

Progression of maths

We have a **math long term plan** which is an overview of the maths taught across the year. There is a detailed **math curriculum prioritisation year overview (MTP)** for each year group. This is based on the National Curriculum, NCETM, Curriculum Prioritisation materials, White Rose (Year 6), for planning and resourcing lessons. The **maths curriculum prioritisation year overview** includes objective taught in discrete maths lessons and in our separate Mastering Number fluency lessons. Information of our discrete maths teaching is shared via the **half termly learning leaflet** and in **weekly homework**. Our **Maths Policy**, including the **calculation policy** is in the process of being developed in collaboration with the Cambridge Maths Hub

Subject content	Year 3	Year 4	Year 5	Year 6
Number and Place Value	<p>To know that 10 tens are equivalent to 1 hundred, and that 100 is 10 times the size of 10; apply this to identify and work out how many 10s there are in other three-digit multiples of 10 e.g. 340 is made up of 34 tens.</p> <p>To recognise the place value of each digit in three-digit numbers and compose and decompose three-digit numbers using standard and non-standard partitioning.</p> <p>To reason about the location of any three-digit number in the linear number system, including identifying the previous and next multiple of 100 and 10.</p> <p>To divide 100 into 2, 4, 5 and 10 equal parts, and read scales/number lines marked in multiples of 100 with 2, 4, 5 and 10 equal parts.</p>	<p>To know that 10 hundreds are equivalent to 1 thousand, and that 1,000 is 10 times the size of 100; apply this to identify and work out how many 100s there are in other four-digit multiples of 100 e.g. 4,500 is made of 45 hundreds.</p> <p>To recognise the place value of each digit in four-digit numbers and compose and decompose four-digit numbers e.g. 4 thousand and 13 hundreds is equal to 5,300</p> <p>To reason about the location of any four-digit number in the linear number system, including identifying the previous and next multiple of 1,000 and 100, and rounding to the nearest of each.</p> <p>To divide 1,000 into 2, 4, 5 and 10 equal parts, and read scales/number lines marked in multiples of 1,000 with 2, 4, 5 and 10 equal parts.</p>	<p>To know that 10 tenths are equivalent to 1 one, and that 1 is 10 times the size of 0.1.</p> <p>To know that 100 hundredths are equivalent to 1 one, and that 1 is 100 times the size of 0.01.</p> <p>To know that 10 hundredths are equivalent to 1 tenth, and that 0.1 is 10 times the size of 0.01.</p> <p>To recognise the place value of each digit in numbers with up to 2 decimal places and compose and decompose numbers with up to 2 decimal places.</p> <p>To reason about the location of any number with up to 2 decimals places in the linear number system, including identifying the previous and next multiple of 1 and 0.1 and rounding to the nearest of each.</p> <p>To divide 1 into 2, 4, 5 and 10 equal parts, and read scales/number lines marked in units of 1 with 2, 4, 5 and 10 equal parts.</p>	<p>To understand the relationship between powers of 10 from 1 hundredth to 10 million, and use this to make a given number 10, 100, 1,000, 1 tenth, 1 hundredth or 1 thousandth times the size (multiply and divide by 10, 100 and 1,000).</p> <p>To recognise the place value of each digit in numbers up to 10 million, including decimal fractions, and compose and decompose numbers up to 10 million using standard and non-standard partitioning.</p> <p>To reason about the location of any number up to 10 million, including decimal fractions, in the linear number system, and round numbers, as appropriate, including in contexts.</p>
Number facts	<p>To secure fluency in addition and subtraction facts that cross 10, through continued practice e.g. $8 + 4$ and $13 - 5$.</p> <p>To recall multiplication facts, and related division facts, in the 10, 5, 2, 4 and 8 multiplication tables. Recognise multiples of 10, 5, 2, 4 and 8.</p> <p>To apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 10) e.g. $8 + 5 = 13$ so $80 + 50 = 130$.</p>	<p>To recall multiplication and division facts up to 12×12 and recognise products in multiplication tables as multiples of the corresponding number.</p> <p>To solve division problems, with two-digit dividends and one-digit divisors, that involve remainders.</p> <p>To apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 100).</p>	<p>To secure fluency in multiplication table facts, and corresponding division facts, through continued practice.</p> <p>To apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 1 tenth or 1 hundredth).</p>	
Addition and Subtraction	<p>To calculate complements to 100 e.g. $32 + 68 = 100$; $100 - 74 = 26$</p>	<p>To review adding and subtracting up to three-digit numbers using columnar methods</p>	<p>To add and subtract using decimal notation (within the context of money).</p>	<p>To understand that 2 numbers can be related additively or multiplicatively and quantify additive and multiplicative relationships (multiplicative relationships</p>

