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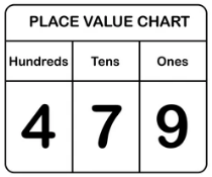
	Year 5	Year 6
Number and Place Value 	• read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit • count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000	• read, write, order and compare numbers up to 10 000 000 and determine the value of each digit
	• interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero • round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000	• use negative numbers in context, and calculate intervals across zero • round any whole number to a required degree of accuracy
	• solve number problems and practical problems that involve all of the above • read Roman numerals to 1000 (M) and recognise years written in Roman numerals.	• solve number and practical problems that involve all of the above.

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	Year 5	Year 6
Addition, subtraction 	• add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) • add and subtract numbers mentally with increasingly large numbers • use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy • 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

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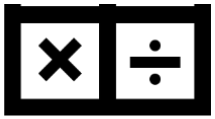
	Year 5	Year 6
Multiplication and Division 	• multiply numbers up to **4 digits by a one- or two-digit** number using a formal written method, including long multiplication for two-digit numbers	• multiply **multi-digit numbers up to 4 digits by a two-digit whole number** using the formal written method of long
	• 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 **long division**, and interpret **remainders as whole number** remainders, **fractions,** or by **rounding**, as appropriate for the context • 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
	• multiply and divide numbers **mentally** drawing upon **known facts** • **multiply and divide whole numbers** and those involving decimals by **10, 100 and 1000**	• 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

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	• identify **multiples and factors**, including finding all **factor pairs** of a number, and **common factors** of two numbers • know and use the vocabulary of **prime numbers, prime factors and composite (non- prime) numbers** • 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}) • 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 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.	• identify **common factors, common multiples and prime numbers** • solve problems involving addition, subtraction, multiplication and division • use **estimation to check** answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.

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	Year 5	Year 6
Fractions, Decimals and Percentages 	<u>Fractions</u> • **compare and order** fractions whose denominators are all multiples of the same number • 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 > 1 as a mixed number [for example, $\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1\frac{1}{5}$] • **add and subtract** fractions with the same denominator and denominators that are multiples of the same number • **multiply** proper fractions and mixed numbers by whole numbers, supported by materials and diagrams	<u>Fractions</u> • **compare and order fractions**, including fractions > 1 • use common factors to **simplify fractions**; use common multiples to express fractions in the same denomination • **add and subtract** fractions with different denominators and mixed numbers, using the concept of equivalent fractions • **multiply** simple pairs of proper fractions, writing the answer in its simplest form [for example, $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$] • **divide** proper fractions by whole numbers [for example, $\frac{1}{3} \div 2 = \frac{1}{6}$]

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	<u>Decimals</u> • read and write decimal numbers as fractions [for example, 0.71 = $\frac{71}{100}$] • recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents • **round** decimals with two decimal places to the nearest whole number and to one decimal place • read, write, order and compare numbers with up to three decimal places • solve problems involving number up to three decimal places	• associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example, $\frac{3}{8}$] <u>Decimals</u> • 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 • **multiply** one-digit numbers with up to two decimal places by whole numbers • use written **division methods** in cases where the answer has up to two decimal places • solve problems which require answers to be rounded to specified degrees of accuracy Pupils multiply and divide numbers with up to two decimal places by one-digit and two-digit whole numbers. Pupils multiply decimals by whole numbers, starting with the simplest cases, such as 0.4 × 2 = 0.8, and in practical contexts, such as measures and money. Pupils also develop their skills of rounding and estimating as a means of predicting and checking the order of magnitude of their answers to decimal calculations. This includes rounding answers to a specified degree of accuracy and checking the reasonableness of their answers.

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	<u>Percentages</u> • 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 • 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 fractions with a denominator of a multiple of 10 or 25.	<u>Percentages</u> recall and **use equivalences** between simple fractions, decimals and percentages, including in different contexts
Ratio and Proportion 		• 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.

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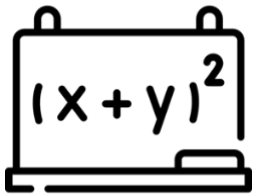
	Year 5	Year 6
Algebra 		• use simple formulae generate and describe linear number sequences express missing number problems algebraically find pairs of numbers that satisfy an equation with two unknowns • enumerate possibilities of combinations of two variables Pupils should be introduced to the use of symbols and letters to represent variables and unknowns in mathematical situations that they already understand, such as: ♣ missing numbers, lengths, coordinates and angles ♣ formulae in mathematics and science ♣ equivalent expressions (for example, *a* + *b* = *b* + *a*) ♣ generalisations of number patterns ♣ number puzzles (for example, what two numbers can add up to).

