

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

Year 5 Mathematics Curriculum Overview

Autumn Term

Topic	Skills
Number - Number and place value	<ul style="list-style-type: none"> • Identify the value of each digit in a five-digit number • Use the value of the digits to compare and order numbers • Count on and back in tens and hundreds • Round numbers up to 100 000 to the nearest 10, 100 and 1000
Number - Addition and subtraction	<ul style="list-style-type: none"> • Add mentally two- or three-digit multiples of 10 to a four-digit number • Add mentally multiples of 10 to a five-digit number • Subtract mentally two- or three-digit multiples of 10 to a four-digit number • Subtract mentally multiples of 10 to a five-digit number • Subtract mentally near multiples of 10 000 from a five-digit number
Geometry - Properties of shape	<ul style="list-style-type: none"> • Identify 3-D shapes with parallel or perpendicular faces or edges • Identify properties such as the number of faces, edges and vertices in 3-D shapes from 2-D representations • Use 2-D views of a 3-D shape to construct 3-D shapes • Draw a 3-D shape as it would be seen from the top, from the front and from the side • Match a 3-D shape to a 2-D representation of the orientation of the shape
Number - Multiplication and division	<ul style="list-style-type: none"> • Multiply by 10/100 and adjust to find the answer when multiplying by 9/99 • Recall all the multiplication facts for all tables up to 10x10 and multiply all by 10, 100 or 1000 • Mentally multiply 10×10 and then multiply by 10, 100 or 1000 • Multiply a two-digit number by a multiple of 10 • Multiply by 5/50 using multiplication by 10/100 and halving • Multiply by 25 using multiplication by 100, halving and halving again
Number - Fractions	<ul style="list-style-type: none"> • Divide a whole number by the denominator and multiply the answer by the numerator • Count forwards or backwards in simple fractions • Recognise, describe and continue number sequences involving fractions • Write families of equivalent fractions • Compare and order fractions
Geometry- Position and direction	<ul style="list-style-type: none"> • Translate a shape on a 2-D grid and know that the shape has not changed • Translate two or more shapes to make a tiling pattern on a 2-D grid

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	<ul style="list-style-type: none"> • Create 2-D shapes and, by translating the shape in different directions, form a tiling pattern • Identify the positions of a shape after a translation in the first quadrant of a 2-D grid
Number - Addition and subtraction	<ul style="list-style-type: none"> • Add whole numbers mentally using the number line or jottings if necessary • Add whole numbers with five digits using the formal written method • Estimate and use rounding to check answers to a calculation
Number - Decimals	<ul style="list-style-type: none"> • Know the place value of decimal numbers with two decimal places • Know that decimals with one decimal place are tenths and decimals with two decimal places are hundredths • Round decimals with two decimal places to the nearest whole number and to one decimal place • Add decimals, including complements of 1 • Recognise, describe and continue number sequences involving decimals
Measurement - Mass	<ul style="list-style-type: none"> • Convert between grams and kilograms using knowledge of place value, multiplication and division • Use the equivalence of 1 kg - 2.2 lb to convert metric units to imperial units and vice versa • Use all four operations, decimal notation and scaling to solve problems involving mass
Number - Multiplication and division	<ul style="list-style-type: none"> • Use knowledge of multiplication tables to recall square and cube numbers • Recall all the multiplication facts for all tables up to 10x10 and multiply all by 10, 100 or 1000 • Find the common factors of two numbers • Identify multiples of all numbers up to 12x12 • Recognise when to use mental strategies to work out calculations
Number - Multiplication and division	<ul style="list-style-type: none"> • Identify whether a number up to 100 is prime or composite and explain their reasoning • Recall the division facts for all multiplication tables up to 12x12 and associated facts involving multiples of 10, 100, 1000 • Make a reasonable estimate for the answer to a calculation
Measurement (time)	<ul style="list-style-type: none"> • Convert between analogue and digital 24-hour clocks to solve problems • Solve problems involving durations of time • Use all four operations to solve problems involving time, including scaling

Spring Term

Topic	Skills
Number - Number and	<ul style="list-style-type: none"> • Identify the value of each digit in a six-digit number

