Year 6 Mathematics Curriculum Overview

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 non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions

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Autumn Term

Topic	Skills
Number - Number and place value	• Read and write seven-digit numbers • Identify the value of each digit in a seven-digit number • Use the value of the digits to compare and order numbers • Round any whole number to the required degree of accuracy
Number - Addition and subtraction	• Add a multiple of 10, 100 or 1000, 10 000, 100 000 from a six- or seven-digit number • Subtract a multiple of 10, 100 or 1000, 10 000, 100 000 from an even six- or seven-digit number • Add and subtract decimals with both one or two decimal places • Add and subtract decimals a combination of one or two decimal places
Geometry - Properties of shape	• Recognise, describe and build simple 3-D shapes • Use knowledge of the properties of cubes to identify and draw different nets of cubes • Use knowledge of the properties of cubes and cuboids to construct nets of a cube and a cuboid • Construct the nets of a tetrahedron, an octahedron and a square-based pyramid
Number - Multiplication and division	• Make a reasonable estimate of the answer to a calculation and use this to check the answer • Use a written method to calculate multiplication of ThHTO x O • Use a written method to calculate multiplication of TO xTO
Number - Fractions	• Recognise common factors and common multiples • Simplify fractions by cancelling common factors • Identify and create equivalent fractions • Order a set of fractions by converting them to fractions with a common denominator • Add and subtract fractions with different denominators and mixed numbers
Geometry- Position and direction	• Use coordinates to describe the positions of shapes in all four quadrants • Plot and label rectangles, squares, parallelograms and rhombuses in all four quadrants • Use the properties of shapes to predict missing coordinates • Translate shapes into all four quadrants using coordinates • Use the properties of shapes to predict missing coordinates • Use coordinates to reflect shapes in the axes into all four quadrants
Number - Addition and subtraction	• Add six- seven-digit numbers using the formal written method of columnar addition • Subtract six- seven-digit numbers using the formal written method of columnar subtraction

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	• Add numbers with up to two decimal places using the formal written method of columnar addition • Subtract numbers with up to two decimal places using the formal written method of columnar subtraction • Estimate and check the answer to a calculation
Number - Decimals	• Identify the value of each digit in numbers with three decimal places • Multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places • Multiply decimals by whole numbers, using and applying known multiplication tables, and in the context of measures and money • Solve problems which require the answer to be rounded to specified degrees of accuracy
Measurement - Length	• Convert from one unit of length to another, using decimal notation up to three decimal places where appropriate • Calculate and convert between standard units of length to solve problems • Convert and make approximate conversions between miles and kilometres • Interpret a miles to kilometres graph
Number - Multiplication and division	• Identify common factors and common multiples • Make a reasonable estimate of the answer to a calculation and use this to check the answer • Use the formal method of short division to calculate ThHTO ÷ 0, ThHTO ÷ 11 and ThHTO ÷ 12 • Express a remainder in a division calculation as a whole number, a fraction or a decimal • Determine whether to round up or down a remainder in a division calculation according to the context
Number – Fractions (including decimals and percentages)	• Associate a fraction with division • Calculate decimal fraction equivalents • Recall equivalences between simple fractions, decimals and percentages • Solve problems involving the calculation of percentages
Measurement (time)	• Convert from smaller to larger standard units of time and vice versa • Calculate and convert between standard units of time to solve problems • Calculate the average speed of a journey in kilometres per hour and in miles per hour • Calculate the average speed of travel using a range of compound units • Apply the calculation of speed to subjects such as science

Spring Term

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Topic	Skills
Number _ Addition, subtraction, multiplication and division, including Number and place value	• Use negative numbers in context, and calculate intervals across zero • Perform mental calculations, including with mixed operations and large numbers • Understand the order of operations and use the BODMAS rule to carry out calculations involving the four operations and brackets • Practise addition and subtraction for larger numbers, including both mental and written methods
Algebra	• Solve simple formulae for given values • Generate a simple formula to fit a problem • Substitute values into a simple formula • Continue or complete linear number sequences • Describe and calculate the nth term of a number sequence • Construct an algebraic formula for a problem in words and then symbols • Find solutions to equations involving two unknowns using a suitable strategy • List possible answers for combinations of two variables using a systematic approach
Geometry - Properties of shape	• Draw 2-D shapes using given dimensions and angles • Use measuring tools and conventional markings and labels for lines and angles • Use properties and sizes to compare and classify geometric shapes • Find unknown angles in triangles, quadrilaterals and regular polygons • Identify and name angles where they are vertically opposite • Identify and name angles where they meet at a point, are on a straight line, or are vertically opposite • Find missing angles expressing relationships algebraically, e.g. $a = 180 - (b + c)$
Number - Multiplication and division	• Make a reasonable estimate of the answer to a calculation and use this to check the answer • Use a written method to calculate multiplication of HTO × TO
Number _ Multiplication and division, including Decimals	• Make a reasonable estimate of the answer to a calculation and use this to check the answer • Use mental methods to multiply a number with up to two decimal places by a one-digit whole number, e.g. 0· 4 × 2 and 0· 06 × 6 • Multiply one- or two-digit numbers with up to two decimal places by a one-digit whole number using a written method, e.g. 7· 56 × 3 and 35· 4 × 5
Measurement (mass)	• Convert from one unit of mass to another, using decimal notation up to three decimal places where

