Maths Long Term Plan Year 5

Year 5 Maths	
National Curriculum Objectives for Year 5	**Key Links**
Pupils should be taught: 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.	**https://resources.whiterosemaths.com/resources/year-5/** https://www.mathletics.com/uk/ **www.timestables.co.uk** **www.topmarks.co.uk** **(hit the button)** **Recap knowledge:** Continue times tables beyond x12 Place value time Continuous practice of written methods + - x ÷ Inverse operations Estimating & Rounding Multiples, factors, prime, squared, cubed Area and perimeter Fractions – all Shape

Topics		Working towards	Expected progress	Greater depth / extension	Key vocabulary
Autumn 1	Number: Place Value	•Read and write numbers up to 100 000 • Identify the value of each digit in a number up to 100 000 using place value grids and counters • Recognise concrete and visual representations of numbers with one decimal place • Order numbers up to 100 000 • Compare numbers up to 100 000 using the greater than and less than symbols	•Read and write most numbers up to 1 000 000 • Identify the value of most digits in numbers up to 1 000 000 • Use concrete, visual and abstract representations to help identify numbers with two decimal places • Order most numbers up to 1 000 000 • Compare most numbers up to 1 000 000 using the greater than and less than symbols • Round numbers up to 1 000 000 to the nearest 10, 100, 1000, 10 000 or 100 000 using a number line	•Read and write any number up to 1 000 000 • Identify the value of any digit in any number up to 1 000 000 • Identify the value of a digit in numbers with two decimal places • Order any set of numbers up to 1 000 000 • Compare a wide range of numbers using the greater than and less than symbols • Round numbers up to 1 000 000 to the nearest 10, 100, 1000, 10 000 or 100 000	Thousands, ten thousand, hundred, thousand, million, digit, Roman numeral, place value, represents, exchange >, greater than, <, less than, greatest, most, largest, least, fewest, smallest, more/less

		• Round numbers to the nearest 10, 100, 1000, 10 000 or 100 000 using a number line • Calculate intervals across zero using a number line • Compare and order negative numbers using a number line • Identify negative numbers in context • Recognise some powers of 10 within sequences • Read Roman numerals up to 500 (D) using a symbol chart • Identify years written in Roman numerals using a symbol chart	• Count backwards and forwards across zero using number lines • Compare and order negative numbers • Solve age appropriate problems involving negative numbers • Count forwards and backwards in steps of powers of 10 • Read Roman numerals up to 1000 (M) • Identify years written in Roman numerals • Solve reasoning problems using all of the above.	• Count backwards and forwards across zero using mental methods and number lines • Compare and order negative numbers • Solve a range of contextualised problems involving negative numbers • Count forwards and backwards in steps of powers of 10 from given numbers to 1 000 000 • Read Roman numerals up to 1000 (M) • Identify years written in Roman numerals • Solve a wide range of reasoning problems using all of the above.	compare, order, ascending, descending, between, half-way, estimate, approximate, round integer, positive, negative odd, even next, consecutive sequence, continue, predict pattern, pair, rule relationship sort, classify, property formula divisible (by), divisibility, factor square number
	Number: Addition and subtraction	•Add and subtract numbers with up to 5 digits using standard written methods • Round numbers to the nearest 10, 100, 1000 • Understand that addition is the inverse of subtraction • Round numbers using written jottings that support or help check answers to calculations • Choose whether to use mental or written methods of calculation with support • Solve one-step word problems	•Add and subtract numbers with at least 5 digits using mental and written methods; • round numbers to the nearest 10, 100, 1000, 10 000; • use inverse operations to check answers to addition and subtraction calculations; • mentally round numbers to check answers to calculations and determine, in the context of a problem, levels of accuracy; • choose a sensible way of calculating when solving a problem; • solve one-step and two-step word problems;	•Add and subtract any given number using mental and written methods; • round any number to a required degree of accuracy • mentally check answers to calculations using inverse; • efficiently and independently choose between mental and written calculations to enhance mathematical fluency and accuracy; • solve a wide range of multi-step word problems • mentally calculate with a range of large numbers using knowledge of rounding.	Plus, increase, sum total, altogether, score, double, near double, minus, decrease, leave, how many are left/left over? difference, between, half halve, how many more/fewer is… than…? is the same as, equals, tens boundary, hundreds boundary, inverse

