MATHEMATICS

YEAR 5 & 6

NUMBER & PLACE VALUE

Year 5	Year 6
Read, write, order and compare numbers up to one million and determine the value of each digit.	Read, write, order and compare numbers up to ten million and determine the value of each digit.
Interpret negative numbers in a context. Count forwards and backwards with positive and negative whole numbers, including through zero.	Use negative numbers in context and calculate intervals across zero.
Round any number up to one million to the nearest 10, 100, 1000, 10000 and 100000.	Round any whole number to a required degree of accuracy.
Count forwards or backwards in steps of powers of 10 for any given number up to one million.	
Read Roman numerals to 1,000 (M) and recognise years written in Roman numerals.	
Recognise and describe linear number sequences, including those involving fractions and decimals, and find the term-to-term rule.	
Use number in context, including measurement.	Use the whole number system, including saying, reding and writing numbers accurately.
Solve number problems and practical problems that involve all the above.	

ADDITION & SUBTRACTION

Year 5	Year 6
Add and subtract whole numbers with more than 4 digits, using formal written methods (columnar).	
Add and subtract numbers mentally with increasingly large numbers.	Undertake mental calculations with increasingly large numbers and more complex calculations.
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.
Solve problems involving addition and subtraction or a combination of these, including understanding the meaning of the equals sign.	
Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.	

MULTIPLICATION & DIVISION

Year 5	Year 6
Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers.	Identify common factors, common multiples and prime numbers. Understand common factors can be related to finding equivalent fractions.
Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers.	
Establish whether a number up to one hundred is prime and recall prime numbers up to nineteen.	
Multiply a four-digit number by a one or two-digit number using a formal written method, including long multiplication for two-digit numbers.	Multiply a four-digit number by a two-digit number using a formal written method, including long multiplication for two-digit numbers.
Multiply and divide numbers mentally, drawing upon known facts.	Perform mental calculations, including with mixed operations and large numbers.
Divide four-digit numbers by a one-digit numbers, using the formal written method of short division and interpret remainders appropriately for the context.	Divide four-digit numbers by two-digit numbers using the formal written method of short division where appropriate, interpreting remainders according to the context Divide four-digit numbers by two-digit whole numbers using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context.
Multiply and divide whole and decimal numbers by 10, 100 and 1000.	
Recognise and use square numbers and cube numbers, and the notation for squared (^{2}) and cubed (^{3}).	
Solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes.	Solve problems involving multiplication and division.
Solve problems involving multiplication and division or 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.	
Apply multiplication tables and related division facts frequently, commit them to memory and use them confidently to make larger calculations.	Use all the multiplication tables to calculate mathematical statements to maintain fluency.
Interpret non-integer answers to division by expressing results in different ways according to the context, including with remainders, as fractions, as decimals or by rounding.	
Use multiplication and division as inverses to support the introduction of ratio in Year 6.	
Understand distributivity can be expressed as $a(b + c) = ab + ac$.	
Understand the terms factor, multiple and prime, square and cube numbers and use them to construct equivalence statements.	
Use and explain the equals sign to indicate equivalence, including in missing number problems.	
	Pupils explore the order of operations using brackets; for example, 2 + 1 x 3 = 5 and (2 + 1) x 3 = 9.
Use their knowledge of the order of operations to carry out calculations involving the four operations.	

