

National Curriculum 2014 ~ Statutory Programme of Study for Mathematics by Year Group

Strand: **Number and place value**

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<ul style="list-style-type: none"> • Count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number. • Count, read and write numbers to 100 in numerals; count in multiples of twos, fives and tens. • Given a number, identify one more and one less. • Identify and represent numbers using objects & pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least. • Read and write numbers from 1 to 20 in numerals and words. 	<ul style="list-style-type: none"> • Count in steps of 2, 3, and 5 from 0, and in tens from any number, forward or backward. • Recognise the place value of each digit in a two-digit number (tens, ones). • Identify, represent and estimate numbers using different representations, including the number line. • Compare and order numbers from 0 up to 100; use <, > and = signs. • Read and write numbers to at least 100 in numerals and in words. • Use place value and number facts to solve problems. 	<ul style="list-style-type: none"> • Count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number. • Recognise the place value of each digit in a three-digit number (hundreds, tens, ones). • Compare and order numbers up to 1000 . • Identify, represent and estimate numbers using different representations. • Read and write numbers up to 1000 in numerals and in words. • Solve number problems and practical problems involving these ideas. 	<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 (THTU, HTU, TU, and U). • Order and compare numbers beyond 1000. • Identify, represent and estimate numbers using different representations. • 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. 	<ul style="list-style-type: none"> • 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 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 1 000 000 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.

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Strand: Number - addition & subtraction

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<p>Addition & subtraction</p> <ul style="list-style-type: none"> • Pupils should be taught to: read, write & interpret mathematical statements involving addition (+), subtraction (-) & equals (=) signs • Represent and use number bonds and related subtraction facts within 20 • Add and subtract one-digit & two-digit numbers to 20, including zero. • Solve one-step problems that involve addition and subtraction, using concrete objects & pictorial representations, and missing number problems such as $7 = [] - 9$. 	<p>Addition & subtraction</p> <ul style="list-style-type: none"> • Solve problems with addition & subtraction: using concrete objects and pictorial representations, including those involving numbers, quantities and measures applying their increasing knowledge of mental and written methods. • Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100. • Add and subtract numbers using concrete objects, pictorial representations, and mentally, including: <ul style="list-style-type: none"> <i>a two-digit number and ones</i> <i>a two-digit number and tens</i> <i>two two-digit numbers</i> <i>adding three one-digit numbers</i> • Show that addition of two numbers can be done in any order and subtraction of one number from another cannot. • Recognise and use the inverse relationship between addition & subtraction and use this to check calculations and missing number problems. 	<p>Addition & subtraction</p> <ul style="list-style-type: none"> • Add and subtract numbers mentally, including: <ul style="list-style-type: none"> <i>a three-digit number and ones</i> <i>a three-digit number and tens</i> <i>a three-digit number and hundreds</i> • Add & subtract numbers with up to three digits, using formal written methods of columnar + and – • Estimate answers to calculations; use inverses to check • Solve problems, including missing number problems, using number facts, place value & more complex + & - . 	<p>Addition & subtraction</p> <ul style="list-style-type: none"> • Add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate. • Estimate and use inverse operations to check answers to a calculation. • Solve + and - two-step problems in contexts, deciding which operations and methods to use & why. 	<p>Addition & subtraction</p> <ul style="list-style-type: none"> • Add and subtract whole numbers with more than 4 digits, including using formal methods (columnar + & -) • Add and subtract numbers mentally with increasingly large numbers. • Use rounding to check answers 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 & why. 	<p>Addition, subtraction, multiplication & division</p> <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 whole 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. • Identify common factors, common multiples and prime numbers • Use their 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 addition, subtraction, multiplication and division • Use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy.

Strand: Number - multiplication & division

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<p>Multiplication & division</p> <ul style="list-style-type: none"> • Solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations 	<p>Multiplication & division</p> <ul style="list-style-type: none"> • Recall & use multiplication & division facts for 2, 5 & 10 tables, including recognising odd and even numbers • Calculate mathematical statements for multiplication and division within the multiplication tables; write them using multiplication (x), division (÷) & equals (=) signs. • Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot. • Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts. 	<p>Multiplication & division</p> <ul style="list-style-type: none"> • Recall & use \times and \div facts for the 3, 4 and 8 tables. • Write and calculate statements for \times and \div using tables they know, including for $TU \times U$ using mental and progressing to formal written methods. • Solve problems, including missing number problems, involving multiplication and division, including integer scaling problems and correspondence problems in which n objects are connected to m objects. 	<p>Multiplication & division</p> <ul style="list-style-type: none"> • Recall multiplication and division facts up to 12×12. • Use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers. • Recognise and use factor pairs and commutativity in mental calculations. • Multiply two-digit and three-digit numbers by a one-digit number using formal written layout. • Solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects. 	<p>Multiplication & division</p> <ul style="list-style-type: none"> • Identify multiples & factors; find all factor pairs of a number & common factors of 2 numbers. • Know & use the vocabulary of prime numbers, prime factors & composite numbers. • Establish whether a number up to 100 is prime; recall primes up to 19. • Multiply numbers up to 4 digits by a one or two-digit number using a formal 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; interpret remainders appropriately for the context • Multiply and divide whole numbers and those involving decimals by 10, 100 & 1000. • Recognise and use square numbers & cube numbers and notation for squared ², cubed ³ • Solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes • Solve problems involving $+$ - $\times \div$ and a combination of these, including understanding meaning of = sign • Solve problems involving \times and \div including scaling by simple fractions & problems involving simple rates. 	<p>ALGEBRA</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 number sentences involving two unknowns • Enumerate possibilities of combinations of two variables. <p>RATIO AND PROPORTION</p> <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 (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><i>For Fractions see below...</i></p>

