

Year 6

Unit	What do I need to know before I start this unit? (Year 5)	What will I be learning this year?
<p>Number – Place Value</p> <p>Vocabulary: negative number, round to, interval, ascending, descending, decimal, decimal point, integer, million, sequence, equivalence, equivalent, decimal, one decimal place, two decimal places</p>	<p>Read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit</p> <ul style="list-style-type: none"> • Count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000 • Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero • Round any number up to 1000000 to the nearest 10, 100, 1000, 10 000 and 100 000 • 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. 	<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

NOTES:

- Pupils use the whole number system, including saying, reading and writing numbers accurately.

Unit	What do I need to know before I start this unit? (Year 5)	What will I be learning this year?
<p>Number – Addition, Subtraction, Multiplication and Division</p> <p>Vocabulary: Number bonds, number lines, add, more, plus, make, sum, total, altogether, number bonds, number lines, add, more, plus, make, sum, total, altogether, inverse, double, halve, equals, the same, difference between, subtract, take away, minus, less than >, decimal, whole, tenth, hundredth,</p>	<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. • 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 (nonprime) numbers • Establish whether a number up to 100 is prime and recall prime numbers up to 19 	<ul style="list-style-type: none"> • 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 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 • Perform mental calculations, including with mixed operations and large numbers <p>Identify common factors, common multiples and prime numbers</p> <p>Use their knowledge of the order of</p>

<p>thousandth, fraction, coins, notes, pounds, pence, change, cheaper, more expensive, estimate, over estimate, under estimate, million, sequence, equivalence, equivalent, decimal, one decimal place, two decimal places</p>	<ul style="list-style-type: none"> • 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 	<p>operations to carry out calculations involving the four operations</p> <ul style="list-style-type: none"> • Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why
	<p>NOTES:</p> <ul style="list-style-type: none"> • Practise addition, subtraction, multiplication and division for larger numbers, using the formal written methods of columnar addition and subtraction, short and long multiplication, and short and long division (see calculation policy). • 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. • Explore the order of operations using brackets; for example, $2 + 1 \times 3 = 5$ and $(2 + 1) \times 3 = 9$. Common factors can be related to finding equivalent fractions. 	

Unit	What do I need to know before I start this unit? (Year 5)	What will I be learning this year?
<p>Number – Fractions</p> <p>Vocabulary: Half, quarter, part, section, equal, equal parts, whole, unit fraction, non-unit fraction, integer, numerator, denominator, represent, share, group, mixed number, whole number, divide, set, multiple, tenth, interval, mixed number, improper fraction, simplify, hundredth</p>	<ul style="list-style-type: none"> • 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. • 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 • Read and write decimal numbers as fractions [for example, $0.71 = 71/100$] • 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 	<ul style="list-style-type: none"> • Use common factors to simplify fractions; 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 • Divide proper fractions by whole numbers • Associate a fraction with division and calculate decimal fraction equivalents • 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 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.

- **NOTES:**

- Practise, use and understand the addition and subtraction of fractions with different denominators by identifying equivalent fractions with the same denominator.
- Start with fractions where the denominator of one fraction is a multiple of the other (for example, $\frac{2}{1} + \frac{8}{1} = \frac{8}{5}$) and progress to varied and increasingly complex problems.
- Use a variety of images to support their understanding of multiplication with fractions. This follows earlier work about fractions as operators (fractions of), as numbers, and as equal parts of objects, for example as parts of a rectangle.
- Use understanding of the relationship between unit fractions and division to work backwards by multiplying a quantity that represents a unit fraction to find the whole quantity (for example, if $\frac{1}{4}$ of a length is 36cm, then the whole length is $36 \times 4 = 144\text{cm}$).
- Practise calculations with simple fractions and decimal fraction equivalents to aid fluency, including listing equivalent fractions to identify fractions with common denominators.
- Explore and make conjectures about converting a simple fraction to a decimal fraction (for example, $\frac{3}{8} = 0.375$). For simple fractions with recurring decimal equivalents, pupils learn about rounding the decimal to three decimal places, or other appropriate approximations depending on the context.
- Multiply and divide numbers with up to two decimal places by one-digit and two-digit whole numbers.