		• Use modelled methods of mental calculation to increase speed and accuracy • Use modelled methods of mental calculation to practise adding numbers with up to 5 digits.	• independently choose appropriate methods for mental calculation; • practise mental calculation with increasingly large numbers.		units boundary, tenths boundary
	Number: Multiplication and division	•Recognise the multiples and factors of numbers and begin to find the common factors of two numbers • Identify the prime numbers less than 20 and find the prime numbers up to 100 using their multiplication tables knowledge • Multiply numbers up to four digits by one or two-digit numbers using short multiplication within their tables knowledge • Multiply and divide numbers mentally using known facts e.g. doubling and halving • Use the formal method of short division to divide numbers up to four digits by a one-digit number with increasing confidence • Begin to interpret remainders as whole numbers, decimals and simple fractions where appropriate • Multiply and divide whole numbers by 10, 100 and 1000 •Understand the notation for square and cube numbers	• Find factor pairs and identify the common factors of two or more numbers • Recall the prime numbers up to 20 and be able to find the prime numbers up to 100 using their multiplication tables knowledge • Multiply numbers up to four digits by one or two-digit numbers using short and long multiplication •Multiply and divide numbers mentally using known facts e.g. doubling, halving, partitioning and recombining and beginning to use known facts to multiply and divide decimals • Use the formal method of short division to divide numbers up to four digits by a one-digit number. • Interpret remainders as whole numbers, decimals and simple fractions and begin to choose the best way to express remainders, depending on the context of the problem • Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000 • Identify and use square numbers, cube numbers and powers • Recognise that the equals sign indicates equivalence and make equations balance	• Identify the common factors and prime factors of numbers • Recall the prime numbers up to 20 and find prime numbers up to and beyond 100 using their multiplication tables knowledge • Multiply numbers up to four digits by one or two digit numbers using short and long multiplication accurately and confidently • Interpret remainders as whole numbers, decimals and fractions. • Choose from these in order to express remainders appropriately depending on the context • Recognise and use square numbers, cube numbers and powers • Calculate square and cube roots through trial and improvement • Recognise that the equals sign indicates equivalence and make equations that balance using all four operations • Use and apply their mental and written multiplication and division methods to solve problems involving speed,	Lots of, groups of multiplication, multiply, multiplied by multiple of, repeated addition row, column, array, double, share equally divide, division, divided by, divided into, divisible by remainder, quotient inverse, dividend, divisor

