
	<b>Subject Overview 2019/20: Maths</b> <b>Intent (Skills/ knowledge)</b>				
		<b>Year 3</b>	<b>Year 4</b>	<b>Year 5</b>	<b>Year 6</b>	
		<b>Number and Place Value</b>				
<b>INTENT</b>	<b>Counting</b>	Count from 0 in multiples of 4, 8, 50 and 100  Count up and down in tenths	Count in multiples of 6, 7, 9, 25 and 1000  Count backwards through zero to include negative numbers Count up and down in hundredths	Count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000 Count forwards and backwards in decimal steps	Count forwards or backwards in steps of integers, decimals or powers of 10 for any number	
	<b>Place Value</b>	Read and write numbers up to 1000 in numerals and in words Read and write numbers with one decimal place  Recognise the place value of each digit in a three-digit number (hundreds, tens, ones)  Identify the value of each digit to one decimal place  Partition numbers in different ways (for example, $146 = 100 + 40 + 6$ & $146 = 130 + 16$ )  Identify, represent and estimate numbers using different representations, including the number line	Read and write numbers to at least 10 000 Read and write numbers with up to two decimal places  Recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones)  Identify the value of each digit to two decimal places  Partition numbers in different ways (for example, $2.3 = 2 + 0.3$ and $2.3 = 1 + 1.3$ )  Identify, represent and estimate numbers using different representations, including the number line	Read and write numbers to at least 1 000 000  Read and write numbers with up to three decimal places  Determine the value of each digit in numbers to at least 1 000 000  Identify the value of each digit to three decimal places  Identify, represent and estimate numbers using the number line	Read and write numbers up to 10 000 000  Determine the value of each digit in numbers up to 10 000 000  Identify the value of each digit to three decimal places  Identify, represent and estimate numbers using the number line	

	<b>Comparing and Ordering</b>	<p>Compare and order numbers up to 1000</p> <p>Compare and order numbers with one decimal place</p> <p>Find 1, 10 or 100 more or less than a given number</p>	<p>Order and compare numbers beyond 1000</p> <p>Order and compare numbers with the same number of decimal places up to two decimal places</p> <p>Find 0.1, 1, 10, 100 or 1000 more or less than a given number</p>	<p>Order and compare numbers to at least 1 000 000</p> <p>Order and compare numbers with up to three decimal places</p> <p>Find 0.01, 0.1, 1, 10, 100, 1000 and other powers of 10 more or less than a given number</p>	<p>Order and compare numbers up to 10 000 000</p> <p>Order and compare numbers including integers, decimals and negative numbers</p> <p>Find 0.001, 0.01, 0.1, 1, 10 and powers of 10 more or less than a given number</p>
	<b>Rounding, approximation and estimation</b>	<p>Round numbers to at least 1000 to the nearest 10 or 100</p>	<p>Round any number to the nearest 10, 100 or 1000</p> <p>Round decimals with one decimal place to the nearest whole number</p>	<p>Round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000</p> <p>Round decimals with two decimal places to the nearest whole number and to one decimal place</p>	<p>Round any whole number to a required degree of accuracy</p> <p>Round decimals with three decimal places to the nearest whole number or one or two decimal places</p>
	<b>Multiplying by powers of 10</b>	<p>Find the effect of multiplying a one- or two-digit number by 10 and 100, identify the value of the digits in the answer</p>	<p>Find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths</p>	<p>Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000</p>	<p>Multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places</p>
	<b>Negative numbers</b>		<p>Count backwards through zero to include negative numbers (see counting)</p>	<p>Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers through zero</p>	<p>Use negative numbers in context, and calculate intervals across zero</p>
	<b>Sequences and patterns</b>	<p>Describe and extend number sequences involving counting on or back in different steps</p>	<p>Describe and extend number sequences involving counting on or back in different steps, including sequences with multiplication and division steps</p>	<p>Describe and extend number sequences including those with multiplication and division steps and those where the step size is a decimal</p>	<p>Describe and extend number sequences including those with multiplication and division steps, inconsistent steps, alternating steps and those where the step size is a decimal</p>
	<b>Roman numerals</b>	<p>Read Roman numerals from I to XII (see time)</p>	<p>Read Roman numerals to 100 (I to C) and know that over time, the numeral system</p>	<p>Read Roman numerals to 1000 (M) and recognise years written in Roman numerals</p>	<p>Solve number and practical problems that involve all of the above</p>