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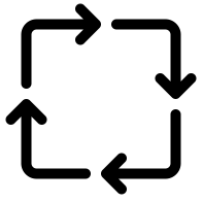
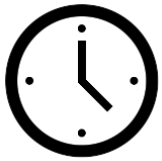
Measurement  \  	• **convert** between different units of **metric measure** (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre) • understand and use approximate **equivalences between metric units and common imperial units** such as **inches, pounds and pints** <u>Area, Perimeter and Volume</u> • measure and calculate the **perimeter of composite rectilinear shape**s in centimetres and metres • calculate and compare the **area of rectangles** (including squares), and including using standard units, square centimetres (cm^2) and square metres (m^2) and **estimate the area of irregular shapes** • estimate **volume** [for example, using 1 cm^3 blocks to build cuboids (including cubes)] and capacity [for example, using water] • 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 • **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 • convert between **miles and kilometres** <u>Area, Perimeter and Volume</u> • 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** • 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]. Pupils connect conversion (for example, from kilometres to miles) to a graphical representation as preparation for understanding linear/proportional graphs.

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	• use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling.	Using the number line, pupils use, add and subtract positive and negative integers for measures such as temperature.. Pupils could be introduced to compound units for speed, such as miles per hour, and apply their knowledge in science or other subjects as appropriate.

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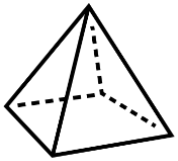
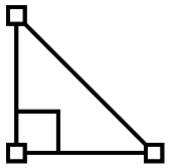
	Year 5	Year 6
Geometry Properties of shape  	• identify **3-D shapes**, including cubes and other cuboids, **from 2-D representations** • distinguish between **regular and irregular polygons** based on reasoning about equal sides and angles. Angles • know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles • draw given angles, and measure them in degrees (^{o}) • identify: -**angles at a point** and one whole turn (total 360^{o}) -angles at a point on a **straight line** and $\frac{1}{2}$ a turn (total 180^{o}) ♣ other multiples of 90^{o} • use the properties of rectangles to deduce related facts and **find missing lengths and angles** Pupils become accurate in drawing lines with a ruler to the **nearest millimetre**, and measuring with a protractor. They use **conventional markings for parallel lines and right angles.** Pupils use the term **diagonal** and make conjectures about the angles formed between sides, and between diagonals and parallel sides, and other properties of quadrilaterals.	• recognise, describe and build simple 3-D shapes, including **making nets** Pupils draw shapes and nets accurately, using measuring tools and **conventional markings and labels for lines and angles.** • **compare and classify** geometric shapes based on their properties and sizes Angles • recognise angles where they meet **at a point**, are on a straight line, or are vertically opposite, and **find missing angles.** • draw 2-D shapes using given dimensions and angles • **find unknown angles** in any triangles, quadrilaterals, and regular polygons • illustrate and **name parts of circles**, including radius, diameter and circumference and know that the diameter is twice the radius

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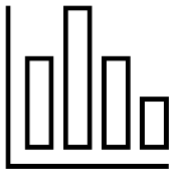
	Year 5	Year 6
Geometry Position and direction 	• identify, describe and represent the position of a shape following **a reflection** or **translation**, using the appropriate language, and know that the shape has not changed NB: coordinates in the first quadrant. Reflection should be in lines that are parallel to the axes	• 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 Pupils draw and label rectangles (including squares), parallelograms and rhombuses, specified by coordinates in the four quadrants, predicting missing coordinates using the properties of shapes. These might be expressed algebraically for example, translating vertex (a, b) to ($a - 2$, $b + 3$); (a, b) and ($a + d$, $b + d$) being opposite vertices of a square of side d.
Statistics 	• solve comparison, sum and difference problems using information presented in a **line graph** • complete, read and interpret information in **tables**, including timetables.	• interpret and construct **pie charts** and **line graphs** and use these to solve problems • calculate and interpret the **mean** as an average. They should connect conversion from kilometres to miles in measurement to its graphical representation.