

Year 4 Mathematics Objectives 2014-15

Programme of study	Non Statutory guidance	Objectives
<p>Number and place value Pupils should be taught to</p> <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 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. 	<p>Using a variety of representations, including measures, pupils 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.</p> <p>They begin to extend their knowledge of the number system to include the decimal numbers and fractions that they have met so far.</p> <p>They connect estimation and rounding numbers to the use of measuring instruments.</p> <p>Roman numerals should be put in their historical context so pupils 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.</p>	<p>Counting</p> <ul style="list-style-type: none"> • To count in multiples of 6,7,9,25 and 1000. • To find 1000 more or less than a given number. • To count backwards through zero to include negative numbers (Put negative numbers in context) • To count on or back in tens, hundreds and thousands <p>Comparing number</p> <ul style="list-style-type: none"> • To compare numbers up to 1000 • To compare decimal numbers (up to 2 decimal places) • To order numbers to a 1000 and beyond • To find and position numbers on a numberline. (blank and marked) <p>Identifying presenting and estimating numbers</p> <ul style="list-style-type: none"> • Use knowledge of place value to make estimates. • Represent visually numbers up to 1000. e.g abacus, place value cards, Diennes blocks. <p>Reading and writing numbers</p> <ul style="list-style-type: none"> • Read and order Roman Numerals to 100 . • To compare Roman Numerals with base 10. <p>Place value</p> <ul style="list-style-type: none"> • To recognise the value of each digit in a 4-digit number. • To partition numbers in different ways (for example, $231 = 200 + 30 + 1$) <p>Rounding</p> <ul style="list-style-type: none"> • Round numbers to the nearest 10, 100 or

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		<p>1000.</p> <ul style="list-style-type: none"> To estimate numbers, represent visually numbers up to 1000 and beyond. <p>Solving problems</p> <ul style="list-style-type: none"> To solve problems involving place value.
<p>Addition and subtraction Pupils should be taught to:</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 addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why. 	<p>Pupils continue to practise both mental methods and columnar addition and subtraction with increasingly large numbers to aid fluency (see Mathematics Appendix 1).</p>	<p>Mental calculation</p> <ul style="list-style-type: none"> To know addition and subtraction bonds to 1000 and beyond. To know addition and subtraction bonds with multiples of 10, 100 and 1000 To use known number bonds e.g $170 + 130 = 300$ to derive new facts e.g $1700 + 1200 = 5000$ Add or subtract the nearest multiple of 10, 100, or 1000 and adjust Partition numbers in to thousands, hundreds, tens and ones in order to add and subtract (expanded method) Subtract by counting up from the smaller to the larger number Add or subtract crossing the tens, hundreds and thousands boundary <p>Written methods</p> <ul style="list-style-type: none"> Column addition and subtraction formal written methods, including estimation and checking <p>Inverse operations, estimating and checking answers</p> <ul style="list-style-type: none"> To estimate answers and use inverse to check. <p>Solving problems</p> <ul style="list-style-type: none"> Choose and use appropriate number operations. Make and investigate general statements about familiar numbers.

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		<ul style="list-style-type: none"> • Use addition and subtraction to solve word problems, involving numbers, in real life including money. • Solve 2 step addition and subtraction problems linking to real life situations using appropriate methods throughout the curriculum
<p>Multiplication and division Pupils should be taught to:</p> <ul style="list-style-type: none"> • recall multiplication and division facts for multiplication tables 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>Pupils practise to become fluent in the formal written method of short multiplication and short division with exact answers (see Mathematics Appendix 1).</p> <p>Pupils write statements about the equality of expressions (for example, use the distributive law $39 \times 7 = 30 \times 7 + 9 \times 7$ and associative law $(2 \times 3) \times 4 = 2 \times (3 \times 4)$). They combine their knowledge of number facts and rules of arithmetic to solve mental and written calculations for example, $2 \times 6 \times 5 = 10 \times 6 = 60$.</p> <p>Pupils solve two-step problems in contexts, choosing the appropriate operation, working with increasingly harder numbers. This should include correspondence questions such as the numbers of choices of a meal on a menu, or three cakes shared equally between 10 children.</p>	<p>Multiplication and division facts</p> <ul style="list-style-type: none"> • Know multiplication facts by heart up to 12×12 and derive the corresponding division facts • To recognise multiples up to 12×12 • Use known facts to derive new facts. • To count in multiples of 6,7,9, 25 and 1000. <p>Mental calculation</p> <ul style="list-style-type: none"> • To use place value to multiply and divide. • Understand the effect of multiplying by 0 and 1 • Understand the effect of dividing by 1. • To multiply 3 numbers together. <p>Written calculations</p> <ul style="list-style-type: none"> • To use distributive and associative laws to solve mental and written calculations. • Develop and refine written methods for written multiplication and division. <p>Properties of numbers</p> <ul style="list-style-type: none"> • To recognise factor pairs. • To understand that multiplication is commutative. <p>Inverse operations, estimating and checking answers</p> <ul style="list-style-type: none"> • To use patterns in tables to solve problems and check answers. • Estimate answers and use inverse to