		changed to include the concept of zero and place value		
	<b>Solving number problems</b>	Solve number problems and practical problems involving these ideas	Solve number and practical problems that involve all of the above and with increasingly large positive numbers	Solve number problems and practical problems that involve all of the above
	<b>Number – addition and subtraction</b>			
	<b>Understanding addition and subtraction</b>	<p>Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting, written method)</p> <p>Understand and use take away and difference for subtraction, deciding on the most efficient method for the numbers involved, irrespective of context</p>	<p>Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting, written method)</p>	<p>Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting, written method)</p>
	<b>Addition and subtraction facts</b>	<p>Recall and use addition and subtraction facts for 100 (multiples of 5 and 10)</p> <p>Derive and use addition and subtraction facts for 100</p> <p>Derive and use addition and subtraction facts for multiples of 100 totalling 1000</p>	<p>Recall and use addition and subtraction facts for 100</p> <p>Recall and use addition and subtraction facts for multiples of 100 totalling 1000</p> <p>Derive and use addition and subtraction facts for 1 and 10 (with decimal numbers to one decimal place)</p>	<p>Recall and use addition and subtraction facts for 1 and 10 (with decimal numbers to one decimal place)</p> <p>Derive and use addition and subtraction facts for 1 (with decimal numbers to two decimal places)</p>
	<b>Mental methods</b>	<p>Select a mental strategy appropriate for the numbers involved in the calculation</p> <p>Add and subtract numbers mentally, including:</p> <ul style="list-style-type: none"> <li>- a three-digit number and ones</li> <li>- a three-digit number and tens</li> <li>- a three-digit number and hundreds</li> </ul>	<p>Select a mental strategy appropriate for the numbers involved in the calculation</p> <p>Add and subtract mentally combinations of two and three digit numbers and decimals to one decimal place</p>	<p>Select a mental strategy appropriate for the numbers involved in the calculation</p> <p>Add and subtract numbers mentally with increasingly large numbers and decimals to two decimal places</p>
	<b>Written methods</b>	Add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction	Add and subtract numbers with up to 4 digits and decimals with one decimal place using the formal written methods of columnar addition and subtraction where appropriate	Add and subtract whole numbers with more than 4 digits and decimals with two decimal places, including using formal written methods

				(columnar addition and subtraction)	
	<b>Estimating and checking calculations</b>	Estimate the answer to a calculation and use inverse operations to check answers	Estimate and use inverse operations to check answers to a calculation	Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy	Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy
	<b>Order of operations</b>				Use their knowledge of the order of operations to carry out calculations involving the four operations
	<b>Solving addition and subtraction problems including those with missing numbers</b>	Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction	Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why Solve addition and subtraction problems involving missing numbers	Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why Solve addition and subtraction problems involving missing numbers	Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why Solve problems involving addition, subtraction, multiplication and division, including those with missing numbers
		<b>Number - multiplication and division</b>			
	<b>Understanding multiplication and division</b>	Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known or related fact, calculate mentally, use a jotting, written method)  Understand that division is the inverse of multiplication and vice versa Understand how multiplication and division statements can be represented using arrays Understand division as sharing and grouping and use each appropriately	Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known or related fact, calculate mentally, use a jotting, written method)  Recognise and use factor pairs and commutativity in mental calculations	Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known or related fact, calculate mentally, use a jotting, written method)  Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers	Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known or related fact, calculate mentally, use a jotting, written method)
	<b>Multiplication and division facts</b>	Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables  Derive and use doubles of all numbers to 100 and corresponding halves	Recall multiplication and division facts for multiplication tables up to $12 \times 12$  Use partitioning to double or halve any number, including decimals to one decimal place	Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers	Identify common factors, common multiples and prime numbers  Use partitioning to double or halve any number

