fluent in written methods for all four operations, including long multiplication and division, and in working with fractions, decimals and percentages. Pupils should read, spell and pronounce mathematical vocabulary correctly. Any child working below their age-related expectation, will receive a tailored curriculum with personalised objectives. This will enable all children to build the skills and knowledge needed to bridge the gap between themselves and their peers enabling them to reach their full potential.

Implementation: How we plan and teach Mathematics?

At Barham Primary School, staff subject knowledge allows the intentions of our mathematics curriculum to be delivered successfully. We continually strive to build upon the excellent understanding of the expectations of the curriculum that our staff have. We achieve this through regular quality CPD, and targeted teaching support is provided through the subject lead, external courses and collaborative lesson study. All staff are encouraged to raise questions, seek support and request further training if

needed in order to ensure everyone is confident in what they teach. Good practice is shared between staff and all CPD is used to inform and improve teaching and learning across school. Mixed attaining teaching and flexible groupings, centred around pupil's needs, enables the delivery of an empowering inclusive maths curriculum.

Resources and equipment are audited regularly so that children have materials of a high quality to support their learning. Our resources allow us to better use models and images to embed learning in each area and enable the progression from concrete to pictorial to abstract. Children are familiar with these resources and can access them independently.

Our curriculum progression and learning overviews enable children to get to grips with different areas of mathematics for extended periods. The school's curriculum planning for mathematics carefully sequences knowledge, concepts and procedures to build mathematical knowledge and skills systematically and, over time, the curriculum draws connections across different ways of looking at mathematical ideas. Alongside this, we use many other resources to ensure that our offer is rich and varied (these include White Rose, Collins Maths, NCTEM, NRich, and Third Space Learning). Through this approach, the children are exposed to a wide variety of challenges and greater depth understanding therefore ensuring that they apply their fluency, problem solving and reasoning skills in different formats. Our overview provides teachers with a time frame for how long should be spent on topics, however teachers have autonomy within the time frame to decide about when to progress based on the security of pupils' understanding and their readiness to progress to the next stage. The overview has consolidation weeks embedded in order to offer sufficient opportunities to revisit previously learned knowledge, concepts and procedures; this is to ensure that, once learned, mathematical knowledge becomes deeply embedded in pupils' memories. This then allows rapid and accurate recall and frees pupils' attention so they can work with increasing independence, apply their mathematical knowledge to more complex concepts and procedures, and gain enjoyment through a growing self-confidence in their ability.

The school overview and progression documents ensure that all pupils understand and remember the mathematical knowledge, concepts and procedures appropriate for their starting points, including knowledge of efficient algorithms. The overview allows for the curriculum to divide new material into manageable steps lesson by lesson. The pupils who grasp concepts rapidly are challenged through being offered rich and sophisticated reasoning problems before any acceleration through new content. The pupils who are not sufficiently fluent with material consolidate their understanding through additional practice, before moving on. This approach ensures that opportunities are created when mathematical reasoning and solving problems allow pupils to make useful connections between identified mathematical ideas or to anticipate practical problems they are likely to encounter in adult life. Pupils have sufficient understanding of, and unconscious competence in, prerequisite mathematical knowledge, concepts and procedures that are necessary to succeed in the specific tasks set. Teachers implement the schools agreed calculation policies for progression in written and mental calculations. The school mathematics progression documents ensure that correct mathematical vocabulary is used by all teachers and this is discussed with and explained to children who are then encouraged to use it independently when talking about maths. Vocabulary is displayed clearly on working walls and is referred to in every lesson. Timetabled interventions for maths are in place for children with additional needs; all other children receive regular group support as part of their maths lessons with further support for individuals or small groups where a need is identified.

Fluency is developed through repeating, reinforcing and revising key skills; arithmetic is explicitly taught in all year groups. Children are given time to practise and perfect their calculation strategies including giving pupils the opportunity to make appropriate decisions when estimating, calculating and evaluating the effectiveness of their chosen methods. Feedback is given in a variety of ways to ensure pupils are well informed and making visible progress. Discussion is essential to learning and children are encouraged to discuss their thoughts, ideas and methods with a partner, group or the teacher. Task types are varied to suit different pupils and their learning preferences; developing rapid reasoning skills and diving deeper remain areas of key focus. Investigative tasks are designed to allow pupils to follow lines of enquiry and develop their own ideas, justifying and proving their answers. Children work both collaboratively and independently when solving problems which require them to persevere and develop resilience.