		• Recognise that the equals sign indicates equivalence • Solve a range of multiplication and division problems including scaling and rates problems.	• Solve a wide range of multiplication and division problems, applying their mental and written methods including scaling, exchange rate and speed problems.	distance and time, scaling and exchange rate money problems.	
Progression 	**Year 4 expectations:** **Number: Place Value -** Count in multiples of 6, 7, 9, 25 and 1000; find 1000 more or less than a given number; count backwards through 0 to include negative numbers; know that ten hundreds are equivalent to one thousand, and that 1000 is ten times the size of 100, and use this to work out how many hundreds there are in other four-digit multiples of 100; recognise the place value of each digit in a four-digit number; compose and decompose four-digit numbers using standard and non-standard partitioning, writing the related addition calculation, and being able (with standard partitioning) to subtract any single place value part from the whole number; order and compare numbers beyond 1000; identify, represent and estimate numbers using different representations; reason about the location of any four-digit number, including identifying the previous and next multiple of 100 and 1000; round any number to the nearest 10, 100 or 1000; divide 1000 into 2, 4, 5 and 10 equal parts, and read scales/number lines marked in multiples of 1000 with 2, 4, 5 and 10 equal parts; solve number and practical problems that involve all of the above and with increasingly large positive numbers; read Roman numbers to 100 (I to C). **Number: Addition and Subtraction -** Add and subtract numbers with up to four digits using the formal written methods of column addition and subtraction; 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; continue to practise mental methods to aid fluency. **Number: Multiplication and Division -** Recall multiplication and division facts for multiplication tables up to 12 × 12 with increasing speed and accuracy; begin to calculate multiples of numbers beyond 12 × 12; use a range of mental calculation strategies for multiplication and division with increasing accuracy including multiplying by 0 and 1, dividing by 1, and multiplying together three numbers; use factor pairs and inverses when solving multiplication and division problems; use the expanded method and short method to multiply two-digit and three digit by one digit numbers; calculate using the short written method for division for two-digit and three digit by one-digit numbers, including those with remainders; use partitioning and rounding and adjusting to solve two-digit by one-digit number problems with increasing confidence; use multiplication and division facts to scale up and down; solve division problems involving fractions. **Year 6 expectations:** **Number: Place Value -** Read and write numbers up to 10 000 000; identify the value of each digit in a number up to 10 000 000; identify the value of a digit in numbers with three decimal places; order numbers up to 10 000 000; compare numbers by working out calculations; round numbers to a required degree of accuracy; calculate intervals across zero; solve problems involving negative numbers in context; solve reasoning problems using all of the above. **Number: Addition, Subtraction, Multiplication and Division -** • Practise mental calculations with increasingly large numbers using all four operations • perform mental calculations with mixed operations • perform two-step mental calculations with increasingly large numbers • add and subtract numbers, including decimals, using a formal written method • solve multi-step problems involving addition and subtraction • multiply numbers by a two-digit number using long multiplication • divide using a formal written method and use rounding depending on the context • divide four-digit numbers (with decimals) by a two-digit number using short division • solve two-step division problems, rounding the answer depending on the context				

	• round a number taking into account the context • solve two-step problems and check their answer using estimation • identify missing brackets within a calculation • sort one and two-step problems in a Venn diagram				
Cross curricular links / examples	**Not necessarily in this term…** **Link to real life situations** **Geography – population / climate** **Science – measuring differences etc / animal populations / facts linked to distance in space, size of planets etc** **History – timelines** **DT – measuring lengths / ingredients**				
<u>Autumn 2</u>	Measurement: Perimeter and Area	• Calculate the perimeter of composite rectilinear shapes in centimetres and metres, measurements of all sides given. • Use a given formula to calculate the perimeter of rectangles. • Find the area of rectangles, multiplying the length by the width, using times tables. • Estimate the area of irregular shapes by counting in whole and half squares.	• Calculate the perimeter of composite rectilinear shapes in centimetres and metres; calculating the length of any unknown sides. • Choose a formula to calculate the perimeter of rectangles. • Find the area of rectangles, multiplying the length by the width.	• Given the area and one measurement, calculate the length of an unknown side of a rectangle.	Perimeter, length, width, base, edge, closed, regular, rectilinear, regular, irregular, compound, approximate
	Statistics	• Interpret data presented in a line graph • Answer comparison, sum and difference questions about data presented in a line graph • Interpret information in tables • Answer questions about information presented in tables.	• Interpret data presented in a double line graph • Answer comparison, sum and difference questions about data presented in a double line graph • Interpret information in a range of tables • Answer questions about information presented in timetables, applying their knowledge of time.	• Interpret data presented in a straight-line graph • Answer comparison, sum and difference questions about data presented in a straight-line graph • Complete missing information in tables • Answer more complex questions about information presented in tables.	Interpret data, present data, read data, pictograms, bar charts, axis, scale tally, sort, vote survey, questionnaire, graph, block graph, tally chart table, frequency, Carroll diagram, Venn diagram label, title, most popular, most common least popular, least common, line graph, maximum/