		Derive and use doubles of all multiples of 50 to 500		Establish whether a number up to 100 is prime and recall prime numbers up to 19 Recognise and use square numbers and cube numbers, and the notation for squared (2) and cubed (3)  Use partitioning to double or halve any number, including decimals to two decimal places	
	<b>Mental methods</b>	Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental methods	Use place value, known and derived facts to multiply and divide mentally, including: - multiplying by 0 and 1 - dividing by 1 - multiplying together three numbers	Multiply and divide numbers mentally drawing upon known facts Solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes	Perform mental calculations, including with mixed operations and large numbers
	<b>Written methods</b>	Write and calculate mathematical statements for multiplication using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, progressing to formal written methods  Write and calculate mathematical statements for division using the multiplication tables that they know, including for two-digit numbers divided by one-digit numbers, progressing to formal written methods	Multiply two-digit and three-digit numbers by a one-digit number using formal written layout  Divide numbers up to 3 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context	Multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers  Divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context	Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication Multiply one-digit numbers with up to two decimal places by whole numbers  Divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context Use written division methods in cases where the answer has up to two decimal places
	<b>Estimating and checking calculations</b>	Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy	Use estimation and inverse to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy	Use estimation and inverse to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy	Use estimation and inverse to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy
	<b>Order of operations</b>				Use their knowledge of the order of operations to carry out calculations involving the four operations
	<b>Solving multiplication</b>	Solve problems, including missing number problems, involving	Solve problems involving multiplying and adding, including using the distributive law	Solve problems involving addition, subtraction,	Solve problems involving addition, subtraction, multiplication and division

	<b>and division problems including those with missing numbers</b>	multiplication and division (and interpreting remainders), including positive integer scaling problems and correspondence problems in which n objects are connected to m objects	to multiply two digit numbers by one digit, division (including interpreting remainders), integer scaling problems and harder correspondence problems such as n objects are connected to m objects	multiplication and division and a combination of these, including understanding the meaning of the equals sign Solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates	
		<b>Number - fractions (including decimals and percentages)</b>			
	<b>Understanding fractions</b>	Show practically or pictorially that a fraction is one whole number divided by another (for example $\frac{3}{4}$ , can be interpreted as $3 \div 4$ ) Understand that finding a fraction of an amount relates to division	Understand that a fraction is one whole number divided by another (for example $\frac{3}{4}$ , can be interpreted as $3 \div 4$ )		
	<b>Fractions of objects, shapes and quantities</b>	Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators  Recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators  Recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10	Recognise, find and write fractions of a discrete set of objects including those with a range of numerators and denominators  Recognise that hundredths arise when dividing an object by a hundred and dividing tenths by ten	Recognise mixed numbers and improper fractions and convert from one form to the other  Read and write decimal numbers as fractions (e.g. $0.71 = \frac{71}{100}$ )	
	<b>Counting, comparing and ordering fractions</b>	Count on and back in steps of $\frac{1}{2}$ , $\frac{1}{4}$ and $\frac{1}{3}$  Compare and order unit fractions and fractions with the same denominators (including on a number line)	Count on and back in steps of unit fractions  Compare and order unit fractions and fractions with the same denominators (including on a number line) (continued from Year 3)	Count on and back in mixed number steps such as $1 \frac{1}{2}$  Compare and order fractions whose denominators are all multiples of the same number (including on a number line)	Compare and order fractions, including fractions $> 1$ (including on a number line)
	<b>Equivalence</b>	Recognise and show, using diagrams, equivalent fractions with small denominators	Recognise and show, using diagrams, families of common equivalent fractions  Recognise and write decimal equivalents of any number of tenths or hundredths Recognise and write decimal equivalents to $\frac{1}{4}$ , $\frac{1}{2}$ , $\frac{3}{4}$	Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths  Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents	Use common factors to simplify fractions; use common multiples to express fractions in the same denomination  Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts

					Associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. $\frac{2}{8}$ )
	<b>Calculating with fractions</b>	Add and subtract fractions with the same denominator within one whole (using diagrams) (for example, $\frac{5}{7} + \frac{1}{7} = \frac{6}{7}$ )	Add and subtract fractions with the same denominator (using diagrams)	<p>Add and subtract fractions with the same denominator and denominators that are multiples of the same number (using diagrams) Write mathematical statements <math>&gt; 1</math> as a mixed number</p> <p><math>\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1\frac{1}{5}</math></p> <p>Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams</p>	<p>Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions</p> <p>Multiply simple pairs of proper fractions, writing the answer in its simplest form (using diagrams) (e.g. <math>\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}</math>)</p> <p>Divide proper fractions by whole numbers (using diagrams) (e.g. <math>\frac{1}{3} \div 2 = \frac{1}{6}</math>)</p>
	<b>Percentages</b>			Recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred', and write percentages as a fraction with denominator 100, and as a decimal	Find simple percentages of amounts
	<b>Solving problems involving fractions, decimals and percentages</b>	Solve problems that involve all of the above	<p>Solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number</p> <p>Solve simple measure and money problems involving fractions and decimals to two decimal places</p>	<p>Solve problems involving fractions</p> <p>Solve problems involving number up to three decimal places</p> <p>Solve problems which require knowing percentage and decimal equivalents of <math>\frac{1}{2}</math>, <math>\frac{1}{4}</math>, <math>\frac{1}{5}</math>, <math>\frac{2}{5}</math>, <math>\frac{4}{5}</math> and those with a denominator of 10 or 25</p>	<p>Solve problems involving fractions</p> <p>Solve problems which require answers to be rounded to specified degrees of accuracy</p> <p>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>

