

Frimley Church of England School

Maths - Skills and Knowledge Progression



Intent

At Frimley, enjoyment of Maths is paramount. Through a rich mathematical curriculum, pupils will have opportunities to learn, develop and apply mental methods to progress their attainment in fluency, problem solving and reasoning. Mathematics here is challenging, exciting, creative and engaging, with children developing a positive and confident attitude towards the subject. Fluency, problem solving and reasoning are at the heart of our teaching; ensuring children develop greater understanding of mathematical concepts. Our approach to maths is investigative with a focus on Mastery and children are encouraged to shape their own learning, asking questions and developing their own lines of enquiry. Teaching is active and relevant and is well supported by a range of resources such as MyMaths, TT Rockstars, Active Maths, Nrich and concrete apparatus.

Implementation

Careful planning makes sure that all children are able to access every lesson; children are supported fluidly or extended appropriately to enable all children to never reach the ceiling on their own, personalised learning. Progression is planned carefully with small step learning, ensuring that children make links to prior learning building on previous experiences, whilst ensuring full coverage of the National Curriculum objectives. This means children leave us fully prepared for their next steps on their learning journey and can apply maths to real life situations. Focus on the Frimley Learner attributes and applying skills to learning will encourage children to develop resilience and perseverance in their learning, particularly with problem solving and reasoning. A greater importance is being placed on MyMaths and TT Rockstars to inspire children to access these sites as a means of enjoyment as well as home-learning. Rock star of the month will be selected for each year group and announced in assembly with their photos being displayed on the maths board in the hall. The profile of maths will continue to rise through the academic year; maths competitions have been entered and children across the school will be given the opportunity to attend these.

Impact

- Children will enjoy maths and strive to achieve more.
- The percentage of children achieving age related expectations or higher by the end of the academic year will increase. All children will have the view that there is no ceiling to their learning.
- Children will be more confident, resilient and persevere to attempt and achieve problem solving tasks.
- Children will have a deep understanding of the methodology in maths and be able to explain their understanding. This will develop children's reasoning and problem solving skills.
- Children will understand the important of times tables and number bonds and majority of children will be able to recall all times tables by the end of year 4.
- Mental methods will be embedded and be independently applied to solve challenging problems.



- Children will be actively engaged in representing the school in mathematical competitions.

National curriculum expectations:

Mathematics is a creative and highly inter-connected discipline that has been developed over centuries, providing the solution to some of history’s most intriguing problems. It is essential to everyday life, critical to science, technology and engineering, and necessary for financial literacy and most forms of employment. A high-quality mathematics education therefore provides a foundation for understanding the world, the ability to reason mathematically, an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject. By the end of key stage 2, pupils are expected to know, apply and understand the matters, skills and processes as specified in the document below.

Pupils should be taught:

- To become fluent in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
- To reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language.
- To solve problems by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

What Frimley offers to its pupils:

	Year 3	Year 4	Year 5	Year 6
Core Knowledge	<ul style="list-style-type: none"> • Number and place value • Addition and subtraction • Multiplication and division • Fractions • Measurement • Geometry – properties of shape • Statistics 	<ul style="list-style-type: none"> • Number and place value • Addition and subtraction • Multiplication and division • Fractions (including decimals) • Measurement • Geometry – properties of shape • Geometry – position and direction • Statistics 	<ul style="list-style-type: none"> • Number and place value • Addition and subtraction • Multiplication and division • Fractions (including decimals and percentages) • Measurement • Geometry – properties of shape • Geometry – position and direction 	<ul style="list-style-type: none"> • Number and place value • Addition and subtraction • Multiplication and division • Fractions (including decimals and percentages) • Measurement • Geometry – properties of shape • Geometry – position and direction
Number and Place value	<ul style="list-style-type: none"> • Count from 0 in multiples of 4, 8, 50 and 100 • Find 10 or 100 more or less than a given number • Recognise the place value of each digit in a three digit number • Compare and order numbers up to 1000. 	<ul style="list-style-type: none"> • Numbers up to 4 digits • Introduction to decimals • Find 1000 more or less than a given number. Count backwards through and past zero • Round to the nearest 10, 100 or 1000 & solve problems • Roman numerals to 100 	<ul style="list-style-type: none"> • Numbers up to 1,000,000 • Count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000 • Problems involving negative numbers • Round to the nearest 10 000 and 100 000 	<ul style="list-style-type: none"> • Numbers up to 10 000 000

