Mathematics Curriculum Implementation

Key Stage 2	Year 7	Year 8	Year 9	Year 10	Year 11

Key Stage 2

Purpose of study

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.

Aims

The national 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 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 nonroutine 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. The expectation is that the majority of pupils will move through the programmes of study at broadly the same pace. However, decisions about when to progress should always be based on the security of pupils' understanding and their readiness to progress to the next stage. Pupils who grasp concepts rapidly should be challenged through being offered rich and sophisticated problems before any acceleration through new content. Those who are not sufficiently fluent with earlier material should consolidate their understanding, including through additional practice, before moving on.

The principal focus of mathematics teaching in upper **key stage 2** is to ensure that pupils 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. At this stage, 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. Teaching should also ensure that pupils classify shapes with increasingly complex geometric properties and that they learn the 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.

Year 7

Term 1
Algebraic Thinking (A)
Sequences
Understand and Use Algebraic Notation
Equality and Equivalence
Place Value and Proportion (R)
Place Value
Ordering Integers and decimals
Fraction, Decimal, Percentage Equivalence

Cultural Exposure:
Modelling, Reasoning, discussions, interpreting and understanding real life data, questions in real life contexts and STEM

Term 2
Application of Number (N)
Solving Problems :Addition and Subtraction, Multiplication and Division
Fractions and Percentages of Amounts
Directed Number (N)
Four Operations
Fractional Thinking (N)
Addition and Subtraction of Fractions

Cultural Exposure:
Modelling, Reasoning, discussions, interpreting and understanding real life data, questions in real life contexts and STEM

Term 3
Lines and Angles (G)
Constructing, Measuring and Using Geometric notation
Developing Geometric Reasoning
Reasoning With Number (N)
Developing Number Sense
Sets and Probability (P)
Prime Numbers and Proof

Cultural Exposure:
Modelling, Reasoning, discussions, interpreting and understanding real life data, questions in real life contexts and STEM

Assessment

Post Topic Assessments

Termly Assessments based on prior learning

Year 8

Term 1
Proportional Reasoning (R)
Ratio and Scale
Multiplicative Change
Multiplying and Dividing Fractions
Representations
Working in the Cartesian Plane (A)
Representing Data (S)
Tables and Probability (P)

Cultural Exposure:
Modelling, Reasoning, discussions, interpreting and understanding real life data, questions in real life contexts and STEM

Term 2
Algebraic Techniques (A)
Brackets Equations and Inequalities
Sequences
Indices
Developing Number (N)
Fractions and Percentages
Standard Index Form
Number Sense

Cultural Exposure:
Modelling, Reasoning, discussions, interpreting and understanding real life data, questions in real life contexts and STEM

Term 3
Developing Geometry (G)
Angles in Parallel Lines and Polygons
Area of Trapezia and Circles
Line Symmetry and Reflection
Reasoning with Data (S)
The Data Handling Cycle
Measures of Location

Cultural Exposure:
Modelling, Reasoning, discussions, interpreting and understanding real life data, questions in real life contexts and STEM

Assessment

Post Topic Assessments

Termly Assessments based on prior learning

Year 9

Term 1
Reasoning With Algebra (A)
Straight Line Graphs
Forming and Solving Equations
Testing Conjectures
Constructing in 2 and 3 Dimensions (G)
Three Dimensional Shapes
Constructions and Congruency

Cultural Exposure:
Modelling, Reasoning, discussions, interpreting and understanding real life data, questions in real life contexts and STEM

Term 2
Reasoning With Number (N)
Numbers
Using Percentages
Maths and Money
Reasoning With Geometry (G)
Deduction
Rotation and Translation
Pythagoras' Theorem

Cultural Exposure:
Modelling, Reasoning, discussions, interpreting and understanding real life data, questions in real life contexts and STEM

Term 3
Reasoning With Proportion (R)
Enlargement and Similarity
Solving Ratio and Proportion Problems
Rates
Representations (A)
Solving Problems Using Graphs, Tables and Algebra

Cultural Exposure:
Modelling, Reasoning, discussions, interpreting and understanding real life data, questions in real life contexts and STEM

Assessment

Post Topic Assessments

Termly Assessments based on prior learning

Year 10

Term 1
Similarity (G)
Congruence, Similarity and Enlargement
Trigonometry
Developing Algebra (A)
Representing Solutions of Equations and Inequalities
Simultaneous Equations

Cultural Exposure:
Modelling, Reasoning, discussions, interpreting and understanding real life data, questions in real life contexts and STEM

Term 2
Geometry (G)
Angles and Bearings
Working with Circles
Vectors.
Proportion and Proportional Change
Ratio and Fractions (R)
Percentages and Interest
Probability (P)

Cultural Exposure:
Modelling, Reasoning, discussions, interpreting and understanding real life data, questions in real life contexts and STEM

Term 3
Delving into Data (S)
Collecting, Representing and Interpreting Data
Using Number (N)
Non-calculator Methods
Types of Number and Sequences
Indices and Roots

Cultural Exposure:
Modelling, Reasoning, discussions, interpreting and understanding real life data, questions in real life contexts and STEM

Assessment

Post Topic Assessments

Termly Assessments using GCSE Papers (the Summer assessment as a Mock in the Gym / Drama Hall)

Year 11

Term 1
Graphs (A)
Gradients and Lines
Non-linear Graphs
Using Graphs
Algebra (A)
Expanding and Factorising
Changing the Subject
Functions

Cultural Exposure:
Modelling, Reasoning, discussions, interpreting and understanding real life data, questions in real life contexts and STEM

Term 2
Reasoning
Multiplicative Reasoning (R)
Geometric Reasoning (G)
Algebraic Reasoning (A)
Revision and Communication
Transforming and Constructing (G)
Listing and Describing (P)
Show that...

Cultural Exposure:
Modelling, Reasoning, discussions, interpreting and understanding real life data, questions in real life contexts and STEM

Term 3

Revision

Cultural Exposure:

Assessment

Post Topic Assessments

2 Mock Exams

Practice papers in class /homework

National Curriculum Coverage : Number (N), Algebra (A), Ratio and Proportion (R), Geometry and Measures (G), Probability (P), Statistics (S)