



	By the end of Year 5 children should be able to...	By the end of of year 6 children should be able to...	At mastery Level in Year 6 Children Should be able to...
Number and Place Value	<ul style="list-style-type: none"> ■ count in multiples of 6, 7, 9, 25 and 1000 ■ find 1000 more or less than a given number ■ count backwards through zero to include negative numbers ■ recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones) ■ order and compare numbers beyond 1000 ■ identify, represent and estimate numbers using different representation ■ round any number to the nearest 10, 100 or 1000 ■ solve number and practical problems that involve all of the above and with increasingly large positive numbers ■ 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. ■ become fluent in the order and place value of numbers beyond 1000, including counting in tens and hundreds, and maintaining fluency in other multiples through varied and frequent practice ■ begin to extend knowledge of the number system to include the decimal numbers and fractions met so far ■ connect estimation and rounding numbers to the use of measuring instruments put Roman numerals in their historical context to understand that there have been different ways to write whole numbers and that the important concepts of zero and place value were introduced over a period of time 	<ul style="list-style-type: none"> ■ read, write, order and compare numbers up to 10 000 000 and determine the value of each digit ■ round any whole number to a required degree of accuracy ■ use negative numbers in context, and calculate intervals across zero ■ solve number and practical problems that involve all of the above ■ use the whole number system, including saying, reading and writing numbers accurately. ■ read, write, order and compare numbers up to 10 000 000 and determine the value of each digit ■ round any whole number to a required degree of accuracy ■ use negative numbers in context, and calculate intervals across zero ■ solve number and practical problems that involve all of the above ■ use the whole number system, including saying, reading and writing numbers accurately. 	<ul style="list-style-type: none"> ■ Compare and order integers and decimals in different contexts

2(Year 6)

Addition and subtraction	<ul style="list-style-type: none"> ■ 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 practise using the formal written methods of columnar addition and subtraction with increasingly large numbers to aid fluency practise mental calculations with increasingly large numbers to aid fluency (for example, $12\ 462 - 2300 = 10\ 162$). 	<ul style="list-style-type: none"> ■ perform mental calculations, including with mixed operations and large ■ use knowledge of the order of operations to carry out calculations involving the four operations ■ solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why ■ solve problems involving all four operations ■ use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy ■ practise addition and subtraction for larger numbers, using the formal written methods of columnar addition and subtraction ■ undertake mental calculations with increasingly large numbers and more complex calculations ■ round answers to a specified degree of accuracy, for example, to the nearest 10, 20, 50 etc., but not to a specified number of significant figures ■ explore the order of operations using brackets; for example, $2 + 1 \times 3 = 5$ and $(2 + 1) \times 3 = 9$ 	<ul style="list-style-type: none"> • Understand how the commutative, associative and distributive laws and how the relationships between operations, including inverse operations, can be used to calculate more efficiently; • use the order of operations, including brackets Consolidate and extend mental methods of calculation to include decimals, fractions and percentages • Use standard column procedures to add and subtract integers and decimals, and to multiply two digit and three digit integers by a one digit or two digit integer; extend division to dividing three digit integers by a two digit integer • Calculate percentage increases or decreases and fractions of quantities and measurements (integer answers) • Use bracket keys and the memory of a calculator to carry out calculations with more than one step; use the square root key
Multiplication and division	<ul style="list-style-type: none"> ■ apply all the multiplication tables and related division facts frequently, commit them to memory and use confidently to make larger calculations ■ recognise and use square numbers and cube numbers, and the notation for squared (2) and cubed (3) ■ use and understand the terms: factor; multiple; square number ; 	<ul style="list-style-type: none"> ■ use knowledge of the order of operations to carry out calculations involving the four operations ■ 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 two-digit whole number using the formal written method of long division, and 	<ul style="list-style-type: none"> • Understand how the commutative, associative and distributive laws and how the relationships between operations, including inverse operations, can be used to calculate more efficiently; • use the order of operations, including brackets Consolidate and extend mental methods of calculation to include decimals, fractions and percentages

3(Year 6)

	<ul style="list-style-type: none"> ■ identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers ■ establish whether a number up to 100 is prime and recall prime numbers up to 19 ■ 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 known facts ■ 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 and divide whole numbers and those involving decimals by 10, 100 and 1000 ■ solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates ■ 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 (for example, $98 \div 4 = \frac{98}{4} = 24 \text{ r } 2 = 24 \frac{1}{2} = 24.5 \approx 25$) 	<p>interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context</p> <ul style="list-style-type: none"> ■ identify common factors, common multiples and prime numbers ■ practise multiplication and division for larger numbers, using the formal written methods of short and long multiplication, and short and long division ■ undertake mental calculations with increasingly large numbers and more complex calculations ■ continue to use all the multiplication tables to calculate mathematical statements in order to maintain their fluency ■ round answers to a specified degree of accuracy, for example, to the nearest 10, 20, 50 etc., but not to a specified number of significant figures ■ use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy ■ explore the order of operations using brackets; for example, $2 + 1 \times 3 = 5$ and $(2 + 1) \times 3 = 9$ ■ common factors are related to finding equivalent fractions ■ solve problems involving multiplication and division 	<ul style="list-style-type: none"> ● Use standard column procedures to add and subtract integers and decimals, and to multiply two digit and three digit integers by a one digit or two digit integer; extend division to dividing three digit integers by a two digit integer ● Calculate percentage increases or decreases and fractions of quantities and measurements (integer answers) ● Use bracket keys and the memory of a calculator to carry out calculations with more than one step; use the square root key
--	---	---	---