	<ul style="list-style-type: none"> Identify, represent and estimate numbers using different representations. Read and write numbers up to 1000 in numerals and in words. Solve problems 		<ul style="list-style-type: none"> Roman numerals to 1000 and recognise years Prime numbers, prime factors and composite 	
Addition and subtraction	<ul style="list-style-type: none"> Add and subtract numbers mentally, including: <ul style="list-style-type: none"> a three-digit number and ones a three-digit number and tens. a three-digit number and hundreds Columnar addition and subtraction – up to 3 digits Estimate the answer to a calculation and use inverse operations to check answers Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction 	<ul style="list-style-type: none"> Add and subtract numbers with up to 4 digits 2 step +/- problems deciding which operations & methods to use/ why 	<ul style="list-style-type: none"> Add and subtract whole numbers with more than 4 digits (and mentally) 	<ul style="list-style-type: none"> BIDMAS
Multiplication and Division	<ul style="list-style-type: none"> Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables. Use \times, \div and $=$ to write statements Multiplication of two-digit numbers times one-digit numbers, using mental and progressing to formal written methods. Recognise odd and even numbers Solve problems, including missing number problems, involving multiplication and division. 	<ul style="list-style-type: none"> Count in multiples of 6,7,9,25,1000 Find the effect of dividing a one- or two-digit number by 10 and 100 Multiplication and division facts up to 12×12 Multiplying together three numbers Factor pairs Multiply 3-digit numbers by a 1-digit Harder correspondence problems such as n objects are connected to m objects 	<ul style="list-style-type: none"> Multiply numbers up to 4 digits by a one- or two digit Divide numbers up to 4 digits by a one-digit number Multiply and divide decimal numbers by 10, 100 and 1000 Squared and cubed numbers Common factors of two numbers Multi-step problems 	<ul style="list-style-type: none"> Multiply one-digit numbers with up to two decimal places by whole numbers Multiply multi-digit numbers up to 4 digits (long multiplication) Short and long division 4 divided by 2 digits (with decimals) Interpret remainders to context Use estimation to check answers to calculations BIDMAS
Fractions, Decimals and Percentages	<ul style="list-style-type: none"> Count up and down in tenths; Recognise, find and write and use fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators Recognise and show, using diagrams, equivalent fractions with small denominators 	<ul style="list-style-type: none"> Common equivalent fractions Count up and down in hundredths Recognise and write decimal equivalents of any number of tenths or hundredths Recognise and write decimal equivalents to $1/4$, $1/2$ and $3/4$ 	<ul style="list-style-type: none"> Scaling by simple fractions and problems involving simple rates Compare, order, add and subtract fractions with the same multiple denominators Convert mixed numbers and improper fractions 	<ul style="list-style-type: none"> Fraction, decimal and percentage equivalences Use common factors to simplify fractions Compare and order fractions > 1 Add and mixed numbers