Spoken Language and Vocabulary:

The national curriculum of mathematics reflects the importance of spoken language in pupils' development across the whole curriculum (cognitively, socially and linguistically); this is intrinsically

important to the teaching and learning. The quality, variety and accuracy of language the pupils hear and speak are key factors in developing their mathematical vocabulary and presenting their written responses for application activities. They must be assisted in making their thinking clear to themselves as well as others and teachers should ensure pupils build secure foundations by using discussion to probe and remedy their misconceptions. Children are to be expected to answer in full sentences; just as they would in their written responses.

Assessment and Recording:

Formative assessment takes place on a daily basis with teachers assessing children's progress regularly and adapting their teaching to meet the needs of individual children to ensure that all pupils have gained the intended understanding and unconscious competence in knowledge, concepts and procedures necessary. Reviewing prior learning allows teachers to identify any gaps in knowledge, which aspects of learning need to be revisited again and which aspects have been fully mastered before they move on to new or more complex content. Children are given daily Challenges to move their learning further and common misunderstandings or misconceptions are addressed through a tailored Close the Gap activity. When children struggle to meet the Success Criteria, personalised Next Steps are given to pupils. Pupils' progress and reflection is evident in books through the use of the Purple Pen of Progress. Teachers track progress using our school tracker assessment statements consistently across all key stages through our Prove it on Pink assessment in KS2 and Missions in KS1. Testbase tests are used in Autumn, Spring and Summer terms for Yr2-Y5. Testbase assessments are not used for Yr6 as they complete their SATs and Yr1 take part in Testbase Assessment from Spring Term. Teacher observations in EYFS show a range of activities which cover fluency, reasoning and problem solving. Regular pupil progress ECM meetings with SLT allows children to be closely monitored and any child identified as a concern or is making slower rates of progress can be discussed and interventions can be put in place and then reviewed. Teachers know who their pupil premium and SEND children are and ensure appropriate provision is provided. All SEND children either have a tailored SEN support plan or will be included on year group provision maps.

Multiplication Tables Check:

The national curriculum states, 'By the end of year 4, pupils should have memorised their multiplication tables up to and including the 12 multiplication table and show precision and fluency in their work'. At Barham Primary School, we believe that children knowing their times tables is important to mathematical learning and understanding. The reasoning and learning that comes with understanding times tables can be applied across a wide range of topics within mathematics. We aim to take a broader approach to teaching times tables which will maximise children's recall ability; reduce cognitive load, and help children to learn conceptually as well as procedurally. We have adopted a whole school approach to the teaching of time tables, building up facts systematically, exploring patterns, using concrete resources and engaging in activities focusing on practice. We ensure children have opportunities within every lesson to discuss their mathematical thinking and respond to 'What do you notice?' questions, encouraging children to make connections and spot patterns.

Impact: What we achieve by delivering Mathematics in this way and how we know?

Through discussion and feedback, children talk enthusiastically about their maths lessons and speak about how they love learning about maths. Children can articulate the context in which maths is being taught and relate this to real life purposes. Children achieve highly in the subject with a large percentage surpassing age-related expectations. They understand the relevance and importance of what they are learning and make links not only between areas of mathematical learning but to real world concepts.

Children have a positive view of maths due to learning in an environment where maths is promoted as being an exciting and enjoyable subject in which they can investigate and ask questions; they know that it is OK to be 'wrong' and that this strengthens their learning because the journey to finding an answer is most important. Lessons use a variety of resources to support children's learning and includes different representations of mathematical concepts. Children are confident to 'have a go' and choose the equipment they need to help them to learn along with the strategies they think are best suited to each problem. Our children have an in-depth understanding of their strengths and targets for development in maths and what they need to do to improve it through daily conversations with teachers and looking back at their personalised target sheets in their maths books.

Our maths books evidence work of a high standard of which children clearly take pride; the range of activities demonstrate excellent coverage of fluency, reasoning and problem solving. Work in books and regular ongoing assessment is used as a measure of progress towards the identified end points. Pupils are given regular opportunities to recap and embed learning as well as applying their knowledge to solve a range of tasks and problems. Where gaps in learning are identified, the reasons for this are analysed and this information is used to plan further teaching or intervention activities where needed.

SEND:

Some children will require extra support, either during or after lessons, to enable them to master certain concepts or elements. This should be carried out immediately to allow the children to access the next lesson to “keep up”, rather than “catch up”. Teachers provide those children with SEND with the skills and knowledge they need by direct instruction, progressing systematically with carefully structured, small and cumulative steps

Monitoring:

Monitoring takes place regularly through sampling children’s work, pupil and staff voice, teacher planning, book scrutiny, learning walks and lesson visits. Strengths and areas of development are identified and support is provided by the mathematics team where necessary.