Strand: Number - fractions

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<p>Fractions</p> <ul style="list-style-type: none"> • Recognise, find and name a half as one of two equal parts of an object, shape or quantity. • Recognise, find and name a quarter as one of four equal parts of an object, shape or quantity, 	<p>Fractions</p> <ul style="list-style-type: none"> • Recognise, find, name and write fractions $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$ & $\frac{3}{4}$ of a length, shape, set of objects or quantity • Write simple fractions e.g. $\frac{1}{2}$ of 6 = 3 and recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$ 	<p>Fractions</p> <ul style="list-style-type: none"> • Count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10. • Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators. • Recognise and use fractions as numbers: unit fractions & non-unit fractions with small denominators. • Recognise and show, using diagrams, equivalent fractions with small denominators. • Add and subtract fractions with the same denominator within one whole [e.g. $\frac{5}{7} + \frac{1}{7} = \frac{6}{7}$] • Compare and order unit fractions, and fractions with the same denominators. • Solve problems that involve all of the above. 	<p>Fractions</p> <ul style="list-style-type: none"> • Recognise and show using diagrams, families of common equivalent fractions • Count up and down in hundredths; recognise that hundredths arise when dividing an object by a hundred and dividing tenths by ten. • Solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number. • Add and subtract fractions with the same denominator • Recognise and write decimal equivalents of any number of tenths or hundredths. • Recognise & write decimal equivalents to $\frac{1}{4}$; $\frac{1}{2}$; $\frac{3}{4}$ • Find the effect of dividing a one or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths • Round decimals with one decimal place to the nearest whole number • Compare numbers with the same number of decimal places up to two decimal places • Solve simple measure and money problems involving fractions and decimals to two decimal places. 	<p>Fractions</p> <ul style="list-style-type: none"> • Compare & order fractions whose denominators are all multiples of the same number • Identify, name & write equivalent fractions of a given fraction, represented visually, inc. $\frac{1}{10}$ & $\frac{1}{100}$ • Recognise mixed numbers & improper fractions; convert from one form to the other; write mathematical statements > 1 as a mixed number [e.g. $\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1\frac{1}{5}$] • Add & subtract fractions with the same denominator & multiples of the same number. • Multiply proper fractions & mixed numbers by whole numbers, supported by materials & diagrams. • Read and write decimal numbers as fractions [e.g. $0.71 = \frac{71}{100}$] • Recognise and use $\frac{1}{1000}$ and relate them to $\frac{1}{10}$, $\frac{1}{100}$ & 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 with number to three decimal places. • Recognise the per cent symbol (%) and understand that per cent relates to 'the number of parts per 100' and write percentages as a fraction with denominator hundred; and as a decimal fraction <p>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.</p>	<p>Fractions</p> <ul style="list-style-type: none"> • Use common factors to simplify fractions; use common multiples to express fractions in the same denomination. • Compare & order 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 [for example $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$] • Divide proper fractions by whole numbers [for example $\frac{1}{3} \div 2 = \frac{1}{6}$] • Associate a fraction with division and calculate decimal fraction equivalents [for example 0.375] for a simple fraction [for example $\frac{3}{8}$] • Identify the value of each digit to three decimal places & \times and \div numbers by 10, 100 and 1000 - with answers to 3 decimal places • Multiply one-digit numbers with up to two decimal places by whole numbers • Use written \div methods where the answer has up to 2 decimal places • Solve problems which require answers to be rounded to specified degrees of accuracy • Recall & use equivalences between simple fractions, decimals & percentages, including in different contexts.