	<ul style="list-style-type: none"> • Add and subtract fractions with the same denominator <1 • Compare and order unit fractions, and fractions with the same denominators. • Solve problems that involve all of the above. 	<ul style="list-style-type: none"> • Solve simple measure and money problems involving fractions and decimals to two decimal places • Round decimals with 1dp to the nearest whole number 	<ul style="list-style-type: none"> • Multiply proper fractions and mixed numbers by whole numbers • Equivalences between tenths, hundredths and thousandths • Read, write, order and compare 3dp • Decimal/ percentage equivalences 	<ul style="list-style-type: none"> • Multiply simple pairs of proper fractions • Divide proper fractions by whole numbers
Measurement	<ul style="list-style-type: none"> • Measure, compare, add and subtract metric measures. • Measure the perimeter of simple 2-D shapes. • Add and subtract amounts of money to give change, using both £ and p • Tell and write the time from an analogue clock with accuracy of minutes including using Roman numerals from I to XII, and 12-hour and 24-hour clocks • Record and compare time in terms of seconds, minutes and hours • Use vocabulary such as o'clock, a.m/p.m., morning, afternoon, noon and midnight • Know the number of seconds in a minute and the number of days in each month, year and leap year • Compare durations of events 	<ul style="list-style-type: none"> • Convert between different units of measure • Measure and calculate the perimeter of a rectilinear figure • Compare and calculate different measures, including money 	<ul style="list-style-type: none"> • Metric and imperial units • Calculate and compare the area of rectangles • Volume • Converting between units of time • Use all four operations using decimal notation 	<ul style="list-style-type: none"> • Convert between miles and kilometres • Same areas can have different perimeters and vice versa • Formulae for area and volume of shapes • Area of parallelograms and triangles
Geometry	<ul style="list-style-type: none"> • Draw 2-D shapes and make 3-D shapes using modelling materials • Recognise 3-D shapes in different orientations and describe them. • Recognise angles as a property of shape or a description of a turn. • Identify right angles and discuss rotation in terms of '1/4 turns' etc. • Identify whether angles are greater than or less than a right angle. • Identify horizontal and vertical lines and pairs of perpendicular and parallel lines. 	<ul style="list-style-type: none"> • Geometry – position and direction • Plot points and draw sides to complete a given polygon • Describe positions on a 2- D grid • Translations • Complete a simple symmetric figure with respect to a specific line of symmetry 	<ul style="list-style-type: none"> • Estimate and compare angles in degrees • Draw and measure angles in degrees • Use the properties of rectangles to deduce related facts • Distinguish between regular and irregular polygons based on reasoning 	<ul style="list-style-type: none"> • Make nets • Calculate angles in any triangles, quadrilaterals, and regular polygons (and missing angles) • Illustrate and name parts of circles

Statistics	<ul style="list-style-type: none"> • Interpret and present data using bar charts, pictograms and tables • Solve one-step and two step questions using information presented in scaled bar charts and pictograms and tables. 		<ul style="list-style-type: none"> • Introducing a line graph • Complete, read and interpret information on timetables 	<ul style="list-style-type: none"> • Interpret and construct pie charts • Calculate and interpret the mean
Ratio & proportion				<ul style="list-style-type: none"> • Ratio and proportion
Algebra				<ul style="list-style-type: none"> • Algebra
Skills	<ul style="list-style-type: none"> - Collaboration - Problem solving - Reasoning - Comparing - Applying - Handling money and calculating change - Calculating with the four operations - Telling the time - Reading tables and charts - Represent data visually - Make comparison between equivalences - Accuracy with measure - Estimating 	<ul style="list-style-type: none"> - Collaboration - Problem solving - Reasoning - Comparing - Applying - Handling money - Calculating with the four operations - Telling the time - Reading tables and charts - Represent data visually - Make comparison between equivalences - Accuracy with measure - Estimating 	<ul style="list-style-type: none"> - Collaboration - Problem solving - Analysing - Reasoning - Interpreting - Comparing - Calculations with money – life skills - Calculating with the four operations - Solving problems with time - Reading timetables, tables and charts - Represent data visually - Make comparison between equivalences - Accuracy with measure - Estimating 	<ul style="list-style-type: none"> - Collaboration - Problem solving - Analysing - Reasoning - Interpreting - Comparing - Calculating with the four operations - Calculating sales (%) - Reading timetables, tables and charts - Represent data visually - Make comparison between equivalences - Accuracy with measure - Estimating