

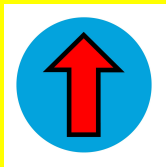


Maths Long Term Plan Hadrian Y6



Y6 Maths			
National Curriculum Objectives Year 6		Key Links	
<p>Pupils should be taught to:</p> <p>The principal focus of mathematics teaching in upper key stage 2 is to ensure that pupils extend their understanding of the number system and place value to include larger integers. This should develop the connections that pupils make between multiplication and division with fractions, decimals, percentages and ratio. At this stage, pupils should develop their ability to solve a wider range of problems, including increasingly complex properties of numbers and arithmetic, and problems demanding efficient written and mental methods of calculation. With this foundation in arithmetic, pupils are introduced to the language of algebra as a means for solving a variety of problems. Teaching in geometry and measures should consolidate and extend knowledge developed in number. Teaching should also ensure that pupils classify shapes with increasingly complex geometric properties and that they learn the vocabulary they need to describe them. By the end of year 6, pupils should be fluent in written methods for all four operations, including long multiplication and division, and in working with fractions, decimals and percentages. Pupils should read, spell and pronounce mathematical vocabulary correctly.</p>		<p>Year 6 – White Rose Maths Maths guidance year 6 (publishing.service.gov.uk) Mathematics programmes of study: key stages 1 and 2 (publishing.service.gov.uk) ActiveLearn: Home (activelearnprimary.co.uk)</p>	
Topics	N.C Objectives	Small Steps	Key Vocab

Autumn 1	Number: Number and Place Value	<p>Pupils should be taught to:</p> <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 	<ul style="list-style-type: none"> • Numbers to ten million • compare and order and number • round any number • negative numbers 	<p>ones (1s), tens (10s), hundreds (100s), thousands (1,000s), ten thousands (10,000s), hundred thousands (100,000s), millions (1,000,000s), ten million (10,000,000)</p> <p>place value partition/partitioned/partitioning interval estimate compare/comparison/comparing order/ordering less than (<), greater than (>), equal to (=) rounding/rounded/round up/round down/rounds negative, positive odd, even accurate/accurately, exactly, approximately</p>
Progression	<p>Year 5:</p> <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 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 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.

Teacher Subject Knowledge



[ActiveLearn: Planning \(activelearnprimary.co.uk\)](http://activelearnprimary.co.uk)

Cross Curricular Links



Science
Geography
Computing
History
DT
Music
PE

Autumn 1/2


Number: Addition, Subtraction, Multiplication and Division



Pupils should be taught to:


- 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

- Add and subtract integers
- multiply up to 4-digit number by 2-digit number
- short division
- division using factors
- long division
- common factors
- common multiples
- primes to 100
- squares and cubes
- order of operations
- mental calculations and estimation
- reason from known facts




add, subtract, sum, total, difference method, column, columnar multiply, multiplication, product, approximation divide, division, short division, long division factor, multiple, divisor, dividend,

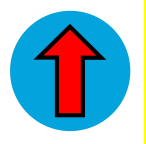

		<p>written method of short division where appropriate, interpreting remainders according to the context</p> <ul style="list-style-type: none"> • perform mental calculations, including with mixed operations and large number • identify common factors, common multiples and prime numbers • use their knowledge 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, an appropriate degree of accuracy. 		<p>remainder inverse grid method fraction, simplify, numerator, denominator</p>
<p>Progression</p> 	<p>Year 5:</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 • 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 			

	<ul style="list-style-type: none"> • 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 • 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 			
<p>Teacher Subject Knowledge</p> 	<p>ActiveLearn: Planning (activelearnprimary.co.uk)</p> <p>ActiveLearn: Planning (activelearnprimary.co.uk)</p>			
<p>Cross Curricular Links</p> 	<p>Science Geography Computing History DT</p>			
<p>Autumn 2</p>	<p>Number: Fractions</p>	<p>Pupils should be taught to</p> <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 	<ul style="list-style-type: none"> • simplify fractions • fractions on a number line • compare and order (denominator) • compare and order (numerator) • add and subtract fractions • add fractions • subtract fractions • mixed addition and subtraction • multiply fractions by integers • multiply fractions by fractions • divide fractions by integers 	<p>whole, part numerator, denominator, common denominator equivalent simplify, simplest form factor, highest common factor, lowest common multiple</p>