					minimum value, anomaly
Progression 	**Year 4 expectations:** **Measurement: Length and perimeter + area -** Convert between: millimetres, centimetres. metres and kilometres (below 30 units); order mixed units of length measurement with decimal notation; solve length problems, calculating the difference (kilometres with one decimal place) between two distances – answers up to 120km; order a set of four mixed mass measurements which contain tenths or hundredths; measure the sides of rectangles and squares in centimetres and add the measurements together to calculate the perimeter with accuracy; use a formula to calculate the perimeters of squares and rectangles in centimetres and metres; calculate the area or rectangles and squares by recalling multiplication knowledge. **Statistics -** identify the difference between discrete and continuous data •interpret discrete and continuous data • present data as grouped bar charts • begin to interpret data in time graphs and line graphs • answer comparison, sum and difference questions about data presented in tables, pictograms, grouped bar charts and climate graphs • interpret and present data in a two-circle Venn diagram and a Carroll diagram. **Year 6 expectations:** **Measurement: Length and perimeter + area -** • Convert from larger to smaller metric units of length, *mass and volume*, up to three decimal places • convert from smaller to larger metric units of length, *mass and volume*, up to three decimal places • solve reasoning style problems involving conversion and calculation of metric units of length*, mass and volume* • find all possible rectangles and squares with a given area using mm2 • find all possible rectangles and squares with a given perimeter, using cm and mm • use a formula to calculate the area of triangles up to 200cm2 • use a formula to calculate the area of parallelograms up to 600cm2 • subdivide two composite rectilinear shapes to calculate area, some with unknown side measurements. **Statistics -** · Interprets and constructs pie charts and line graphs and uses these to solve problems · begins to connect work on angles, fractions and percentages to the interpretation of pie charts · recognises the difference between discrete and continuous data · recognises when information is presented in a misleading way, e.g. compares two pie charts where the sample sizes are different · when drawing conclusions, identifies further questions to ask - begins to decide which representation of data is most appropriate and why · calculates and interprets the mean as an average – with some understanding of when it is appropriate to find the mean median and mode of a data set				
Cross curricular links / examples	**Not necessarily in this term….** **Link to real life situations** **Science – gestation graphs** **Geography – graphs linked to weather** **Area and perimeter of cages for animals**				
<u>Spring 1</u>	*Continued Number: Multiplication and Division* Number: Fractions	• Compare and order fractions using a fraction wall to support them • Identify equivalent improper fractions and mixed numbers using diagrams to support • Add and subtract improper fractions with the same denominator	•Compare and order fractions using multiplication to find equivalent fractions • Identify equivalent improper fractions and mixed numbers • Convert between improper fractions and mixed numbers to add and subtract fractions with the same denominator • Add and subtract proper fractions with different denominators	•Compare and order fractions using multiplication and division to find equivalent fractions • Convert between improper fractions and mixed numbers • Convert between improper fractions and mixed numbers	Whole, part, equal parts, fraction, numerator, denominator, unit fraction, non-unit fraction, proper/ improper fraction mixed number equivalent, reduced to,

		• Add and subtract proper fractions with different denominators using resources to support them • Multiply proper fractions or mixed numbers by whole numbers using resources to support • Convert between decimal and fraction tenths and thousandths using resources to support them • Understand per cent and give percentage and decimal equivalents for half, quarters, fifths, tenths, twentieths, twenty-fifths, fiftieths and hundredths fractions	• Multiply proper fractions or mixed numbers by whole numbers by drawing diagrams • Use place value to convert between decimal and fraction tenths and thousandths • Give percentage and decimal equivalents for half, quarters, fifths and fractions with a denominator of a multiple of 10 or 25.	to add and subtract fractions with different denominators • Multiply proper fractions or mixed numbers by whole numbers	cancel one whole half, quarter, eighth, third, sixth, ninth, twelfth fifth, tenth.
Progression 	**Year 4 expectations:** **Number: Fractions -** •Find groups of equivalent fractions by multiplying •recognise hundredths and count in steps of multiple hundredths using a hundred square if needed •add and subtract fractions up to and over one whole using fraction bars •identify fraction and decimal equivalents for halves, quarters and tenths •solve a variety of problems involving fractions selecting support where needed. **Year 6 expectations:** **Number: Fractions -** • Compare and order fractions using the method of finding a common denominator • add and subtract fractions with unlike denominators using the method of finding a common denominator • multiply pairs of proper fractions using resources to support • divide a fraction by any whole number • use fraction, percentage and decimal equivalents to solve problems.				
Cross curricular links / examples	**Link to real life situations** **DT - Weighing ingredients** **PE – track activities**				
<u>Spring 2</u>	*Continued* Number: Fractions Number: Decimals and percentages	•Convert between decimal and fraction tenths and thousandths using resources to support them • Round a number with two decimal places to the nearest whole number and nearest	•Use place value to convert between decimal and fraction tenths and thousandths • Compare and order numbers with up to three decimal places when they have different numbers of decimal places	•Round a number with two decimal places to the nearest whole number and nearest tenth.	Tenth, twentieth, hundredth, thousandth, decimal, decimal point, decimal place, percentage, per cent, %, equivalent