4(Year 6)

Fractions	<ul style="list-style-type: none"> ■ make connections between fractions of a length, of a shape and as a representation of one whole or set of quantities and use factors and multiples to recognise equivalent fractions and simplify where appropriate (for example, $\frac{6}{9} = \frac{2}{3}$ or $\frac{1}{4} = \frac{2}{8}$) ■ continue to practise adding and subtracting fractions with the same denominator, to become fluent through a variety of increasingly complex problems beyond one whole ■ understand that decimals and fractions are different ways of expressing numbers and proportions ■ practise counting using simple fractions and decimals, both forwards and backwards ■ 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 [Eg. $\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1\frac{1}{5}$] ■ add and subtract fractions with the same denominator and denominators that are multiples of the same number ■ 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 	<ul style="list-style-type: none"> ■ use common factors to simplify fractions and use common multiples to express fractions in the same denomination ■ compare and order fractions, including fractions > 1 ■ 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 [Eg. $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$] ■ divide proper fractions by whole numbers [Eg. $\frac{1}{3} \div 2 = \frac{1}{6}$] ■ associate a fraction with division and calculate decimal fraction equivalents [Eg. 0.375] for a simple fraction [Eg. $\frac{3}{8}$] ■ 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 ■ recall and use equivalences between simple fractions, decimals and percentages, including in different contexts 	<ul style="list-style-type: none"> • Compare and order integers and decimals in different contexts • Order a set of fractions by converting them to decimals • Recognise approximate proportions of a whole • use fractions and percentages to describe and compare the m, for example when interpreting pie charts
------------------	--	---	---

5(Year 6)

<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Ratio and Proportion</p>	<ul style="list-style-type: none"> ■ 	<ul style="list-style-type: none"> ■ begin to use the notation a:b to record work ■ solve problems involving unequal quantities Eg. 'for every egg you need three spoonfuls of flour', '$\frac{3}{5}$ of the class are boys' to lay foundations for later formal approaches to ratio and proportion 	<ul style="list-style-type: none"> ■ 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 [Eg. measures, and 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 ■ recognise proportionality in contexts when the relations between quantities are in the same ratio (Eg. similar shapes and recipes) ■ link percentages or 360° to calculating angles of pie charts ■ consolidate understanding of ratio when comparing quantities, sizes and scale drawings by solving a variety of problems
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Algebra</p>	<ul style="list-style-type: none"> ■ 	<ul style="list-style-type: none"> ■ Begin to express missing number problems algebraically ■ find pairs of numbers that satisfy an equation with two unknowns ■ Begin use symbols and letters to represent variables and unknowns in mathematical situations that they already understand, such as: <ul style="list-style-type: none"> ➤ missing numbers, lengths, coordinates and angles ➤ formulae in mathematics and science ➤ equivalent expressions (Eg. $a + b = b + a$) ➤ generalisations of number patterns ■ 	<ul style="list-style-type: none"> ■ use simple formulae ■ generate and describe linear number sequences ■ enumerate possibilities of combinations of two variables ■ Consolidate using symbols and letters to represent variables and unknowns in mathematical situations that they already understand, such as: <ul style="list-style-type: none"> ➤ missing numbers, lengths, coordinates and angles ➤ formulae in mathematics and science ➤ equivalent expressions (Eg. $a + b = b + a$) ➤ generalisations of number patterns ■ number puzzles (Eg. what two numbers can add up to)

6(Year 6)

Measurements	<ul style="list-style-type: none"> ■ convert between different units of metric measure (Eg. Km and m; cm and m; cm and mm; g and kg; l and ml) using knowledge of place value and multiplication and division ■ understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints ■ measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres including using the relations of perimeter or area to find unknown lengths ■ calculate and compare the area of rectangles (including squares), and including using standard units, square centimetres (cm²) and square metres (m²) and estimate the area of irregular shapes ■ estimate volume [Eg. using 1 cm³ blocks to build cuboids, including cubes] and capacity [Eg. using water] ■ solve problems involving converting between units of time ■ use all four operations to solve problems involving measure [Eg. length, mass, volume, money] using decimal notation, including scaling ■ express missing measures questions algebraically, Eg. $4 + 2b = 20$ for a rectangle of sides 2 cm and b cm and perimeter of 20cm ■ calculate the area from scale drawings using given measurements use all four operations in problems involving time and money, including conversions (for example, days to weeks, expressing the answer as weeks and days) 	<ul style="list-style-type: none"> ■ 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 up to three decimal places ■ convert between miles and kilometres ■ 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 (cm³) and cubic metres (m³), and extending to other units [Eg. mm³ and km³] ■ connect conversion (Eg. from kilometres to miles) to a graphical representation as preparation for understanding linear/proportional graphs ■ know approximate conversions and are able to tell if an answer is sensible ■ use number lines to add and subtract positive and negative integers for measures such as temperature ■ relate the area of rectangles to parallelograms and triangles, Eg. by dissection, and calculate their areas, understanding and using the formulae (in words or symbols) to do this ■ become familiar with compound units for speed, such as miles per hour, and apply this knowledge in science or other subjects as appropriate 	<ul style="list-style-type: none"> ■ Convert between related metric units using decimals to three place (eg convert 1375mm to 1.375m, or vice versa) ■ Solve problems by measuring, estimating and calculating, measure and calculate using imperial units still in everyday use; ■ know their approximate metric values Calculate the area of right angled triangles given the lengths of the two perpendicular sides, ■ and the volume and surface area of cubes and cuboids
---------------------	--	--	--

