2019-2020 Maths Curriculum: Year 5

Concept *mental fluency*

		Working towards the expected standard	Working at the expected standard	Working above the expected standard
Number & place Value		*Count in multiples of 4, 6, 7, 8, 9, 25 and 1000*	*Count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000*	
		Count backwards through zero to include negative numbers	Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero.	Use negative numbers in practical contexts and solve problems, including calculating intervals across 0.
		Read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of zero and place value	Read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit	Use place value in whole numbers to at least 10 000 000 to read, write, compare and order numbers.
		Find 1000 more or less than a given number	Read roman numerals to 1000 (m) and recognise years written in roman numerals.	Read Roman numerals to 1000 (M).
		Recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones)		Identify the value of each digit in numbers with up to 3 decimal places
		Order and compare numbers beyond 1000		
		Round any number to the nearest 10, 100 or 1000	*Round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000*	*Round any whole number to the nearest 10, 100, 1,000, 10,000, 100,000.*
		Identify, represent and estimate numbers using different representations	**Understand and use various concrete and pictorial representations of numbers (including up to 1000000 and numbers including tenths, hundredths and thousandths (including all of dienes, place value counters and number line)**	Use approximation to estimate and check answers to calculations and determine, in the context of a problem, levels of accuracy
		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.	Solve problems and reason about place value and number.
Addition & Subtraction		Add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate	Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)	Add and subtract whole numbers with more than 4 digits, using formal written methods
			Add and subtract numbers mentally with increasingly large numbers	*Add and subtract numbers mentally with increasingly large numbers*
		Estimate 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, appropriate levels of accuracy.
		Use inverse operations to check answers to a calculation.		Solve addition and subtraction multi-step problems in context.
		Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why.	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.
				Use knowledge of the 4 operations to reason and to solve problems, including puzzles not set in a context.
Multiplication & Division		*Recall multiplication and division facts for multiplication tables up to 12 × 12*	*Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000*	*Use understanding of place value to multiply and divide whole numbers and decimals with up to 3 decimal places by 10, 100 and 1000*
		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	*Recall multiplication and division facts for multiplication tables up to 12 × 12 (drawing upon known facts)*	
			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	*Multiply and divide numbers mentally, drawing upon multiplication facts, including with mixed operations and large numbers*
			Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers.	Perform mental calculations including with mixed operations and large numbers.
			Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers	Fluently multiply numbers up to 4 digits by a 2-digit number using the long multiplication method.
		Multiply two-digit and three-digit numbers by a one-digit number using formal written layout	Establish whether a number up to 100 is prime and recall prime numbers up to 19	Recognise and use: • multiples and factors; • prime numbers to at least 19; and • square numbers, at least up to 144
		Recognise and use factor pairs and commutativity in mental calculations	Recognise and use square numbers and cube numbers, and the notation for squared (2) and cubed (3)	Use estimation to check answers to calculations and determine, in the context of a problem, appropriate levels of accuracy.

		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	Fluently divide numbers with up to 4 digits by a 1-digit number using the formal written method.
	Solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as 'n' objects are connected to 'm' objects.	Solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes	Use long division with 2-digit divisors.
			Interpret remainders according to the context
		Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign	Solve problems involving addition, subtraction, multiplication and division.
		Solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates	Use knowledge of the 4 operations to reason and to solve problems, including puzzles not set in a context.
Fractions	*Count up and down in tenths & hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten.*	Read and write decimal numbers as fractions [for example, 0.71 =71/100]	Multiply one-digit numbers with up to 2 decimal places by whole numbers.
	Use number bonds inside 20 knowledge to calculate addition and subtraction facts for tenths inside 2.0 (e.g. 0.8 + 0.7 = 1.5)	Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents.	
	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	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	Recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred'.
	Compare numbers with the same number of decimal places up to two decimal places	Recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number [for example, 2/5 + 4/5 = 6/5 = 1 1/5]	Use common factors to: • simplify fractions; • identify equivalent fractions, using common multiples to express fractions in the same denomination.
		Compare and order fractions whose denominators are all multiples of the same number	
		Read, write, order and compare numbers up to three decimal places	
	Round decimals with one decimal place to the nearest whole number	*Round decimals with two decimal places to the nearest whole number and to one decimal place*	
	Recognise and write decimal equivalents to 1/4, 1/2 ,3/4	Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths	Recall and use equivalences between simple fractions, decimals and percentages, in different contexts.
	Recognise and show, using diagrams, families of common equivalent fractions		Associate a fraction with division and begin to calculate decimal fraction equivalents.
	Add and subtract fractions with the same denominator	Add and subtract fractions with the same denominator and denominators that are multiples of the same number	Add and subtract fractions with denominators that are multiples of the same number.
		Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams	Calculate simple fractions and percentages of whole numbers and quantities.
	Solve simple measure and money problems involving fractions and decimals to two decimal places.	Solve problems involving number up to three decimal places	Use written division methods in cases where the answer has up to 2 decimal places.
	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	Solve problems which require knowing percentage and decimal equivalents of ½ , ¼, 1/5, 2/5, 4/5 and those fractions with a denominator of a multiple of 10 or 25.	Solve problems and reason about fractions, decimals and percentages.
Measurement	Solve problems involving money of the same unit, including giving change, and other measures, including time.	Solve problems involving converting between units of time	Solve problems involving converting units of time, including problems involving the duration of events.
	Convert between different units of measure (for example, 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)	Use, read, write and convert between standard metric units of measure.
		Understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints	
	Measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres	Measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres	Measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres.
	Find the area of rectilinear shapes by counting squares	Calculate and compare the area of rectangles (including squares), and	Recognise that shapes with the same areas can have different perimeters