		<b>Ratio and proportion</b>			
	<b>Ratio and proportion</b>				<p>Solve problems involving the relative sizes of two quantities where missing values can be found using integer multiplication and division facts</p> <p>Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples</p> <p>Solve problems involving similar shapes where the scale factor is known or can be found</p>
		<b>Algebra</b>			
	<b>Algebra</b>				<p>Express missing number problems algebraically</p> <p>Use simple formulae</p> <p>Generate and describe linear number sequences</p> <p>Find pairs of numbers that satisfy an equation with two unknowns</p> <p>Enumerate possibilities of combinations of two variables</p>
		<b>Measurement (length/height, perimeter, area and mass/weight)</b>			
	<b>Length / height</b>	<p>Measure, add and subtract lengths (m/cm/mm)</p> <p>Compare lengths (m/cm/mm)</p>	<p>Estimate and calculate lengths</p> <p>Compare lengths</p>	<p>Use, read and write standard units of length to a suitable degree of accuracy</p> <p>Understand and use approximate equivalences between metric and common imperial units such as inches</p>	<p>Use, read and write standard units of length using decimal notation to three decimal places</p>
	<b>Perimeter</b>	<p>Understand that perimeter is a measure of distance around the boundary of a shape</p> <p>Measure the perimeter of simple 2-D shapes</p>	<p>Measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres</p>	<p>Measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres</p>	<p>Recognise that shapes with the same areas can have different perimeters and vice versa</p>
	<b>Area</b>		<p>Understand that area is a measure of surface within a given boundary</p> <p>Find the area of rectilinear shapes by counting squares</p>	<p>Calculate and compare the area of rectangles (including squares), and including using standard units, square centimetres (cm<sup>2</sup>) and square metres (m<sup>2</sup>) and estimate the area of irregular shapes</p>	<p>Calculate the area of parallelograms and triangles</p> <p>Recognise when it is possible to use the formulae for area and volume of shapes</p>
	<b>Mass</b>	<p>Measure, add and subtract mass (kg/g)</p> <p>Compare mass (kg/g)</p>	<p>Estimate and calculate mass</p> <p>Compare mass</p>	<p>Use, read and write standard units of mass to a suitable degree of accuracy</p>	<p>Use, read and write standard units of mass using decimal notation to three decimal places</p>



				Understand and use approximate equivalences between metric and common imperial units such as pounds	
		<b>Measurement (capacity, volume, temperature and conversion)</b>			
	<b>Capacity / volume</b>	Measure, add and subtract volume/capacity (l/ml)  Compare volume/capacity (l/ml)	Estimate and calculate volume/capacity  Compare volume/capacity	Estimate (and calculate) volume (for example, using 1 cm <sup>3</sup> blocks to build cuboids (including cubes)) and capacity (for example, using water)  Understand the difference between liquid volume, including capacity and solid volume  Understand and use approximate equivalences between metric and common imperial units such as pints	Use, read and write standard units of volume using decimal notation to three decimal places  Calculate and estimate volume of cubes and cuboids using standard units, including cubic centimetres (cm <sup>3</sup> ) and cubic metres (m <sup>3</sup> ) and extending to other units (for example, mm <sup>3</sup> and km <sup>3</sup> )  Compare volume of cubes and cuboids using standard units, including cubic centimetres (cm <sup>3</sup> ) and cubic metres (m <sup>3</sup> ) and extending to other units (for example, mm <sup>3</sup> and km <sup>3</sup> )
	<b>Temperature</b>	Continue to estimate and measure temperature to the nearest degree (°C) using thermometers	Order temperatures including those below 0°C	Continue to order temperatures including those below 0°C	Calculate differences in temperature, including those that involve a positive and negative temperature
	<b>Conversion</b>		Convert between different units of measure (e.g. kilometre to metre; hour to minute)	Convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre)	Convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to three decimal places  Convert between miles and kilometres
		<b>Measurement (time)</b>			
	<b>Time</b>	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	Convert between different units of time, e.g. hour to minute  Read, write and convert time between analogue and digital 12 and 24-hour clocks	Convert between units of time in a problem solving context  Continue to read, write and convert time between analogue and digital 12 and 24-hour clocks	Use, read and write standard units of time