7(Year 6)

Geometry properties of Shapes	<ul style="list-style-type: none"> ▪ identify 3-D shapes, including cubes and other cuboids, from 2-D representations ▪ know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles ▪ draw given angles, and measure them in degrees (°) ▪ 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° ▪ use the properties of rectangles to deduce related facts and find missing lengths and angles ▪ distinguish between regular and irregular polygons based on reasoning about equal sides and angles ▪ become accurate in drawing lines with a ruler to the nearest millimetre, and measuring with a protractor and use conventional markings for parallel lines and right angles ▪ use the term diagonal and make conjectures about the angles formed between sides, and between diagonals and parallel sides, and other properties of quadrilaterals, Eg. using dynamic geometry ICT tools <p>use angle sum facts and other properties to make deductions about missing angles and relate these to missing number problems</p>	<ul style="list-style-type: none"> ▪ draw 2-D shapes using given dimensions and angles ▪ recognise, describe and build simple 3-D shapes, including making nets ▪ compare and classify geometric shapes based on their properties and sizes and 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 ▪ recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles ▪ draw shapes and nets accurately, using measuring tools and conventional markings and labels for lines and angles ▪ describe the properties of shapes and explain how unknown angles and lengths can be derived from known measurements <p>Begin to express relationships algebraically Eg. $d = 2 \times r$ and $a = 180 - (b + c)$</p>	<ul style="list-style-type: none"> • Use correctly the vocabulary, notation and labeling conventions for lines, angles and shapes • Extend knowledge of properties of triangles and quadrilaterals and use these to visualise and solve problems, explaining reasoning with diagrams • Know the sum of angles on a straight line, in a triangle and at a point, and recognise vertically opposite angles • Identify all the symmetries of 2 D shapes; • transform images using ICT Construct a triangle given two sides and the included angle
--------------------------------------	---	--	---

8(Year 6)

<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Geometry Position and Direction</p>	<ul style="list-style-type: none"> ▪ 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 ▪ 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 and reflection should be in lines that are parallel to the axes 	<ul style="list-style-type: none"> ▪ describe positions on the full coordinate grid (all four quadrants) ▪ draw and label a pair of axes in all four quadrants with equal scaling. This extends their knowledge of one quadrant to all four quadrants, including the use of negative numbers ▪ draw and label rectangles (including squares), parallelograms and rhombuses, specified by coordinates in the four quadrants, predicting missing coordinates using the properties of shapes ▪ draw and translate simple shapes on the coordinate plane, and reflect them in the axes <p>begin to express translations algebraically Eg. 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</p>	<ul style="list-style-type: none"> • Use all four quadrants to find coordinates of points determined by geometric information
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Data Handling</p>	<ul style="list-style-type: none"> ▪ solve comparison, sum and difference problems using information presented in a line graph ▪ complete, read and interpret information in tables, including timetables ▪ connect work on coordinates and scales to interpretation of time graphs ▪ begin to decide which representations of data are most appropriate and why 	<ul style="list-style-type: none"> ▪ interpret and construct pie charts and line graphs and use these to solve problems ▪ calculate and interpret the mean as an average ▪ connect work on angles, fractions and percentages to the interpretation of pie charts ▪ encounter and draw graphs relating two variables, arising from own enquiry and in other subjects ▪ connect conversion from km to miles in measurement to its graphical representation <p>know when it is appropriate to find the mean of a data set</p>	<ul style="list-style-type: none"> • Understand and use the probability scale from 0 to 1; • find and justify probabilities based on equally likely outcomes in simple contexts • Explore hypotheses by planning surveys or experiments to collect small sets of discrete or continuous data; select, process, present and interpret the data, using ICT where appropriate; identify ways to extend the survey or experiment • Construct, interpret and compare graphs and diagrams that represent data, for example compare proportions in two pie charts that represent different totals. • Write a short report of a statistical enquiry and illustrate with appropriate diagrams, graphs and charts, using ICT as appropriate; justify the choice of what is presented • Answer a question by recording information in lists and tables;

9(Year 6)

			<ul style="list-style-type: none">• present outcomes using practical resources, pictures, block graphs or pictograms• Use diagrams to sort objects into groups according to a given criterion; suggest a different criterion for grouping the same objects
--	--	--	---

Key performance indicators are in **BOLD**.