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Strand: Measurement

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<ul style="list-style-type: none"> • Compare, describe and solve practical problems for: <ul style="list-style-type: none"> - lengths and heights [e.g. long/short, longer/shorter, tall/short, double/half] - mass or weight [e.g. heavy/light, heavier than, lighter than] - capacity/volume [full/empty, more than, less than, half, half full, quarter] - time [e.g. quicker, slower, earlier, later] • Measure and begin to record the following: lengths and heights; mass/weight; capacity & volume; time (hours, minutes, seconds) • Recognise and know the value of different denominations of coins and notes. • Sequence events in chronological order using language such as: before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening. • Recognise and use language relating to dates, including days of the week, weeks, months and years. • Tell the time to the hour and half past the hour and draw the hands on a clock face to show these times. 	<ul style="list-style-type: none"> • Choose and use appropriate standard units to estimate and measure: <ul style="list-style-type: none"> - length/height in any direction (m/cm); - mass (kg/g); - temperature (°C); - capacity (litres/ml) to the nearest appropriate unit... <i>using rulers, scales, thermometers and measuring vessels</i> • Compare and order lengths, mass, volume / capacity and record the results using >, < and = • Recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value. • Find different combinations of coins that equal the same amounts of money • Solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change. • Compare and sequence intervals of time. • Tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clock face to show these times. • Know the number of minutes in an hour and the number of hours in a day. 	<ul style="list-style-type: none"> • Measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml) • Measure the perimeter of simple 2-D shapes • Add and subtract amounts of money to give change, using both £ and p in practical contexts • Tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks • Estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes, hours and o'clock; use vocabulary such as a.m./p.m., morning, afternoon, noon and midnight • Know the number of seconds in a minute and the number of days in each month, year and leap year • Compare durations of events, [for example to calculate the time taken by particular events or tasks.] 	<ul style="list-style-type: none"> • Convert between different units of measure (e.g. kilometre to metre; hour to minute) • Measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres. • Find the area of rectilinear shapes by counting squares. • Estimate, compare and calculate different measures, including money in pounds and pence. • Read, write and convert time between analogue and digital 12 and 24-hour clocks. • Solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days. 	<ul style="list-style-type: none"> • Convert between different units of metric measure [e.g. kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and milliliter] • 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) & square metres (m²) and estimate the area of irregular shapes • Estimate volume [eg. using 1 cm³ blocks to build cuboids including cubes] and capacity [e.g. 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 • 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 centimetre cubed (cm³) and cubic metres (m³), and extending to other units [for example mm³ and km³.]

National Curriculum 2014 ~ Statutory Programme of Study for Mathematics by Year Group

Strand: Geometry

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<p>Geometry: Properties of shapes</p> <ul style="list-style-type: none"> Recognise and name common 2-D and 3-D shapes, including: <ul style="list-style-type: none"> 2-D shapes (e.g. rectangles (including squares), circles and triangles) 3-D shapes (e.g. cuboids (including cubes), pyramids and spheres). <p>Position and direction</p> <ul style="list-style-type: none"> Describe position, directions and movements, including half, quarter and three-quarter turns. 	<p>Geometry: Properties of shapes</p> <ul style="list-style-type: none"> Identify & describe the properties of 2-D shapes, including the number of sides & line symmetry in a vertical line Identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces Identify 2-D shapes on the surface of 3-D shapes, [e.g. a circle on a cylinder & a triangle on a pyramid.] Compare and sort common 2-D and 3-D shapes and everyday objects. <p>Position and direction</p> <ul style="list-style-type: none"> Order and arrange combinations of mathematical objects in patterns and sequences. Use mathematical vocabulary to describe position, direction and movement including movement in a straight line, distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anti-clockwise) 	<p>Geometry: Properties of shapes</p> <ul style="list-style-type: none"> Draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them. Recognise that angles are a property of shape or a description of a turn Identify right angles, recognise that two right angles make a half-turn, three make three quarters of a turn and four a complete turn; identify whether angles are greater than or less than a right angle Identify horizontal and vertical lines and pairs of perpendicular and parallel lines. 	<p>Geometry: Properties of shapes</p> <ul style="list-style-type: none"> Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes Identify acute and obtuse angles and compare and order angles up to two right angles by size Identify lines of symmetry in 2-D shapes presented in different orientations Complete a simple symmetric figure with respect to a specific line of symmetry. <p>Position and direction</p> <ul style="list-style-type: none"> Describe positions on a 2-D grid as coordinates in the first quadrant Describe movements between positions as translations of a given unit to the left/right and up/down Plot specified points and draw sides to complete a given polygon. 	<p>Geometry: Properties of shapes</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 ($^{\circ}$) Identify: 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. <p>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. 	<p>Geometry: Properties of shapes</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. <p>Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons.</p> <ul style="list-style-type: none"> 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>Position and direction</p> <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.

National Curriculum 2014 ~ Statutory Programme of Study for Mathematics by Year Group

Strand: STATISTICS

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> • Interpret and construct simple pictograms, tally charts, block diagrams and simple tables • Ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity • Ask and answer questions about totaling and comparing categorical data. 	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> • Interpret and present data using bar charts, pictograms and tables • Solve one and two step questions [For example: <i>“How many more?”</i> and <i>“How many fewer?”</i>] ... using information presented in scaled bar charts and pictograms and tables. 	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> • Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs • Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs. 	<p>Pupils should be taught to:</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. 	<p>Pupils should be taught to:</p> <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.

For further detail see the associated “Notes and guidance (non-statutory)” pages in the Draft National Curriculum Framework document