		<p>Know the number of seconds in a minute, and the number of days in each month, year and leap year</p> <p>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>Estimate and read time with increasing accuracy to the nearest minute</p> <p>Compare durations of events (for example to calculate the time taken by particular events or tasks)</p>			
		<b>Measurement (money and solving problems)</b>			
	<b>Money</b>	<p>Continue to recognise and use symbols for pounds (£) and pence (p) and understand that the decimal point separates pounds and pence</p> <p>Recognise that ten 10p coins are equivalent to £1 and that each coin is 1/10 of £1</p> <p>Add and subtract amounts of money to give change, using both £ and p in practical contexts</p>	<p>Write amounts of money using decimal notation</p> <p>Recognise that one hundred 1p coins are equivalent to £1 and that each coin is 1/100 of £1</p> <p>Estimate, compare and calculate money in pounds and pence</p>		
	<b>Solving problems involving</b>	Solve problems involving money and measures and simple problems involving passage of time	Solve problems involving converting from hours to minutes; minutes to seconds;	Use all four operations to solve problems involving measure (for example, length, mass,	Solve problems involving the calculation and conversion of units of measure (including money and time),

	<b>money and measures</b>		years to months; weeks to days and problems involving money and measures	volume, money) using decimal notation including scaling Solve problems involving converting between units of time	using decimal notation up to three decimal places where appropriate
		<b>Geometry - properties of shapes</b>			
	<b>Properties of shape</b>	<p>Draw 2-D shapes and describe them</p> <p>Identify horizontal and vertical lines and pairs of perpendicular and parallel lines</p> <p>Make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them</p>	<p>Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes</p> <p>Identify lines of symmetry in 2-D shapes presented in different orientations</p> <p>Complete a simple symmetric figure with respect to a specific line of symmetry</p> <p>Continue to identify horizontal and vertical lines and pairs of perpendicular and parallel lines</p> <p>Compare and classify geometric shapes based on their properties and sizes</p>	<p>Distinguish between regular and irregular polygons based on reasoning about equal sides and angles</p> <p>Use the properties of rectangles to deduce related facts and find missing lengths and angles</p> <p>Identify 3-D shapes, including cubes and other cuboids, from 2-D representations</p>	<p>Compare and classify geometric shapes based on their properties and sizes</p> <p>Draw 2-D shapes using given dimensions and angles</p> <p>Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius</p> <p>Recognise, describe and build simple 3-D shapes, including making nets</p>
	<b>Angles and rotation</b>	<p>Recognise angles as a property of shape or a description of a turn</p> <p>Identify right angles, recognise that two right angles make a half-turn, three make three quarters of a turn and four a complete turn; identify whether angles are greater than or less than a right angle</p>	<p>Identify acute and obtuse angles and compare and order angles up to two right angles by size</p>	<p>Know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles</p> <p>Draw given angles, and measure them in degrees (°) Identify:</p> <ul style="list-style-type: none"> <li>- angles at a point and one whole turn (total 360°)</li> <li>- angles at a point on a straight line and 1/2 a turn (total 180°)</li> <li>- other multiples of 90°</li> </ul>	<p>Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles</p> <p>Find unknown angles in any triangles, quadrilaterals, and regular polygons</p>
	<b>Patterns</b>				
	<b>Position and direction</b>				
	<b>Coordinates (including reflection and translation)</b>	<p>Describe positions on a square grid labelled with letters and numbers</p>	<p>Describe positions on a 2-D grid as coordinates in the first quadrant</p> <p>Plot specified points and draw sides to complete a given polygon</p>	<p>Describe positions on the first quadrant of a coordinate grid</p> <p>Plot specified points and complete shapes</p>	<p>Describe positions on the full coordinate grid (all four quadrants)</p> <p>Draw and translate simple shapes on the coordinate plane, and reflect them in the axes</p>