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place value	<ul style="list-style-type: none"> • Use the value of the digits to compare and order numbers • Count on and back in tens, hundreds and thousands, knowing which digit to focus on • Round numbers to 1 000 000 to the nearest 10, 100 and 1000 • Interpret negative numbers in context • Count forwards and backwards with positive and negative whole numbers, including through zero
Number - Addition and subtraction	<ul style="list-style-type: none"> • Subtract whole numbers mentally using the number line or jottings if necessary • Subtract whole numbers with five digits using the formal written method • Estimate and use rounding to check answers to a calculation • Add and subtract decimals with two decimal places using formal written methods of addition and subtraction
Geometry - Properties of shape	<ul style="list-style-type: none"> • Know that an acute angle is less than a right angle and is between 0° and 90° • Know that an obtuse angle is less than a straight line, is greater than a right angle and is between 90° and 180° • Know that a reflex angle is greater than a straight line and is between 180° and 360° • Use a protractor to measure and draw given angles to the nearest degree • Identify and calculate the size of the unknown angle - at a right angle and making a $1/4$ turn - at a point on a straight line and making a $1/2$ turn- at a point and making one whole turn
Number - Multiplication and division	<ul style="list-style-type: none"> • Make a reasonable estimate of the answer to a calculation • Partition three-digit numbers into hundreds, tens and ones • Divide a multiple of ten by a one-digit number • Use the formal written method of short division to calculate $HTO \div O$ • Express the remainder in a division calculation as a whole number, a fraction or a decimal • Determine whether to round up or round down a remainder in a division calculation according to the context
Number - Fractions	<ul style="list-style-type: none"> • Identify thousandths and relate them to tenths and hundredths • Compare and order fractions by converting them to the lowest common denominator • Add and subtract fractions
Measurement (length)	<ul style="list-style-type: none"> • Convert between kilometres and metres, centimetres and metres, centimetres and millimetres using knowledge of place value, multiplication and division • Use equivalence of $1 \text{ inch} \approx 2.5 \text{ cm}$ to convert metric units to imperial units and vice versa • Use all four operations, decimal notation and scaling to solve problems involving length
Number - Decimals	<ul style="list-style-type: none"> • Know that decimals with three decimal places are thousandths • Know the place value of decimal numbers with three decimal places

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	<ul style="list-style-type: none"> • Order decimals with three places by comparing thousandths • Round decimals with two decimal places to the nearest whole number and to one decimal place
Number - Addition and Subtraction	<ul style="list-style-type: none"> • Use known number facts to add and subtract tenths • Use knowledge of adding and subtracting two-digit numbers to add and subtract hundredths • Add and subtract decimals with different numbers of decimal places
Statistics	<ul style="list-style-type: none"> • Interpret and present continuous data in line graphs • Solve comparison, sum and difference problems using data presented in line graphs • Complete, read and interpret data in a table • Complete, read and interpret data in a timetable using 24-hour notation • Apply knowledge of coordinates to interpreting data in time graphs
Number - Multiplication and division	<ul style="list-style-type: none"> • Make a reasonable estimate of the answer to a calculation • Multiply a two-digit number by a one-digit number and a multiple of ten • Use a written method to calculate $TO \times TO$
Number - Percentages (including decimals and fractions)	<ul style="list-style-type: none"> • Recognise that per cent relates to hundredths • Recognise equivalent fractions, decimals and percentages • Calculate percentages of numbers, amounts and quantities
Measurement (perimeter and area)	<ul style="list-style-type: none"> • Measure and calculate the perimeter P of composite rectilinear shapes in centimetres and metres using the rule $P = 2(a + b)$ • Find an unknown length of a side in a rectangle when the perimeter of the rectangle and the length of an adjacent side are given • Calculate the area of rectangles, in square centimetres (cm^2) and square metres (m^2), using the rule $A = a \times b$ • Compare the area of rectangles using square centimetres (cm^2) and square metres (m^2) • Estimate the area of irregular shapes • Find an unknown length of a side in a rectangle when the area of the rectangle and the length of an adjacent side are given • Calculate the area of irregular shapes that are formed by two or more rectangles

Summer Term

Topic	Skills
Number - Number and	<ul style="list-style-type: none"> • Identify the value of each digit in a six-digit number

