

Mathematics

National Curriculum Programme of Study

'Mathematics is a creative and highly interconnected 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.'

Our curriculum for mathematics aims to ensure that all pupils:

- become fluent in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils can develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately;*
- reason mathematically by following a line of enquiry conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language*
- can 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.*

Mathematics is an interconnected subject in which pupils need to be able to move fluently between representations of mathematical ideas. The programmes of study are, by necessity, organised into apparently distinct domains, but pupils should make rich connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems. They should also apply their mathematical knowledge to science and other subjects and disciplines.

Key Knowledge and Skills

Number

- **Place value**
 - Numbers to 10,000,000.
 - Read and write numbers to 10,000,000.
 - Powers of 10.
 - Compare, order and round any integer.
 - Negative numbers.
- **Addition, subtraction, multiplication and division**
 - Add and subtract integers.
 - Common factors.
 - Common multiples.
 - Rules of divisibility.
 - Prime numbers to 100.
 - Square and cube numbers.
 - Multiply up to a 4-digit number by a 2-digit number.
 - Short and long division - with and without remainders.
 - Solve problems with multiplication and with division.
 - Order of operations.
 - Mental calculations and estimation.
 - Reason from known facts.
- **Fractions**
 - Equivalent fractions and simplifying.
 - Compare and order fractions.
 - Add and subtract any two fractions.
 - Add and subtract mixed numbers.
 - Multiply fractions by integers and by fractions.
 - Divide any fraction by an integer.
 - Find fractions of amounts,
 - Find the whole given a fraction of an amount.
- **Ratios**
 - Using ratio language.
 - The ratio symbol.
 - Ratio and fractions.
 - Calculating ratio.
 - Scale drawing.
 - Using scale factors.
 - Similar shapes.

Measures

- **Converting units**
 - Metric measures
 - Convert metric measures.
 - Calculate with metric measures.
 - Miles and kilometres.
 - Imperial measures.

Year 6 - Spring Term

Key Knowledge and Skills

Algebra

- **Introduction to algebra**
 - 1-step function machines.
 - 2-step function machines.
 - Forming expressions.
 - Substitution.
 - Using and forming equations and formulae.
 - Solve one-step and two-step equations.
 - Find pairs of values.
 - Solve problems with two unknowns.

Geometry

- **Area and volume**
 - Shapes with the same area.
 - Area and perimeter.
 - Areas of triangles - including counting squares.
 - Area of parallelograms.
 - Volume of cuboids - including counting cubes.
- **Properties of shapes**
 - Measure with a protractor.
 - Calculate angles.
 - Vertically opposite angles.
 - Angles in a triangle.
 - Angles in special quadrilaterals.
 - Angles in regular polygons.
 - Draw 2-D shapes accurately.
 - Draw nets of 3-D shapes.

Number

- **Decimals**
 - Place value within 1.
 - Round decimals.
 - Add and subtract decimals.
 - Multiply and divide by 10, 100 and 1000.
 - Multiply and divide decimals by integers.
 - Multiply and divide decimals in context.
- **Percentages**
 - Decimal and fraction equivalents.
 - Fractions as division.
 - Understand percentages.
 - Fractions to percentages.
 - Equivalent fractions, decimals and percentages.
 - Order fractions, decimals and percentages.
 - Percentages of amounts.
 - Missing value percentage problems.

Statistics

- Line graphs.
- Dual bar charts.
- Read and interpret pie charts, including those with percentages.
- Use line graphs to solve problems.
- Draw pie charts.
- Find the mean.

Year 6 - Summer Term

Key Knowledge and Skills

Geometry

- **Properties of shapes**
 - *Continued from last term.*
- **Position and direction**
 - Coordinates in the first quadrant and all four quadrants.
 - Translations of shapes.
 - Reflections of shapes.

Projects and consolidation

Enrichment and Home Learning

- Dr Frost Maths Homework (DFM): Weekly home learning tasks and optional challenges
- Times Table Rock Stars (TTRS): Weekly time to be completed