Year 6 Maths

Organisation

Year 6 pupils are taught in ability sets for Maths. A small group of pupils who find Maths particularly challenging are taught in a small extra support group. The average set size is 24 pupils. Flexibility is built into the setting arrangements which are reviewed frequently. Pupils are not told the order of the sets, but simply that they are in the right set for them. Work is differentiated within all sets as pace and challenge are extremely important at every level. Mathematics accounts for 6 lessons each week.

Scheme of Work

The year 6 Programme of Study at Robert Bloomfield is divided into units of work each lasting between 5 - 10 lessons. It is important that each unit is not seen as an isolated block as connections and links between them are essential. There is a spiral progression in that pupils revisit concepts across the year and from year to year to recap, reinforce and then extend their knowledge, skills and understanding. Below is a summary of each unit illustrating the main objectives to be covered. All sets across a year group cover the same topics, at a similar time, but at the appropriate level. This is only a guide as continuous teaching and review informs the planning and coverage of future lessons.

Summary of Year 6 Units

Number 1 Place Value, Addition and Subtraction

- Solve multi-step addition and subtraction problems in less familiar contexts
- Consolidate adding and subtracting whole numbers with more than 4 digits, including using formal written columnar addition and subtraction
- Read and write numbers to 10 000 000 and determine the value of digits
- Order and compare numbers up to 10 000 000
- Round whole numbers to 10 000 000 to a required degree of accuracy

Number 2 Multiplication and Division

- Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication
- Divide numbers up to 4 digits by a two-digit whole number using the formal methods of short or long division, Interpret remainders as appropriate for the context as whole numbers, fractions or by rounding

Number 3 Fractions, Decimals and Percentages

- Identify the value of each digit in numbers given to three decimal places
- Multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places
- Calculate decimal fraction equivalents for a simple fraction
- Use written division methods in cases where the answer has up to two decimal places
- Multiply numbers with up to two decimal places by whole numbers
- Solve problems which require decimal answers to be rounded to specified degrees of accuracy
- Consolidate understanding of equivalent fractions by extending to improper fractions
- Use common factors to simplify fractions
- Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts

Number 4 & Algebra 1 Types of Number and Algebra

- Consolidate knowledge of multiples and factors, including all factor pairs of a number, and common factors of two numbers
- Consolidate understanding of square numbers and cube numbers and the notation for them
- Calculate intervals across zero
- Use negative numbers in context
- Add and subtract positive and negative measurements such as temperature
- Read Roman numerals to 1000 (M) and recognising years written in Roman numerals
- Express missing number problems algebraically
- Use simple formulae
- Generate and describe linear number sequences
- Begin to understand the conventions of algebraic notation

Number 5 Number Problems

- Use knowledge of the order of operations
- Perform mental calculations, including with mixed operations and large numbers
- Consolidate solving problems using more than one of the four operations
- Solve multi-step calculation problems involving combinations of all four operations
- Check answers to calculations with mixed operations and large numbers

Number 6 Fractions, Percentages, Ratio and Proportion

- Solve problems involving unequal sharing and grouping
- Compare and order fractions, including fractions > 1
- Add and subtract fractions with different denominators and mixed numbers
- Multiply simple pairs of proper fractions
- Divide proper fractions by whole numbers
- Multiply a quantity that represents a unit fraction to find the whole quantity
- Solve problems involving the calculation of percentages and the use of percentages for comparison

Geometry 1 (2D Shape)

- Draw 2-D shapes accurately using given dimensions and angles
- Compare and classify geometric shapes based on increasingly complex geometric properties and sizes
- Find unknown angles and lengths in triangles, quadrilaterals, and regular polygons
- Identify line and rotational symmetry in 2D shapes

Measurement 3 (Area / Perimeter)

- Consolidate skills in calculating perimeter
- Calculate the area of parallelograms and triangles

Measurement 1 (Measures) & Measurement 2 (Time)

- Use, read and write standard units with up to three decimal places
- Convert from smaller to larger units and vice versa
- Measure and compare using different standard units of measure
- Solve measurement problems with decimal notation up to three decimal places.
- To know and use approximate equivalences between metric and imperial measurements to solve problems
- Consolidate fluency in working with time
- Consolidate skills in solving problems converting between units of time