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	appropriate • Calculate and convert between grams and kilograms to solve problems involving mass
Number - Fractions	• Recognise common factors and common multiples • Identify and create equivalent fractions • Add and subtract fractions with different denominators and mixed numbers • Divide proper fractions by whole numbers • Multiply simple pairs of proper fractions • Simplify fractions by cancelling common factors
Ratio and Proportion	• Find a proportion of a quantity and solve proportion problems • Reduce fractions to the simplest form • Understand ratio and use ratio notation • Simplify ratios to find the simplest form • Use multiples to find missing quantities • Solve shape problems involving scale factors • Divide a quantity into two parts in a given ratio • Solve multi-step problems involving unequal sharing and grouping using knowledge of fractions and multiples
Statistics	• Interpret and construct pie charts and use pie charts to solve problems • Interpret and construct line graphs and use line graphs to solve problems • Draw graphs relating two variables • Collect, organise and interpret data from an enquiry to solve a problem • Calculate and interpret the mean as an average
Number - Multiplication and division	• Make a reasonable estimate of the answer to a calculation and use this to check the answer • Use a written method of long division (expanded or formal) to calculate division of HTO ÷ TO and ThHTO ÷ TO • Express a remainder in a division calculation as a fraction in its simplest form
Multiplication and Division (including decimals)	• Make a reasonable estimate of the answer to a calculation and use this to check the answer • Use mental methods to divide a number with up to two decimal places by a one-digit whole number, e.g. 6· 4 ÷ 8, 32· 4 ÷ 4 and 6· 39 ÷ 3 • Divide a number with up to two decimal places by a one-digit number using the formal written method of

	short division, e.g. 26· 6 ÷ 6 and 4· 68 ÷ 9 • Divide a number with up to two decimal places by a two-digit number using the expanded or formal written method of long division, e.g. 58· 32 ÷ 18
Measurement (perimeter and area)	• Identify shapes that have the same perimeter but have different areas • Identify shapes that have the same area but have different perimeters • Use the formula for area of rectangles and squares to calculate the surface area of cubes and cuboids • Calculate the area of a triangle using the rule $A = 1/2bh$ • Relate the dissection of a rectangle to the area of a triangle • Calculate the area of a parallelogram using the rule $A = bh$ • Relate the dissection of a rectangle to the area of a parallelogram

Summer Term

Topic	Skills
Number - Addition and subtraction, Multiplication and division	• Perform mental calculations, including with mixed operations and large numbers • Practise addition and subtraction with whole numbers and decimals, including the formal written methods of columnar addition and subtraction • Understand the order of operations and use the BODMAS rule to carry out calculations involving the four operations and brackets
Algebra	• Solve simple formulae for given values and generate a simple formula to fit a problem • Generate and describe number sequences and find a value for the nth term • Substitute values in formulae to solve problems • Draw line graphs for a given equation • Construct an algebraic formula for a problem in words and then symbols • Manipulate equations, collecting like terms and multiplying out brackets • Approach problems systematically and logically to find solutions
Geometry - Properties of shape	• Name the parts of a circle • Use the rule $d = 2r$ to calculate the diameter or the radius of a circle • Use compasses to draw circles and construct a regular hexagon within a circle

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	• Design patterns that are based on the hexagon within the circle • Use measuring tools to construct 2-D shapes using given dimensions and angles • Use conventional markings and labels for lines and angles
Number - Multiplication and division including decimals	• Make a reasonable estimate of the answer to a calculation and use this to check the answer • Multiply one-digit numbers with up to two decimal places by a two-digit whole number using a written method, e.g. 2· 64 × 38
Number - Fractions	• Recognise common factors and common multiples • Identify and create equivalent fractions • Add and subtract fractions with different denominators and mixed numbers • Multiply simple pairs of proper fractions • Divide proper fractions by whole numbers • Simplify fractions by cancelling common factors
Measurement (volume and capacity)	• Calculate and convert between litres and millilitres to solve problems involving capacity, using decimal notation up to three decimal places • Estimate, calculate and compare volume of cubes and cuboids using cubic centimetres (cm^3), cubic metres (m^3) and cubic millimetres (mm^3) • Use the rule $V = lbh$ to calculate the volume of a cube or cuboid and to find missing lengths
Number - Addition and subtraction, Multiplication and division	• Perform mental and written calculations, including with mixed operations and large numbers • Understand the order of operations and use the BODMAS rule to carry out calculations involving the four operations, brackets and orders • Apply a range of problem solving, investigative and thinking skills in order to solve mathematical problems and investigations
Ratio and Proportion	• Recognise and solve proportion problems • Understand and use ratio to solve problems • Solve problems involving scale factors • Solve missing value ratio problems using multiplication and division • Use knowledge of fractions and multiples to solve ratio and proportion problems
Geometry – Position and	• Use coordinates to describe the positions of shapes in all four quadrants

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direction	• Plot and label rectangles, squares, parallelograms and rhombuses in the four quadrants • Use the properties of shapes to predict missing coordinates • Identify, describe and represent the position of a shape following a translation in the first quadrant of a coordinates grid • Use coordinates to reflect shapes in the axes into all four quadrants
Number - Multiplication and division including decimals	• Use knowledge of multiples and factors to conduct tests of divisibility. • Make a reasonable estimate of the answer to a calculation and use this to check the answer • Multiply whole numbers with up to 4 digits, and numbers with up to two decimal places, by a one- or two-digit whole number, choosing the most efficient method of calculating the answer • Divide whole numbers with up to 4 digits, and numbers with up to two decimal places, by a one- or two-digit whole number, choosing the most efficient
Number – Fractions (including decimals and percentages)	• Associate a fraction with division • Calculate decimal fraction equivalents • Recall equivalences between fractions, decimals and percentages • Compare fractions, decimals and percentages • Solve problems involving the calculation of percentages
Statistics	• Interpret and construct pie charts and use pie charts to solve problems • Interpret and construct line graphs and use line graphs to solve problems • Draw graphs relating two variables • Collect, organise and interpret data from an enquiry to solve a problem • Calculate and interpret the mean as an average