			Describe movements between positions as translations of a given unit to the left/right and up/down	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	
		<b>Statistics</b>			
	<b>Sorting and classifying</b>	Use sorting diagrams to compare and sort objects, numbers and common 2-D and 3-D shapes and everyday objects	Use a variety of sorting diagrams to compare and classify numbers and geometric shapes, including quadrilaterals and triangles, based on their properties and sizes	Complete and interpret information in a variety of sorting diagrams (including those used to sort properties of numbers and shapes)	Continue to complete and interpret information in a variety of sorting diagrams (including those used to sort properties of numbers and shapes)
	<b>Present and interpret data</b>	Interpret and present data using bar charts, pictograms and tables	Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs	Complete, read and interpret information in tables, including timetables	Interpret and construct pie charts and line graphs and use these to solve problems
	<b>Solve problems using data</b>	Solve one-step and two-step questions (for example, 'How many more?' and 'How many fewer?') using information presented in scaled bar charts and pictograms and tables	Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs	Solve comparison, sum and difference problems using information presented in all types of graph including a line graph	Solve comparison, sum and difference problems using information presented in all types of graph
	<b>Averages</b>			Calculate and interpret the mode, median and range	Calculate and interpret the mean as an average

## Approach to Maths

Mastery of maths means a deep, long-term, secure and adaptable understanding of the subject. Developing mastery consists of three main elements:

- Fluency (rapid and accurate recall and application of facts and concepts)
- a growing confidence to reason mathematically
- the ability to apply maths to solve problems, to conjecture and to test hypotheses

Mastery of maths, builds gradually as a child goes through school, is a tool for life, and is more valuable than the short term ability to answer questions in tests or exam. A detailed, structured curriculum is mapped out across all phases, ensuring continuity and supporting transition (appendix 1). An effective mastery curriculum in mathematics is designed in relatively small carefully sequenced steps, which must each be mastered before pupils move to the next stage. Fundamental skills and knowledge are secured first. As a school, we are passionate about children acquiring the basic skills of mathematics that will be valuable to them as they move on to further education and beyond. We give children a reason for their learning so that they understand the real-life context of their learning.

All year groups are using a 'Bronze, Silver, Gold, Platinum' approach to the activities that are set. This system enables the children to either consolidate their understanding of concepts before moving on (usually bronze and silver) or to apply their mathematical skills to reason and problem solve (usually gold and platinum). We are developing elements of whole class teaching, unlike the old model, where advanced learners are accelerated through new content, those pupils who grasp concepts quickly are challenged with rich and sophisticated problems within the topic. Those children who are not sufficiently fluent are provided additional support to consolidate their understanding before moving on.

When walking into a typical maths lesson it is evident that there is a challenging, engaging ethos that promotes a positive and confident attitude to maths as an exciting, creative and relevant subject. We also want to ensure that all our children realise their potential, becoming confident and enthusiastic mathematicians. Our curriculum is designed to ensure that there is a focus on promoting core maths skills; such as multiplication tables, number bonds and place value; as well as practical maths and 'using and applying' skills which promote independent problem solving skills and mastery. We use 'Can you still...?' starters to help to revisit previous learning, which should develop retention of prior learning.

To provide adequate time for developing mathematics, maths is taught daily and discretely. However, application of skills is linked across the curriculum where appropriate.

At Alexandra Junior, we use an exciting, interactive maths programme to teach the children the essential skill of recalling their multiplication and division facts. The national expectation is that every child will be able to answer any times table question or division fact mentally within a five second period. Times Tables Rock Stars is an online programme which allows the children to access multiplication and division questions both at school and at home, whilst listening to rock music to motivate and engage them.

The online programme contains a competitive element where the children collect coins for every answer they input correctly. The more coins they earn, the more accessories they can buy for their avatar and the higher up the school leader board they will go. This resource is accessible and is a fun and engaging

way to learn a vital mathematical skill. We have a half termly school Times Tables Rock Star league, within which the children compete to be the highest earning pupil in order to bring their class to victory over the others, thus engaging more with the programme.

The maths lessons support our school context-based drivers, the 5Es (Excel yourself, Embrace yourself, Explore the world, Engage with others, Express yourself). These are explicitly shared with the children.