	Column 1	Column 2	Column 3
		including using standard units, square centimetres (cm2) and square metres (m2) and estimate the area of irregular shapes	and vice versa.
	Estimate, compare and calculate different measures, including money in pounds and pence.	Estimate volume [for example, using 1 cm3 blocks to build cuboids (including cubes)] and capacity [for example, using water]	Calculate and compare the area of squares and other rectangles including using standard units, square centimetres (cm2) and square metres (m2).
			Estimate the area of irregular shapes by counting squares (including half squares and fractions of squares).
	Read, write and convert time between analogue and digital 12 and 24 hour clocks		Read, write and convert time between analogue clocks (including clock faces using Roman numerals) and digital 12- and 24-hour clocks, using am and pm where necessary.
			Reason and solve problems involving measures.
	Solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days	Use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling.	Solve problems involving the calculation and conversion of units of measure, using decimal notation up to 3 decimal places where appropriate.
R & P			Use simple ratio and proportional reasoning to solve problems.
			Solve problems involving similar shapes where the scale factor is known or can be found.
Algebra			Use simple formulae in words, and express missing number problems algebraically.
			Generate and describe linear number sequences
			Find possible values in missing number problems and equations involving 1 or 2 unknowns.
Shape	Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes (including perpendicular and parallel lines, acute, obtuse and right angles)	Identify 3-D shapes, including cubes and other cuboids, from 2-D representations	Compare and classify geometric shapes based on their properties and sizes.
		Use the properties of rectangles to deduce related facts and find missing lengths and angles	Recognise, describe and build simple 3-D shapes, including using nets and other 2-D representations.
	Identify lines of symmetry in 2-d shapes presented in different orientations	Distinguish between regular and irregular polygons based on reasoning about equal sides and angles	Draw 2-D shapes using given lengths and angles with increasing accuracy.
	Complete a simple symmetric figure with respect to a specific line of symmetry.		Illustrate and describe parts of circles including radius, diameter and circumference.
	Identify acute and obtuse angles and compare and order angles up to two right angles by size	Know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles	Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles.
		Draw given angles, and measure them in degrees (o) Identify: • Angles at a point and one whole turn (total 360o) • Angles at a point on a straight line and a turn (total 180°) • Other multiples of 90°	Find unknown angles in triangles.
	Solve problems involving shapes and reason about their properties.	Solve problems involving shapes and reason about their properties	Solve problems and reason about shapes and their properties.
P&D	Describe positions on a 2-D grid as coordinates in the first quadrant	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.	Describe positions of a 2-D grid as co-ordinates in the first quadrant.
	Describe movements between positions as translations of a given unit to the left/right and up/down		Draw and translate simple shapes on the co-ordinate plane in the first quadrant
	Plot specified points and draw sides to complete a given polygon		Use reasoning to solve problems related to co-ordinates, reflections and translations.
Statistics	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.	Present, complete, read and interpret information in tables and bar charts
	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 a line graph	Construct and interpret line graphs, interpret pie charts and use both to solve problems.
			Calculate and interpret the mean as an average for simple sets of discrete data in different contexts.