

Addition and subtraction

Year 5	Year 6
Mental calculation	
add and subtract numbers mentally with increasingly large numbers	perform mental calculations, including with mixed operations and large numbers
	use their knowledge of the order of operations to carry out calculations involving the four operations
Written methods	
add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)	
Inverse operations, checking and estimating answers	
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, levels of accuracy.
Problem solving	
solve addition and subtraction multi-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

Algebra

Year 5	Year 6
Equations	
<i>use the properties of rectangles to deduce related facts and find missing lengths and angles</i> (copied from Geometry: Properties of Shapes)	express missing number problems algebraically
	find pairs of numbers that satisfy number sentences involving two unknowns
	enumerate all possibilities of combinations of two variables
Formulae	
	use simple formulae
	<i>recognise when it is possible to use formulae for area and volume of shapes</i> (copied from Measurement)
Sequences	
	generate and describe linear number sequences

Fractions (including decimals and percentages)

Year 5	Year 6
Recognising fractions	
recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents (appears also in Equivalence)	
Comparing fractions	
compare and order fractions whose denominators are all multiples of the same number	compare and order fractions, including fractions >1
Comparing decimals	
read, write, order and compare numbers with up to three decimal places	identify the value of each digit in numbers given to three decimal places
Rounding including decimals	
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
Equivalence (including fractions, decimals and percentages)	
identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths	use common factors to simplify fractions; use common multiples to express fractions in the same denomination
read and write decimal numbers as fractions (e.g. $0.71 = \frac{71}{100}$)	associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. $\frac{3}{8}$)
recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents	
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 as a decimal fraction	recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.
Addition and subtraction of fractions	
add and subtract fractions with the same denominator and multiples of the same number	add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions
recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number (e.g. $\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1\frac{1}{5}$)	
Multiplication and division of 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 (e.g. $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$)
	multiply one-digit numbers with up to two decimal places by whole numbers
	divide proper fractions by whole numbers (e.g. $\frac{1}{3} \div 2 = \frac{1}{6}$)
Multiplication and division of decimals	
	multiply one-digit numbers with up to two decimal places by whole numbers

	multiply and divide numbers by 10, 100 and 1000 where the answers are up to three decimal places
	identify the value of each digit to three decimal places and multiply and divide numbers by 10, 100 and 1000 where the answers are up to three decimal places
	associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. $\frac{3}{8}$)
	use written division methods in cases where the answer has up to two decimal places
Problem solving	
solve problems involving numbers up to three decimal places	
solve problems which require knowing percentage and decimal equivalents of $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{5}$, $\frac{2}{5}$, $\frac{4}{5}$ and those with a denominator of a multiple of 10 or 25.	

Geometry: position and direction

Year 4	Year 5
Position, direction and movement	
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)
	draw and translate simple shapes on the coordinate plane, and reflect them in the axes.

Geometry: properties of shapes

Year 4	Year 5
Identifying shapes and their properties	
identify 3-D shapes, including cubes and other cuboids, from 2-D representations	recognise, describe and build simple 3-D shapes, including making nets (appears also in Drawing and Constructing)
	illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius
Drawing and constructing	
draw given angles, and measure them in degrees ($^{\circ}$)	draw 2-D shapes using given dimensions and angles
	recognise, describe and build simple 3-D shapes, including making nets (appears also in Identifying Shapes and Their Properties)
Comparing and classifying	
use the properties of rectangles to deduce related facts and find missing lengths and angles	compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons
distinguish between regular and irregular polygons based on reasoning about equal sides and angles	
Angles	
know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles	
identify: <ul style="list-style-type: none"> * angles at a point and one whole turn (total 360°) * angles at a point on a straight line and $\frac{1}{2}$ a turn (total 180°) * other multiples of 90° 	recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles

Measurement

Year 4	Year 5
Comparing and estimating	
calculate and compare the area of squares and rectangles including using standard units, square centimetres (cm ²) and square metres (m ²) and estimate the area of irregular shapes (also included in measuring)	calculate, estimate and compare volume of cubes and cuboids using standard units, including centimetre cubed (cm ³) and cubic metres (m ³), and extending to other units such as mm ³ and km ³ .
estimate volume (e.g. using 1 cm ³ blocks to build cubes and cuboids) and capacity (e.g. using water)	
Measuring and calculating	
use all four operations to solve problems involving measure (e.g. 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 three decimal places where appropriate (appears also in Converting)
measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres	recognise that shapes with the same areas can have different perimeters and vice versa
calculate and compare the area of squares and rectangles including using standard units, square centimetres (cm ²) and square metres (m ²) and estimate the area of irregular shapes <i>recognise and use square numbers and cube numbers, and the notation for squared (²) and cubed (³)</i> (copied from Multiplication and Division)	calculate the area of parallelograms and triangles
	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 [e.g. mm ³ and km ³].
	recognise when it is possible to use formulae for area and volume of shapes
Telling the time	
solve problems involving converting between units of time	
Converting	
convert between different units of metric measure (e.g. kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre)	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
solve problems involving converting between units of time	solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate (appears also in Measuring and Calculating)
understand and use equivalences between metric units and common imperial units such as inches, pounds and pints	convert between miles and kilometres

Multiplication and division

Year 4	Year 5
Multiplication and division facts	
count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000 (copied from Number and Place Value)	
Mental calculation	
multiply and divide numbers mentally drawing upon known facts	perform mental calculations, including with mixed operations and large numbers
multiply and divide whole numbers and those involving decimals by 10, 100 and 1000	<i>associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. $\frac{3}{8}$)</i> (copied from Fractions)
Written calculation	
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 multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication
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	divide numbers up to 4-digits by a two-digit whole number using the formal written method of short division where appropriate for the context divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context
	<i>use written division methods in cases where the answer has up to two decimal places</i> (copied from Fractions (including decimals))
Properties of numbers: multiples, factors, primes, square and cube numbers	
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
know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers	<i>use common factors to simplify fractions; use common multiples to express fractions in the same denomination</i> (copied from Fractions)
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)	<i>calculate, estimate and compare volume of cubes and cuboids using standard units, including centimetre cubed (cm^3) and cubic metres (m^3), and extending to other units such as mm^3 and km^3</i> (copied from Measures)
Order of operations	
	use their knowledge of the order of operations to carry out calculations involving the four operations
Inverse operations, estimating and checking answers	
	use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy
Problem solving	

solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes	solve problems involving addition, subtraction, multiplication and division
solve problems involving addition, subtraction, 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	<i>solve problems involving similar shapes where the scale factor is known or can be found</i> (copied from Ratio and Proportion)

Place value

Year 4	Year 5
Counting	
interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero	use negative numbers in context, and calculate intervals across zero
count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000	
Comparing numbers	
read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit (appears also in Reading and Writing Numbers)	read, write, order and compare numbers up to 10 000 000 and determine the value of each digit (appears also in Reading and Writing Numbers)
Reading and writing numbers	
read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit (appears also in Comparing Numbers)	read, write, order and compare numbers up to 10 000 000 and determine the value of each digit (appears also in Understanding Place Value)
read Roman numerals to 1000 (M) and recognise years written in Roman numerals.	
Understanding place value	
read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit (appears also in Reading and Writing Numbers)	read, write, order and compare numbers up to 10 000 000 and determine the value of each digit (appears also in Reading and Writing Numbers)
<i>recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents (copied from Fractions)</i>	<i>identify the value of each digit to three decimal places and multiply and divide numbers by 10, 100 and 1000 where the answers are up to three decimal places (copied from Fractions)</i>
Rounding	
round any number up to 1 000 000 to the nearest 10, 100, 1 000, 10 000 and 100 000	round any whole number to a required degree of accuracy
<i>round decimals with two decimal places to the nearest whole number and to one decimal place (copied from Fractions)</i>	<i>solve problems which require answers to be rounded to specified degrees of accuracy (copied from Fractions)</i>
Problem solving	
solve number problems and practical problems that involve all of the above	solve number and practical problems that involve all of the above

Statistics

Year 4	Year 5
Interpreting, constructing and presenting data	
complete, read and interpret information in tables, including timetables	interpret and construct pie charts and line graphs and use these to solve problems
Solving problems	
solve comparison, sum and difference problems using information presented in a line graph	calculate and interpret the mean as an average

Ratio and proportion

Year 4	Year 5
Statements only appear in year 4 but should be connected to previous learning, particularly fractions and multiplication and division	
	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 [for example, of measures, and such as 15% of 360] 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.