## Literacy in Mathematics

### Speaking and Listening

Throughout every maths lesson at Alexandra Junior School, our children have regular opportunities to describe, explain and justify their understanding of mathematical concepts, and practise using precise mathematical vocabulary and they are given opportunities to 'think together', discuss and explore ideas with each other, and share their mathematical reasoning and understanding. The children will be provided with, or develop, STEM sentences to support the retention of key information that they will need to explain their understanding throughout the lesson.

### Reading

Although reading and maths may not seem to be linked a large part of children being able to solve problems is actually being able to understand what the question requires from them. Reading in mathematics involves a range of skills, including visualisation, interpretation, prediction and personal response. Reading skills underpin information processing skills. These enable pupils to find and organise relevant information, to compare and contrast it and to identify and analyse relationships within questions.

### Writing

Children are given the opportunity to write a written explanation as an answer to a question such as 'explain why'. Teachers model as an 'expert' demonstrating how to do something whilst thinking through the process aloud. Teachers use modelling to demonstrate skills, decisions and processes that are normally hidden. As teachers model, they can also demonstrate the need to make alterations and corrections, revise and edit information. Modelling helps pupils to develop the confidence to use these processes themselves in their own work.

### Vocabulary

Each lesson starts with a review of vocabulary that the children will be expected to use within the lesson using the three tiered vocabulary planner and an emphasis will be put on using the correct mathematical vocabulary when sharing answers. Key vocabulary for the four operations can be found in the calculation policy for each year group (appendix 2a, 2b, 2c, 2d)

### Differentiation/SEND

Our maths curriculum ensures provision for all children. Through the use of concrete, pictorial, abstract teaching, children are provided with small steps that will ensure they are able to not only access the skills, but also retain the mathematical understanding to use in future lessons. The use of interventions to provide pre-teaching of vocabulary and reviewing skills from previous teaching enable children to approach new mathematical learning with more confidence.

The Times Table Rock Stars programme also allows the children to be targeted at whichever times table level is appropriate for the children and in the school league, focus is on pupil engagement with the programme rather than pupils being higher attaining.

### Moral/Social and Cultural Development

At Alexandra Junior, we use maths to support our children's spiritual development by helping them to develop deep thinking and question the way in which the world works. Moral development is supported through discussion about mathematical understanding and challenging assumptions, supporting children to question information and data that they are presented with. Self-esteem and building self-confidence is integral to social development and we use growth mind-set, metacognition and our differentiation model to support this. Collaborative learning is encouraged at Alexandra Junior in the form of listening and learning from each other and paired discussion and working with partners.

## Assessment

### Formative Assessment

Assessment is an integral and continuous part of the teaching and learning process and much of it is done informally as part of each teacher's day-to-day work. Teachers integrate the use of formative assessment strategies such as: effective questioning, clear learning objectives, the use of success criteria, effective feedback and response in their teaching and marking especially in the form of live marking, which ensures that any misconceptions are addressed within the lesson and enable the children to be successful in every lesson. Findings from these types of assessment are used to inform future planning. Children sit a bi-weekly arithmetic test, followed by a review session the following week, which enables the teacher to focus on areas of arithmetic weakness.

### Summative Assessment

More formal methods are used to determine the levels of achievement of children at various times during the school year.

Before the assessment point, we use the White Rose termly test to help to inform teacher judgments for the units that have already been taught.

At the end of a term, we use the NTS tests to give a standardised score, allowing for comparison to previous tests and this test also allows the teacher to check for the retention of skills and gives an analysis of gaps for future objectives to be taught.

At the end of the year, we use the GL assessment which provides us with a nationally comparable standardised score.

## Visitors/Trips/Whole school

We engage in city wide times table competitions for years 4 and 5 in order to promote a love of learning their times tables and to give the children a chance to show off their rapid recall of times table facts.

We use Times Table Rock Stars, an online interactive times table resource that the children can use at school and out of school. We have a school league in which every class participates to try to become the class who engages the most in the programme. The score board on the school maths display tells the children how well their class has done and there are certificates presented to the top three contributors in each class.

We hold a yearly real life maths week, which gives the children the opportunity to use learnt mathematical skills in real life situations. This gives children a deeper understanding of why mathematics is important in their life outside our school gates. During this week, children are exposed to careers which are maths based or require an understanding of maths.

At Alexandra Junior, we take part in NSPCC Number day, during which the children are asked to dress up in an outfit containing a number, for example a football shirt. The children will then be asked to carry out various maths activities and challenges using the numbers from their outfits.