		<ul style="list-style-type: none"> multiply simple pairs of proper fractions, writing the answer in its simplest form [for example, $4 \frac{1}{2} \times 2 \frac{1}{4} = 8 \frac{1}{2}$] divide proper fractions by whole numbers [for example, $3 \frac{1}{2} \div 2 = 1 \frac{3}{4}$] associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example, $\frac{3}{8}$] recall and use equivalences between simple fractions, decimals and percentages, including in different contexts 	<ul style="list-style-type: none"> four rules with fractions fraction of an amount fraction of an amount - find the whole 	<p>compare order, ascending, descending less than, greater than proper fraction, improper fraction mixed number convert</p>
<p>Progression</p> 	<p>Year 5: (fractions)</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 [for example, $5 \frac{2}{4} + 5 \frac{4}{4} = 5 \frac{6}{4} = 1 \frac{5}{4}$] 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, $0.71 = \frac{71}{100}$] recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents 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 $2 \frac{1}{4}$, $4 \frac{1}{4}$, $5 \frac{1}{4}$, $5 \frac{2}{4}$, $5 \frac{4}{4}$ and those fractions with a denominator of a multiple of 10 or 25. 			
<p>Teacher Subject Knowledge</p>	<p>ActiveLearn: Planning (activelearnprimary.co.uk) ActiveLearn: Planning (activelearnprimary.co.uk)</p>			

		<p>that the diameter is twice the radius</p> <ul style="list-style-type: none"> recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles. 		<p>line, properties, value, reason negative, positive translation, reflection, original, left, down, up, right, mirror, away, diagonal</p> <p>degrees, measurement, length angle, obtuse, acute, reflex, right angle, interior protractor, baseline, crosshairs, scale vertex, edge, face parallel properties triangle, isosceles, equilateral, scalene regular, polygon, quadrilateral, parallelogram, kite, rhombus, trapezium diameter, radius, circumference, concentric, centre perimeter pyramid, tetrahedron, cylinder, prism, cuboid, cube</p>
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<p>Progression</p> 	<p>Year 5:</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. • 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: 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. 			
<p>Teacher Subject Knowledge</p> 	<p>Position and Direction - ActiveLearn: Planning (activelearnprimary.co.uk)</p> <p>Properties of Shape - ActiveLearn: Planning (activelearnprimary.co.uk)</p>			
<p>Cross Curricular Links</p> 	<p>Geography Science Computing PE DT Art</p>			
<p>Spring 1</p>	<p>Number: Decimals</p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • three decimal places • multiply by 10, 100 and 1,000 • divide by 10, 100 and 1,000 • multiply decimals by integers • divide decimals by integers • division to solve problems • decimals as fractions 	<p>multiply (×), divide (÷) decimal placeholder place value, tenths,</p>

		<ul style="list-style-type: none"> 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"> fractions to decimals 	<p>hundredths, thousandths</p> <p>factor, multiple, product group, share numerator, denominator</p> <p>convert, simplify, equivalent</p> <p>divisor, dividend, quotient, remainder</p>
<p>Progression</p> 	<p>Year 5:</p> <ul style="list-style-type: none"> 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 solve problems which require knowing percentage and decimal equivalents of 2 1/2, 4 1/5, 5 1/2, 5 4/5 and those fractions with a denominator of a multiple of 10 or 25. 			
<p>Teacher Subject Knowledge</p> 	<p>ActiveLearn: Planning (activelearnprimary.co.uk)</p>			
<p>Cross Curricular Links</p>	<p>DT Science Computing</p>			



Spring 1

Number: Percentages

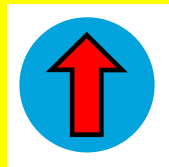
Pupils should be taught to:

- recall and use equivalences between simple fractions, decimals and percentages, including in different contexts

- fractions to percentages
- equivalent FDP
- order FDP
- percentage of an amount
- percentages - missing values



per cent (%),
percentage
parts, whole
decimal fraction,
equivalent
fraction, tenth,
hundredth, half,
quarter less than
(<), greater than
(>) divide (\div),
share, multiply (\times)
convert,
compare, order,
simplify

Progression




Year 5:

- 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 $2\frac{1}{4}$, $4\frac{1}{4}$, $5\frac{1}{4}$, $5\frac{2}{4}$, $5\frac{4}{4}$ and those fractions with a denominator of a multiple of 10 or 25.