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place value	<ul style="list-style-type: none"> • Use the value of the digits to compare and order numbers • Count on and back in steps of 100, 1000, 10 000 and 100 000, knowing which digit to focus on • Round numbers to 1 000 000 to the nearest 10 000 and 100 000 • Read and write Roman numerals to 1000 (M) • Read years written with Roman numerals
Number - Addition and subtraction	<ul style="list-style-type: none"> • Add and subtract multiples of 10, 100 and 1000 to and from six-digit numbers • Add and subtract decimals with two decimal places • Use the formal written methods of addition and subtraction to add and subtract five- and six-digit numbers and calculations involving numbers with different amounts of digits
Geometry - Properties of shape	<ul style="list-style-type: none"> • Deduce facts related to rectangles and find missing lengths and angles • Make conjectures about the angles formed between sides, and between diagonals and parallel sides • Use conventional markings for parallel lines and right angles • Use reasoning based on equal sides and angles to distinguish between regular and irregular polygons • Make deductions about missing angles using angle sum facts • Relate the calculations for missing angles to missing number problems
Number - Multiplication and division including measurement (money)	<ul style="list-style-type: none"> • Make a reasonable estimate of the answer to a calculation • Partition four-digit numbers into thousands, hundreds, tens and ones • Multiply and divide a four-digit number by a one-digit number choosing the most efficient method of calculating the answer • Recall the multiplication and division facts of all multiplication tables up to 12×12 and associated facts involving multiples of 10, 100 and 1000 • Use knowledge of multiplication tables up to 12×12 to find factors • Identify multiples of all multiplication tables up to 12×12 and associated facts involving multiples of 10
Number - Fractions	<ul style="list-style-type: none"> • Recognise a mixed number and an improper fraction and convert from one form to the other • Write mathematical statements > 1 as a mixed number • Multiply a proper fraction by a whole number • Multiply a mixed number by a whole number
Measurement (volume)	<ul style="list-style-type: none"> • Convert between litres and millilitres using knowledge of place value, multiplication and division

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and capacity)	<ul style="list-style-type: none"> • Use a scale and a conversion graph to convert pints to litres and vice versa • Calculate the volume of a cuboid by counting the number of 1 cm^3 cubes in each layer • Use all four operations, decimal notation and scaling to solve problems involving volume
Number - Addition and subtraction including measurement (money)	<ul style="list-style-type: none"> • Know which digit(s) to focus on when adding or subtracting whole numbers and decimals • Use jottings to support mental calculations including those involving decimals • Use the formal written methods of addition and subtraction to add and subtract five- and six-digit numbers • Use rounding to check answers to calculations
Number - Percentages (including fractions and decimals)	<ul style="list-style-type: none"> • Recognise equivalent fractions, decimals and percentages • Calculate percentages of numbers, amounts and quantities • Solve problems involving percentages
Geometry - Position and direction	<ul style="list-style-type: none"> • Reflect a variety of diagrams on a grid with respect to a specific line of symmetry • Reflect shapes in one and two lines of symmetry in different orientations and understand that the shape has not changed • Reflect a 2-D shape in a line of symmetry using coordinates in the first quadrant • Reflect a shape in two lines of symmetry using coordinates in the first quadrant • Identify and describe the position of a shape following a reflection
Number - Multiplication and division including measurement (money)	<ul style="list-style-type: none"> • Make a reasonable estimate of the answer to a calculation • Multiply mentally a three-digit number by a one-digit number • Multiply mentally a three-digit number by multiple of 10 and 100 • Use a written method to calculate multiplication of $\text{HTO} \times \text{TO}$
Number - Multiplication and division including measurement (money)	<ul style="list-style-type: none"> • Make a reasonable estimate of the answer to a calculation • Partition four-digit numbers into thousands, hundreds, tens and ones • Divide 10 and 100 times a multiple of a number by a one-digit number • Use the formal written method of short division to calculate $\text{ThHTO} \div \text{O}$ • Express the remainder in a division calculation as a whole number, a fraction or a decimal • Determine whether to round up or round down a remainder in a division calculation according to the context

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Statistics

- Interpret and present discrete data in line graphs
- Solve comparison, sum and difference problems using data presented in line graphs
- Complete, read and interpret data in a table
- Find the value of each interval on a scale and use this to estimate values of readings between divisions
- Apply knowledge of coordinates and scales to interpreting data in time graphs
- Begin to decide which representations of data are most appropriate and why