FRACTIONS

Year 5	Year 6
Compare and order fractions whose denominators are multiples of the same number.	Use common factors to simplify fractions; use common multiples to express fractions in the same denomination. Compare and order fractions, including fractions less than one.
Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths.	
Recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements less than 1 as a mixed number.	
Add and subtract fractions with the same denominator and denominators that are multiples of the same number.	Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions.
Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams.	Multiply simple pairs of proper fractions, writing the answer in its simplest form. Multiply one-digit numbers with up to two decimal places by whole numbers.
Read and write decimal numbers as fractions.	Identify the value of each digit in numbers given to three decimal places and multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places.
Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents.	Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.
Round decimals with two decimal places to the nearest whole number and to one decimal place.	Solve problems which require answers to be rounded to specified degrees of accuracy.
Read, write, order and compare numbers with up to three decimal places.	
Solve problems involving number up to three decimal places.	
Recognise the % symbol and understand that it relates to 'number of parts per hundred'. Write percentages as a fraction with denominator 100, and as a decimal.	
Solve problems which require knowing percentage and decimal equivalents and those fractions with a denominator of a multiple of 10 or 25.	
Practise counting forwards and backwards in simple fractions.	
Say, read and write decimal fractions and related tenths, hundredths and thousandths accurately.	
Mentally add and subtract tenths, and one-digit whole numbers and tenths.	
Practise adding and subtracting decimals, including a mix of whole numbers and decimals, decimals with different numbers of decimal places, and complements of 1.	
	Divide proper fractions by whole numbers. Associate a fraction with division and calculate decimal fraction equivalents. Use written division methods in cases where the answer has up to two decimal places.

MEASUREMENT

Year 5	Year 6
Convert between different units of metric measure.	Solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate.
Understand and use approximate equivalences between metric units and common imperial units.	Use, read, write and 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 up to three decimal places.
Measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres.	
Calculate and compare the area of rectangles and including using standard units, square centimetres (cm^2) and square metres (m^2). Estimate the area of irregular shapes.	Recognise that shapes with the same areas can have different perimeters and vice versa. Recognise when it is possible to use formulae for area and volume of shapes. Calculate the area of parallelograms and triangles.
Estimate volume and capacity.	Calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm^3) and cubic metres (m^3), and extending to other units [for example, mm^3 and km^3].
Solve problems involving converting between units of time.	
Use all four operations to solve problems involving measure using decimal notation, including scaling.	
Use knowledge of place value and multiplication and division to convert between standard units.	
Use all four operations in problems involving time and money, including conversions.	
	Convert between miles and kilometres.
	Introduce compound units for speed, such as miles per hour, and apply their knowledge in science or other subjects as appropriate.

POSITION & DIRECTION

Year 5	Year 6
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 on the full coordinate grid (all four quadrants).
Recognise and use reflection and translation in a variety of diagrams, including continuing to use a 2-D grid and coordinates in the first quadrant.	Draw and translate simple shapes on the coordinate plane and reflect them in the axes.

SHAPE

Year 5	Year 6
Identify 3-D shapes from 2-D representations.	Draw 2-D shapes using given dimensions and angles. Recognise, describe and build simple 3-D shapes, including making nets.
Know angles are measured in degrees. Estimate and compare acute, obtuse and reflex angles.	
Draw given angles and measure them in degrees.	Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons.
Identify angles at a point and one whole turn. Identify angles at a point on a straight line and half a turn	Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles.
Use the properties of rectangles to deduce related facts and find missing lengths and angles.	Describe the properties of shapes and explain how unknown angles and lengths can be derived from known measurements.
Distinguish between regular and irregular polygons based on reasoning about equal sides and angles.	
Draw lines with a ruler to the nearest millimetre. Measure with a protractor.	
Pupils use angle sum facts and other properties to make deductions about missing angles and relate these to missing number problems.	
	Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius.

STATISTICS

Year 5	Year 6
Solve comparison, sum and difference problems using information presented in a line graph.	Interpret and construct pie charts and line graphs and use these to solve problems.
complete, read and interpret information in tables, including timetables.	
Connect work on coordinates and scales to the interpretation of time graphs.	Connect work on angles, fractions and percentages to the interpretation of pie charts.
Begin to decide which representations of data are most appropriate and why.	Encounter and draw graphs relating two variables, arising from their own enquiry and in other subjects.
	Calculate and interpret the mean as an average. Know when it is appropriate to find the mean of a data set.

RATIO & PROPORTION

Year 5	Year 6
	Solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts.
	Solve problems involving the calculation of percentages and the use of percentages for comparison.
	Solve problems involving similar shapes where the scale factor is known or can be found.
	Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples.

ALGEBRA

Year 5	Year 6
	Use simple formulae.
	Generate and describe linear number sequences.
	Express missing number problems algebraically.
	Find pairs of numbers that satisfy an equation with two unknowns.
	Enumerate possibilities of combinations of two variables.