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| | <ul style="list-style-type: none">• Multiply decimals by whole numbers, starting with the simplest cases, such as $0.4 \times 2 = 0.8$, and in practical contexts, such as measures and money.• Introduce the division of decimal numbers by one-digit whole number, initially, in practical contexts involving measures and money. They recognise division calculations as the inverse of multiplication.• Develop 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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Unit	What do I need to know before I start this unit? (Year 4)	What will I be learning this year?
<p>Measurement</p> <p>Vocabulary: Estimate, measure, heavy, light, long, short, centimetres, metres, minutes, hours, seconds, clock, timer, length, width, height, perimeter, total sides, acute, obtuse, right angle, month, year, midnight, midday, am, pm, duration, estimate, consecutive, hour, minute, second, past to, end, start, digital, analogue, elapsed, length, width, rectilinear, area, volume, mass, capacity, potential, unit cube, kilo, milli, inch, foot, yard, imperial unit, pound (lb) ounce (oz) stone, gallon, pint</p>	<ul style="list-style-type: none"> • 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 • Measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres • 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 [for example, using 1 cm³ blocks to build cuboids (including cubes)] and capacity [for example, using water] • Solve problems involving converting between units of time • Use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling. 	<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 to up to three decimal places <p>Convert between miles and kilometres</p> <ul style="list-style-type: none"> • 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 [for example, mm³ and km³].

NOTES:

- Pupils connect conversion (for example, 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.
- Using the number line, add and subtract positive and negative integers for measures such as temperature.

Unit	What do I need to know before I start this unit? (Year 4)	What will I be learning this year?
<p>Geometry – Properties of Shape</p> <p>Vocabulary: group, sort, cube, cuboid, pyramid, sphere, cone, cylinder, circle, triangle, square, hexagon, pentagon, flat, curved, straight, face, side, edge, corner, 2D, 3D, length, width, side, vertex, vertices, edge, face, degree, interior angle, missing angle, square meter, square centimetre</p>	<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 (o) • Identify: <ul style="list-style-type: none"> ○ Angles at a point and one whole turn (total 360o) ○ Angles at a point on a straight line and 1/2 a turn (total 180o) ○ Other multiples of 90o • 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. 	<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.
<p>NOTES:</p> <ul style="list-style-type: none"> • 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. These relationships might be expressed algebraically for example, $d = 2 \times r$; $a = 180 - (b + c)$. 		

Unit	What do I need to know before I start this unit? (Year 5)	What will I be learning this year?
<p>Geometry – Position and Direction</p> <p>Vocabulary: rotate, rotation, degrees, right angle, ninety degree, one hundred and eighty degrees, clockwise, anticlockwise, reflect</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. 	<ul style="list-style-type: none"> 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
<p>NOTES:</p> <ul style="list-style-type: none"> 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. 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. 		

Unit	What do I need to know before I start this unit? (Year 5)	What will I be learning this year?
<p>Geometry – Statistics</p> <p>Vocabulary: count, tally, sort, graph, block, set, list, table, bar chart, pictogram, interpret, represent, interval</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. 	<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. <p>NOTES:</p> <ul style="list-style-type: none"> • Connect work on angles, fractions and percentages to the interpretation of pie charts. • Encounter and draw graphs relating two variables, arising from their own enquiry and in other subjects. They should connect conversion from kilometres to miles in measurement to its graphical representation. • Know when it is appropriate to find the mean of a data set.

Unit	What will I be learning this year?
<p data-bbox="136 140 320 212">Ratio and Proportion</p> <p data-bbox="129 252 327 288">Vocabulary:</p> <p data-bbox="129 292 327 448">Ratio, proportion, convert, scale, simplify, scale factor</p>	<ul data-bbox="421 140 2101 486" 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 [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. <p data-bbox="371 528 501 560">NOTES:</p> <ul data-bbox="371 608 2123 1023" style="list-style-type: none"> • Recognise proportionality in contexts when the relations between quantities are in the same ratio (for example, 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. They might use the notation a:b to record their work. • Solve problems involving unequal quantities, for example, ‘for every egg you need three spoonfuls of flour’, ‘5/3 of the class are boys’. These problems are the foundation for later formal approaches to ratio and proportion.

Unit	What will I be learning this year?
<p>Algebra</p> <p>Vocabulary: rule, expression, substitute, formula, equation</p>	<ul style="list-style-type: none"> • 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. <p>NOTES:</p> <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> ○ 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).