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		<p>check.</p> <p>Solving problems</p> <ul style="list-style-type: none"> • Choose and use appropriate number operations. • Make and investigate a general statement about familiar numbers by finding examples that satisfy it. • Solve 2 step multiplication and division problems linking to real life situations using appropriate methods throughout the Curriculum in real life, including money.
<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 one 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 and write decimal equivalents to $\frac{1}{4}$, $\frac{3}{4}$ <p>□ 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</p>	<p>Pupils should connect hundredths to tenths and place value and decimal measure. They extend the use of the number line to connect fractions, numbers and measures. Pupils understand the relation between non-unit fractions and multiplication and division of quantities, with particular emphasis on tenths and hundredths. Pupils make connections between fractions of a length, of a shape and as a representation of one whole or set of quantities. Pupils use factors and multiples to recognise equivalent fractions and simplify where appropriate (for example (for example, $\frac{6}{9} = \frac{2}{3}$ or $\frac{1}{4} = \frac{2}{8}$)).</p> <p>Pupils continue to practise adding and subtracting fractions with the same denominator, to become fluent through a variety of increasingly complex problems beyond one whole. Pupils are taught throughout that decimals and fractions are different ways of expressing numbers and proportions. Pupils' understanding of the number system and decimal place value is extended at this stage to</p>	<p>Counting in fractional amounts</p> <ul style="list-style-type: none"> • Count up and down in hundredths <p>Recognising fractions</p> <ul style="list-style-type: none"> • Understand that a hundredth is one whole divided into 100 equal parts. • Understand that a hundredth is one tenth divided by 10. <p>Comparing decimals</p> <ul style="list-style-type: none"> • Compare numbers with the same number of decimal places. • Use decimal notation, knowing what each digit in a decimal fraction represents. <p>Rounding</p> <ul style="list-style-type: none"> • Round decimals with one decimal place to the nearest whole number. <p>Equivalence</p> <ul style="list-style-type: none"> • Recognise equivalent fractions • Show using diagrams families of equivalent fractions. • Recognise and write decimal equivalents of any number of tenths or hundredths • Know decimal equivalents for a quarter, a half and three quarters.

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<ul style="list-style-type: none"> <input type="checkbox"/> round decimals with one decimal place to the nearest whole number <input type="checkbox"/> compare numbers with the same number of decimal places up to two decimal places <input type="checkbox"/> solve simple measure and money problems involving fractions and decimals to two decimal places. 	<p>tenths and then hundredths. This includes relating the decimal notation to division of whole number by 10 and later 100.</p> <p>They practise counting using simple fractions and decimals, both forwards and backwards.</p> <p>Pupils learn decimal notation and the language associated with it, including in the context of measurements. They make comparisons and order decimal amounts and quantities that are expressed to the same number of decimal places. They should be able to represent numbers with one or two decimal places in several ways, such as on number lines.</p>	<p>Adding and subtracting fractions</p> <ul style="list-style-type: none"> • To add and subtract fractions with the same denominator <p>Multiplication and division of decimals</p> <ul style="list-style-type: none"> • To identify the value of each digit in a one or two digit number divided by 10 or 100. <p><u>Solving problems</u></p> <ul style="list-style-type: none"> • Solve simple measure and money problems involving fractions and decimals to two decimal places.
<p>Measurement</p> <p>Convert between different units of measure [for example, kilometre to metre; hour to minute]</p> <ul style="list-style-type: none"> <input type="checkbox"/><input type="checkbox"/> measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres <input type="checkbox"/><input type="checkbox"/> find the area of rectilinear shapes by counting squares <input type="checkbox"/><input type="checkbox"/> estimate, compare and calculate different measures, including money in pounds and pence 	<p>Pupils build on their understanding of place value and decimal notation to record metric measures, including money.</p> <p>They use multiplication to convert from larger to smaller units.</p> <p>Perimeter can be expressed algebraically as $2(a + b)$ where a and b are the dimensions in the same unit.</p> <p>They relate area to arrays and multiplication.</p> <p>*Remember to include calendars and timetables</p>	<p>Comparing and estimating</p> <ul style="list-style-type: none"> • To compare and order length, mass, capacity, time(1.5 hrs, 1 ½ hrs) temperature and money using metric measures. • To estimate different measures and include rounding (money, mass, capacity, length, time, temperature) <p>Measuring and calculating</p> <ul style="list-style-type: none"> • To measure to the nearest appropriate unit, choosing suitable equipment. • To read and record measuring scales to the nearest division • To use decimal notation to record measures. • Calculate the perimeter and area of different shapes. • Develop efficiency in methods for calculating perimeter <p>Telling the time</p> <ul style="list-style-type: none"> • read, write and convert time between analogue and digital 12 and 24-hour