Geometry 2 (3D Shape) & Measurement 3 (Volume)

- Build simple 3-D shapes, including making nets
- Recognise 3-D shapes from their nets
- Draw and interpret 2D representations of 3D shapes.
- Calculate and compare volume of cubes and cuboids

Geometry 3 Angles

- Recognise angles where they meet at a point, are on a straight line, or are vertically opposite
- Find and check solutions to missing angle problems
- Measure and draw angles to the nearest degree

Geometry 4 Co-ordinates & Transformations

- Use positions on the full coordinate grid (all four quadrants)
- Draw and label rectangles, parallelograms and rhombuses specified by coordinates in the four quadrants
- Draw and translate simple shapes on the coordinate plane
- Draw and reflect simple shapes in the axes on the coordinate plane
- Rotate a simple shape or object about a centre of rotation
- Reflect a shape in a horizontal, vertical or diagonal mirror line.

Statistics 1 Analysing, Presenting & Interpreting Data

- Present data using pie charts and line graphs
- Extract and interpret information presented in a range of tables, lists and graphs
- Use Venn and Carroll diagrams to record their sorting and classifying of information

Statistics 1 Analysing, Presenting & Interpreting Data

- Interpret data in pie charts and line graphs
- Consolidate skills in interpreting more complex tables, including two way tables
- Solve problems using pie charts and line graphs
- Calculate and interpret the mean as an average
- Use and understand the mode, median and range

Post SATs

Using and Applying Mathematics / Investigations

• To use their own strategies within mathematics and in applying mathematics to practical contexts
• To try different approaches and find ways of overcoming difficulties that arise when they are solving problems
• To begin to represent their work using symbols and simple diagrams
• To begin to explain reasoning using mathematical terms
• To search for a solution by trying out ideas of their own
• To present information and results in a clear and organised way
• To identify and obtain necessary information to carry through a task and solve mathematical problems
• To show understanding of situations by describing them mathematically using symbols, words and diagrams
• To draw simple conclusions of their own and give an explanation of their reasoning

Introducing Algebra

- To use letters to stand for a variable.
- To understand and use the concepts and vocabulary of expressions, equations, formulae and terms.
- To use and interpret algebraic notation, including: ab in place of a × b, 3y in place of y + y + y and 3 × y, a^2 in place of a × a, a^3 in place of a × a × a, a/b in place of a ÷ b, brackets.
- To simplify and manipulate algebraic expressions by collecting like terms and multiplying a single term over a bracket.
- To interpret simple expressions as functions with inputs and outputs.
- To substitute positive numerical values into formulae and expressions.
- To solve simple equations using the inverse function machines and balancing method (Positive whole number solutions)
- To understand and use BIDMAS for the order / priority of operations

Negative Numbers

- To use and understand negative number in appropriate contexts.
- To understand movements along the number line including crossing zero
- To add and subtract positive and negative numbers (giving pupils mental images not just rules to try to remember!)
- To multiply and divide positive and negative numbers
- To use negative numbers with a scientific calculator
- To substitute negative numbers into algebraic expressions

Probability

- To understand and use the vocabulary of probability to express likelihood.
- To understand and use the probability scale from 0 to 1.
- To understand that different outcomes may result from repeating an experiment.
- To calculate the probability of an event by listing all the equally likely outcomes.
- To know that the sum of probabilities of all mutually exclusive outcomes is 1 and use this when solving problems.
- To understand the difference between experimental and theoretical probabilities.

Statistics

- To design a questionnaire and collect appropriate data
- To decide the best way to present given data and draw conclusions
- To present and interpret data using pie charts and line graphs
- To complete and interpret tables, including timetables and two way tables
- To use Venn and Carroll diagrams to record their sorting and classifying of information
- To understand , use and calculate measures of average (Mode, Median and Mean)

Homework

Homework is vital and is set once each week to consolidate class work and skills and/or increase inquisitiveness in mathematics.