<p>Teacher Subject Knowledge</p> 	<p>ActiveLearn: Planning (activelearnprimary.co.uk)</p>			
<p>Cross Curricular Links</p> 	<p>DT Science Geography</p>			
<p>Spring 1/2</p>	<p>Number: Algebra</p>	<p>Pupils should be taught to:</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. 	<ul style="list-style-type: none"> • find a rule - one step • find a rule - two step • forming expressions • substitution • formulae • forming equations • solve simple one-step equations • solve two-step equations • find pairs of values • enumerate possibilities 	<p>pattern, growing pattern sequence rule term algebra, algebraic expression formula, formulae substitute generalise operation calculation, calculate equation inverse solution represent value</p>
<p>Progression</p>	<p>Year 5: Topic starts in Year 6.</p>			

				
<p>Teacher Subject Knowledge</p> 	<p>ActiveLearn: Planning (activelearnprimary.co.uk)</p>			
<p>Cross Curricular Links</p> 	<p>Science</p>			
<p>Spring 1/2</p>	<p>Measurement: Converting Units</p>	<p>Pupils should be taught to:</p> <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 	<ul style="list-style-type: none"> • metric measures • convert metric measures • calculate with metric measures • miles and kilometres • imperial measures 	<p>units (of measure/ment), metric, imperial, length, mass, volume, capacity, distance measure, convert, equal, equivalent, approximate, smaller (unit), larger (unit), for every, ratio</p>

	<p>Measurement: Area, Perimeter and Volume</p>	<ul style="list-style-type: none"> • 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 [for example, mm³ and km³]. 	<ul style="list-style-type: none"> • Shapes - same area • area and perimeter • area of triangle • area of parallelogram • volume - counting cubes • volume of a cuboid 	<p>millimetres (mm), centimetres (cm), metres (m), kilometres (km), grams (g), kilograms (kg), millilitres (ml), litres (l) inches (in), feet (), ounces (oz), pounds (lbs), pints, miles, gallons, yards digits, decimal conversion table, conversion graph.</p> <p>perimeter, distance, area, space, volume centimetres (cm), metres (m), square centimetres (cm²), square metres (m²), cubic centimetres (cm³), cubic metres (m³) rectangle, square, triangle, rectilinear shape, sides, length, width, parallelogram, cube, cuboid measure, combine, total,</p>

				double, estimate.
<p>Progression</p> 	<p>Year 5:</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) • 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 • use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling. • 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 • 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. • estimate volume [for example, using 1 cm³ blocks to build cuboids (including cubes)] and capacity [for example, using water] 			
<p>Teacher Subject Knowledge</p> 	<p>Imperial and Metric Units - ActiveLearn: Planning (activelearnprimary.co.uk)</p> <p>Perimeter, Area and Volume - ActiveLearn: Planning (activelearnprimary.co.uk)</p>			
<p>Cross Curricular Links</p> 	<p>Science DT</p>			

<p>Spring 2</p>	<p>Number: Ratio</p>	<p>Pupils should be taught to:</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. 	<ul style="list-style-type: none"> • using ratio language • ratio and fractions • introducing the ratio symbol • calculating ratio • using scale factors • calculating scale factors • ratio and proportion problems 	<p>ratio, ratio notation, 1 : 2 proportion part, whole, total group fraction unequal, equal simplest form, simplify for every x there are y similar enlarge, enlargement scale, map scale, scale factor</p>
<p>Progression</p> 	<p>Year 5: Topic starts in Year 6.</p>			
<p>Teacher Subject Knowledge</p> 	<p>ActiveLearn: Planning (activelearnprimary.co.uk)</p>			

Cross Curricular
Links



DT
Computing
Science

Summer 1

Statistics

Pupils should be taught to:

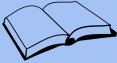
- interpret and construct pie charts and line graphs and use these to solve problems
- calculate and interpret the mean as an average.

- read and interpret line graphs
- draw line graphs
- use lines graphs to solve problems
- circles
- read and interpret pie charts
- pie charts with percentages
- draw pie charts
- the mean

average, mean, set, share pie chart, segment, whole, section, degree, angle, right angle tally chart, bar chart fraction, percentage line graph, axis/axes, estimate, accurate, interpret, increase, above, below, zero (0), value, x-axis, y-axis, minus (-), between, plot, point, vertical, horizontal, construct, convert/conversion, straight, equivalent, predict, curve more, equal, even, size, total, share, great(er/est),

				<p>calculate, divide, highest, compare, lowest, group, data, represent, balance, odd, di erent/di erence, least, inverse, operation, advantages, disadvantages, largest, half, scale, quarter, frequency, smallest, part, same, more, category, results, exact</p>
<p>Progression</p> 	<p>Year 5:</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>Teacher Subject Knowledge</p>	<p>ActiveLearn: Planning (activelearnprimary.co.uk)</p>			

	
<p>Cross Curricular Links</p> 	<p>Geography Science Computing</p>

<p>Key texts</p> 	<p>The Number Devil by Hans Magnus Enzensberger Sir Cumference and the Off-the-Charts Dessert by Cindy Neuschwander Multiplying Menace: The Revenge of Rumpelstiltskin by Pam Calvert</p> <p>RECOMMENDATIONS - MathsThroughStories.org - for specific topics</p>
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