		tenth using a number line to support • Compare and order numbers with up to three decimal places when they have the same number of decimal places • Understand per cent and give percentage and decimal equivalents for half, quarters, fifths, tenths, twentieths, twenty-fifths, fiftieths and hundredths fractions.	• Give percentage and decimal equivalents for half, quarters, fifths and fractions with a denominator of a multiple of 10 or 25		
Progression 	**Year 4 expectations:** **Number: Decimals -** •Recognise hundredths and count in steps of multiple hundredths using a hundred square if needed •identify fraction and decimal equivalents for halves, quarters and tenths •use place value grids to divide by 10 and 100 •draw number lines to round decimals to the nearest whole number •compare decimals with same number of decimal places •solve a variety of problems involving decimals and fractions selecting support where needed. **Year 6 expectations:** **Number: Decimals and percentages -** • Round a number with three decimal places to a specified degree of accuracy • use fraction, percentage and decimal equivalents to solve problems •use their multiplication and division knowledge to calculate, 10% and 1% and then using these as a basis to find percentages of an amount •recognising that 50% is equal to a half and therefore the whole about divided by 2 and 25% is equal to a quarter and therefore divided by 4				
Cross curricular links / examples	**Link to real life situations** **Weighing / measuring** **Science – measuring accurately – forces / time / weights**				
<u>Summer 1</u>	*Number: Decimals (continued)* Geometry: Properties of shape	• Identify regular and irregular 2D shapes • Identify the net of a cube or cuboid • Compare acute, obtuse and reflex angles • Know angles are measured in degrees • Find angles on a straight line and half a turn	• Reason about 2D shapes based on lengths and angles • Identify the nets of a range of 3D shapes • Estimate acute, obtuse and reflex angles • Measure angles using a protractor • Begin to draw angles using a protractor • Find angles at a point and one whole turn.	• Calculate missing angles or lengths of 2D shapes using known facts • Draw nets of 3D shapes • Accurately draw angles using a protractor • Calculate missing angles.	Polygon, closed, straight, 2D shape names: equilateral triangle, isosceles triangle, scalene triangle, right-angled triangle, symmetrical, line of symmetry, flat, line curved, , side, edge, end construct, centre, angle, right-