	To add and subtract up to three-digit numbers using columnar methods.			restricted to multiplication by a whole number). To use a given additive or multiplicative calculation to derive or complete a related calculation, using arithmetic properties, inverse relationships, and place-value understanding. To solve problems involving ratio relationships (ratio and proportion). To solve problems with 2 unknowns (algebra).
Multiplication and Division	To apply known multiplication and division facts to solve maths stories. Use grouping (divide 12 into groups of 2) and sharing division (divide 12 into 2 groups).	To multiply and divide whole numbers by 10 and 100 (keeping to whole number quotients); understand this as equivalent to making a number 10 or 100 times the size. To manipulate multiplication and division equations and understand and apply the commutative property of multiplication. To understand and apply the distributive property of multiplication.	To multiply and divide numbers by 10 and 100; understand this as equivalent to making a number 10 or 100 times the size, or 1 tenth or 1 hundredth times the size. To find factors and multiples of positive whole numbers, including common factors and common multiples, and express a given number as a product of 2 or 3 factors. To multiply any whole number with up to 4 digits by any one-digit number using a formal written method.	
Fractions	To interpret and write proper fractions to represent 1 or several parts of a whole that is divided into equal parts. To find unit fractions of quantities using known division facts (multiplication tables fluency) e.g. find $\frac{1}{4}$ of 24 ($24 \div 4$). To reason about the location of any fraction within 1 in the linear number system e.g. position $\frac{1}{5}$ on a 0 to 1 number line. To add and subtract fractions with the same denominator, within 1 e.g. $\frac{2}{7} + \frac{4}{7}$.	To reason about the location of mixed numbers in the linear number system e.g. position $4\frac{1}{5}$ on a 0 to 5 number line. To convert mixed numbers to improper fractions and vice versa e.g. $2\frac{3}{4} = \frac{11}{4}$. To add and subtract improper and mixed fractions with the same denominator, including bridging whole numbers e.g. $1\frac{2}{3} + \frac{2}{3} = 2\frac{1}{3}$ and $\frac{11}{3} + \frac{8}{3} = \frac{19}{3}$	To find non-unit fractions of quantities. To find equivalent fractions and understand that they have the same value and the same position in the linear number system. To recall decimal fraction equivalents for $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{5}$ and $\frac{1}{10}$, and for multiples of these proper fraction	To recognise when fractions can be simplified and use common factors to simplify fractions. Express fractions in a common denomination and use this to compare fractions that are similar in value. To compare fractions with different denominators, including fractions greater than 1, using reasoning, and choose between reasoning and common denomination as a comparison strategy.
Geometry	To recognise right angles as a property of shape or a description of a turn and identify right angles in 2D shapes presented in different orientations. To draw polygons by joining marked points, and identify parallel and perpendicular sides.	To draw polygons, specified by coordinates in the first quadrant, and translate within the first quadrant (position and direction). To compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes. To identify regular polygons, including equilateral triangles and squares, as those in which the side-lengths are equal, and the angles are equal.	To compare angles, estimate and measure angles in degrees ($^{\circ}$) and draw angles of a given size. To identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed. To identify acute and obtuse angles and compare and order angles up to two right angles by size	To draw, compose, and decompose shapes according to given properties, including dimensions, angles and area, and solve related problems. To draw 2-D shapes using given dimensions and angles recognise, describe and build simple 3-D shapes, including making nets. To compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons. To illustrate and name parts of circles, including radius, diameter and