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		<p>clocks</p> <p>Converting</p> <ul style="list-style-type: none"> • solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days. • Convert between different units of measure (Km to m, hr to min) • solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days <p>Solving problems</p> <ul style="list-style-type: none"> • Use all 4 operations to solve real life practical problems, involving a range of measures and money.
<p>Geometry Pupils should be taught to:</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>Pupils continue to classify shapes using geometrical properties, extending to classifying different triangles (for example, isosceles, equilateral, scalene) and quadrilaterals (for example, parallelogram, rhombus, trapezium). Pupils compare and order angles in preparation for using a protractor and compare lengths and angles to decide if a polygon is regular or irregular. Pupils draw symmetric patterns using a variety of media to become familiar with different orientations of lines of symmetry; and recognise line symmetry in a variety of diagrams, including where the line of symmetry does not dissect the original shape.</p>	<p>Identifying shapes and their properties</p> <ul style="list-style-type: none"> • Identify lines of symmetry in 2D shapes in different orientations. <p>Drawing and constructing</p> <ul style="list-style-type: none"> • Complete a symmetrical figure (with respect to a specific line of symmetry) • Construct different polygons (by paper folding or on a pin board) • <p>Comparing and classifying</p> <ul style="list-style-type: none"> • To name 2d and 3d shapes (incl 4 types of triangles and quadrilaterals) • Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes <p>Angles</p> <ul style="list-style-type: none"> • identify acute and obtuse angles and compare and order angles up to two right angles by size . <p>Solving problems involving shapes</p>

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		<ul style="list-style-type: none"> To carry out investigations and justify reasoning, such as: <i>Investigating the different polygons that can be made using tangram pieces, the number of lines of reflective symmetry in a regular polygon is equal to the number of sides of a polygon, or how many different rectangles can you make with 12 squares)</i>
<p>Position and direction Pupils should be taught to:</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>Pupils draw a pair of axes in one quadrant, with equal scales and integer labels. They read, write and use pairs of coordinates, for example (2, 5), including using coordinate-plotting ICT tools.</p>	<p>Position, direction and movement</p> <ul style="list-style-type: none"> Describe and find the position in the first quadrant. To read, write and plot coordinates on the first quadrant, including the missing points of a polygon. To make patterns by repeatedly translating a shape. To translate shapes left and right (horizontally ,vertically, North, South, East and West) within a grid on the first quadrant, e.g: <i>sketch the position of a simple shape when it has been translated 2 units to the left.</i> <p>Solving problems</p> <ul style="list-style-type: none"> Use maps and treasure maps to follow journeys and ask questions, what if...? Battleships
<p>Statistics 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>	<p>Pupils understand and use a greater range of scales in their representations. Pupils begin to relate the graphical representation of data to recording change over time.</p>	<p>Interpreting, constructing and presenting data</p> <ul style="list-style-type: none"> Collecting data Organising information Representing in a range of formats Extracting information through questioning Interpreting data. <p>Discrete data: Use tally charts, pictograms, (where the symbol represents several units) bar</p>

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		charts,(Using different scales) bar line graphs and tables as well as sorting diagrams, e.g, Venn and Carroll diagrams Continuous data: line graphs and identify trends and patterns in results, as well as reading the scale.
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