					angled vertex, vertices regular, irregular congruent 3D shape names, faces, sphere, hemi-sphere, spherical whole turn, half turn, quarter turn, rotate angle, right angle degree
Progression 	**Year 4 expectations:** **Geometry: Properties of shape -** • Compare and classify triangles and quadrilaterals based on their mathematical properties • identify, compare and order angles up to 180° using the vocabulary right-angled, acute and obtuse • complete a symmetrical image or pattern with a horizontal or vertical line of symmetry **Year 6 expectations:** • Draw 2D shapes to given dimensions of length and angle • draw their own net of a simple 3D shape including construction tabs • measure and calculate unknown angles in 2D shapes and around a point or on a straight line • label the parts of a circle including radius and diameter.				
Cross curricular links / examples	**Link to real life situations** **DT – structures** **Art**				
<u>Summer 2</u>	Geometry: Position and Direction	•Recognise reflective symmetry •Translate a shape knowing that it does not change shape.	• Draw a translated shape • Draw a reflected shape. • Begin to recognise and work with co-ordinates.	• Identify missing coordinates of a translated shape • Identify missing coordinates of a reflected shape.	Reflection, object, mirror line, image, reflect, x-axis, y-axis pattern, repeating pattern, translation ascend, descend grid, row, column origin, coordinates clockwise, anti-clockwise compass point, horizontal, vertical, diagonal, quadrant
	Measurement: converting units	• Convert between metric units of length, recording using decimal notion up to 2 decimal places • Convert between metric units of mass and volume, recording using decimal notion up to 3 decimal places	• Solve reasoning-style problems involving conversion of metric units of measurements. • Convert 12 hour times to 24 hour and 24 hour to 12 hour (5minute intervals). • Convert between minutes and seconds using measurements up to 1 decimal place.	• Solve more complex problems involving conversion of metric units of measures. • Convert 12 hour times to 24 hour and 24 hour to 12 hour (minute intervals).	unit, standard unit metric unit, imperial unit measuring scale, estimate approximately, perimeter kilometre (km), metre (m), centimetre (cm), millimetre (mm) mile, ruler, metre stick, kilogram (kg), half-

		• Solve simple problems involving conversion of metric units of measurements • Convert between metric and imperial units of length, mass, volume and capacity, using approximate conversions. • Convert 12-hour times to 24 hour and 24hour to 12 hour (15minute intervals). • Convert between minutes and seconds using whole number measurements. • Solve simple problems involving conversions of time units, including interpreting timetables. • Calculate the amount of days and weeks or just days from one date to another.	• Solve reasoning-style problems involving conversion of time units, including interpreting timetables.	• Solve more complex problems involving conversion of time units, including interpreting timetables.	kilogram, gram (g) litre (l), half-litre, millilitre (ml)pint area, covers, surface, leap year, century, millennium am, pm, noon, midnight 24-hour, 12-hour o'clock, half past, quarter to, quarter past clock, watch, hands digital/analogue clock/ watch, timer price, cost buy, bought, sell, sold spend, spent, change total, amount, value, discount, currency
	Measurement: Volume	• Convert between metric units of mass and volume, recording using decimal notion up to 3 decimal places. • Estimate capacity of containers • Estimate volume of cubes and cuboids.	• Apply knowledge to solve problems involving volume	• With confidence and accuracy, apply knowledge to solving reasoning and problem solving tasks.	Cubed, area, cross section, prism, cube, cuboid, face, length, height, width, depth, hidden
Progression 	**Year 4 expectations:** **Geometry: Position and Direction -** read and write a coordinate in the first quadrant; translate an object or shape horizontally then vertically on a 2D grid. **Measurement: converting units -** •Convert between: millimetres, centimetres. metres and kilometres (below 30 units) • order mixed units of length measurement with decimal notation •convert money amounts written in pence to decimal notation, e.g. 547p = £5.47 and vice versa (less than £15). •convert 12-hour times to 24-hour and 24-hour to 12- hour (5 minute intervals) •begin to solve simple problems involving conversion of digital and analogue times • solve time problems which involve conversion from hours and minutes to minutes and vice versa (times 5 minute intervals) **Year 6 expectations:**				

	Geometry: Position and Direction – • describe coordinate positions in all four quadrants • translate shapes on coordinate axes using coordinate translation • reflect and draw shapes on coordinate axes **Measurement: converting units –** • Convert from larger to smaller metric units of length, mass and volume, up to three decimal places • convert from smaller to larger metric units of length, mass and volume, up to three decimal places • convert units of time – whole, half, quarter and three-quarter units • solve reasoning style problems involving conversion and calculation of metric units of length, mass and volume • calculate the volume of a composite shape made up of two cuboids • find the measurement of an unknown dimension of a cuboid, given the surface area of one face and the volume.
Cross curricular links / examples	**Link to real life situations** **DT – food / nutrition / measuring** **Geography – map work**