		<p>To find the perimeter of regular and irregular polygons.</p> <p>To identify line symmetry in 2D shapes presented in different orientations.</p> <p>To reflect shapes in a line of symmetry and complete a symmetric figure or pattern with respect to a specified line of symmetry.</p>	<p>To identify angles at a point on a straight line and 1/2 a turn (total 180o)</p> <p>To identify other multiples of 90o</p> <p>To use the properties of rectangles to deduce related facts and find missing lengths and angles</p>	<p>circumference and know that the diameter is twice the radius.</p> <p>To recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles.</p> <p>To describe positions on the full coordinate grid (all four quadrants) (position and direction).</p> <p>To draw and translate simple shapes on the coordinate plane and reflect them in the axes (position and direction).</p>
Statistics	<p>To interpret and present data using bar charts, pictograms and tables</p> <p>To solve one-step and two-step questions using information presented in scaled bar charts and pictograms and tables.</p>	<p>To interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs.</p> <p>To solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs.</p>	<p>To solve comparison, sum and difference problems using information presented in a line graph.</p> <p>To complete, read and interpret information in tables, including timetables.</p>	<p>To interpret and construct pie charts and line graphs and use these to solve problems.</p> <p>To calculate and interpret the mean as an average.</p>
Measurement	<p>To measure, compare, add and subtract lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml).</p> <p>To measure the perimeter of simple 2-D shapes.</p> <p>To add and subtract amounts of money to give change, using both £ and p in practical contexts.</p> <p>To tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks.</p> <p>To estimate and read time with increasing accuracy to the nearest minute; Record and compare time in terms of seconds, minutes and hours; Use vocabulary such as o'clock, a.m./p.m., morning, afternoon, noon and midnight.</p> <p>To know the number of seconds in a minute and the number of days in each month, year and leap year.</p>	<p>To convert between different units of measurement [for example kilometre to metre; Hour to minute].</p> <p>To measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres.</p> <p>To measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres.</p> <p>To read, write and convert time between analogue and digital 12–24-hour clocks.</p> <p>To solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days.</p>	<p>To find the area of rectilinear shapes by counting squares.</p> <p>To estimate, compare and calculate different measures including money in pounds and pence.</p> <p>To convert between different metric units of measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre; time) up to 3 decimal places.</p> <p>To convert between miles and kilometres (NCY6).</p> <p>To recognise that shapes with the same areas can have different perimeters and vice versa.</p> <p>To understand and use approximate equivalences between metric units and common imperial units such as inches, pounds, and pints.</p>	<p>To recognise when it is possible to use formulae for area and volume of shapes</p> <p>To calculate the area of parallelograms and triangles</p> <p>To calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm³) and cubic metres (m³), and extending to other units [for example, mm³ and km³].</p>

	To compare durations of events.		<p>To calculate and compare the area of rectangles (including squares), and including standard units, square centimetres (cm^2) and square metres (m^2) and estimate the area of irregular shapes.</p> <p>To calculate the area of parallelograms and triangles.</p> <p>To estimate volume [for example, 1 cm^3 blocks to build cuboids (including cubes)] and capacity [for example, using water].</p> <p>To recognise when it is possible to use formulae for area and volume of shape.</p> <p>To solve problems involving converting between units of time.</p> <p>To use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling.</p>	
Ratio and proportion				<p>To solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts.</p> <p>To solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison</p> <p>To solve problems involving similar shapes where the scale factor is known or can be found.</p> <p>To solve problems involving unequal sharing and grouping using knowledge of fractions and multiples</p>
Algebra				<p>To use simple formulae</p> <p>To generate and describe linear number sequences.</p> <p>To express missing number problems algebraically inc pairs of numbers that satisfy an equation with two unknowns.</p>

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How will we implement maths in our school?

- We teach discrete maths lessons which consist of 4x45 minute lessons per week. This is evidenced in our MTP and lesson PowerPoints which include further guidance from the NCETM.
- We teach separate mathematical fluency known as **Mastering Number** 5x15 minute lessons per week. This is evidenced on our MTP and Mastering Number lesson plans.
- We have allotted 4x15 minutes per week for **Targeted Teaching** to revise and retrieve previous learning. This may include: opportunities for problem solving, oracy, reasoning and collaboration.
- As part of our **intervention** for maths we plan **pre-teaching** activities for pupils that have been identified as needing additional support. This is in preparation for the main maths lessons and ensures that the learning is accessible.
- **Numbots** and **TTRockstars** are used by pupils at home and on iPads in school to support with calculation.
- You will see pupils using **maths working walls** in classrooms, for example, vocabulary and representations. Pupils are encouraged to independently choose concrete resources to support their maths.
- Evidence of maths learning can be seen in individual pupil maths books and on Seesaw.
- Weekly learning **homework** includes what we have been learning in maths and a challenge.
- We deliver **Parent workshops** to share information, good practice, vocabulary and resources, as we believe the partnership between home and school is vital.
- Through oracy, we use stem sentences, gesture and mathematical vocabulary which is clearly modelled, shared and displayed.
- Pupils are given the opportunity to reflect on mistakes in their learning and supported to make corrections with a purple pen.