Wistanstow Primary School

Mathematics Progression

Number – Number and Place Value

Autumn: 1 **Spring:** **Summer:**

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	• count in multiples of twos, fives and tens • count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number	• count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward	• count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number	• count in multiples of 6, 7, 9, 25 and 1000	• count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000	
				• count backwards through zero to include negative numbers	• interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero	• use negative numbers in context, and calculate intervals across zero
	• count, read and write numbers to 100 in numerals; • read and write numbers from 1 to 20 in numerals and words. • given a number, identify one more and one less	• recognise the place value of each digit in a two-digit number (tens, ones) • read and write numbers to at least 100 in numerals and in words	• recognise the place value of each digit in a three-digit number (hundreds, tens, ones) • read and write numbers up to 1000 in numerals and in words	• recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones) • find 1000 more or less than a given number	• Read and write numbers to at least 1 000 000 and determine the value of each digit	• read and write numbers up to 10 000 000 and determine the value of each digit
			• *Read Roman numerals to 12 (measures – time)*	• read Roman numerals to 100 (C) and know over time, the numeral system changed to include the concept of zero/place value.	• read Roman numerals to 1000 (M) and recognise years written in Roman numerals.	
	• use the language of: equal to, more than, less than (fewer), most, least	• compare and order numbers from 0 up to 100; use <, > and = signs	• compare and order numbers up to 1000	• order and compare numbers beyond 1000	• order and compare numbers to at least 1 000 000	• order and compare numbers up to 10 000 000
	• identify and represent numbers using objects and pictorial representations including the number line,	• identify, represent and estimate numbers using different representations, including the number line	• identify, represent and estimate numbers using different representations	• identify, represent and estimate numbers using different representations		
				• round any number to the nearest 10, 100 or 1000	• round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000	• round any whole number to a required degree of accuracy

	•	• use place value and number facts to solve problems.	• solve number problems and practical problems involving these ideas.	• solve number and practical problems that involve all of the above and with increasingly large positive numbers	• solve number problems and practical problems that involve all of the above	• solve number and practical problems that involve all of the above *(read, write, order and compare)*

Number – Addition and Subtraction

Autumn: **Spring:** **Summer:**

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	• represent and use number bonds and related subtraction facts within 20	• Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100 • Show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot	• add and subtract numbers mentally, including: a three-digit number and ones a three-digit number and tens a three-digit number and hundreds		• add and subtract numbers mentally with increasingly large numbers	• perform mental calculations, including with mixed operations and large numbers
	• add and subtract one-digit and two-digit numbers to 20, including zero	• Add and subtract numbers using concrete objects, pictorial representations, and mentally, including: ○ A two-digit number and ones ○ A two-digit number and tens ○ Two two-digit numbers ○ Adding three one-digit numbers	• add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction	• Add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate	• add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)	• use their knowledge of the order of operations to carry out calculations involving the four operations
	• read, write and interpret mathematical statements involving addition (+), subtraction (–) and equals (=) signs	• Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.	• estimate the answer to a calculation and use inverse operations to check answers	• Estimate and use inverse operations to check answers to a calculation	• use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy	

	• solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = ? – 9.	• Solve problems with addition and subtraction: ○ Applying their increasing knowledge of mental and written methods ○ Using concrete objects and pictorial representations, including those involving numbers, quantities and measures	• solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction.	• Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why.	• solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.	• solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why

Number – Multiplication and Division

Autumn: **Spring:** **Summer:**

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
		• Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers	• recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables	• Recall multiplication and division facts for multiplication tables up to 12 × 12	• multiply and divide numbers mentally drawing upon known facts	• perform mental calculations, including with mixed operations and large numbers
		• Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs	• write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods	• Multiply two-digit and three-digit numbers by a one-digit number using formal written layout	• 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 • 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 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 ○ short division • and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context
		• Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot		• Recognise and use factor pairs and commutativity in mental calculations • 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	• multiply and divide whole numbers and those involving decimals by 10, 100 and 1000 • identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers	• use their knowledge of the order of operations to carry out calculations involving the four operations

	• solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher.	• Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts.	• solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects.	• 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.	• know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers • establish whether a number up to 100 is prime and recall prime numbers up to 19	• identify common factors, common multiples and prime numbers

Number – Fractions (Decimals and Percentages) **Autumn:** **Spring:** **Summer:**

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	• 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.	• Recognise, find, name and write fractions: 1/3, 1/4, 2/4 and 3/4 of a length, shape, set of objects or quantity	• 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 and non-unit fractions with small denominators • recognise and show, using diagrams, equivalent fractions with small denominators	• Recognise and show, using diagrams, families of common equivalent fractions • Recognise and write decimal equivalents of any number of tenths or hundredths • Recognise and write decimal equivalents 1/4, 1/2, 3/4.	• identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths • read and write decimal numbers as fractions [for example, 0.71 = 71/100 • recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents • 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 • 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, 2/5 + 4/5 = 6/5 = 1 1/5	• use common factors to simplify fractions; use common multiples to express fractions in the same denomination • associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example, 3/8] • recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.
		• Write simple fractions for example, 1/2 of 6 = 3 and recognise the equivalence of 2/4 and 1/2	• compare and order unit fractions, and fractions with the same denominators	• Compare numbers with the same number of decimal places up to two decimal places	• compare and order fractions whose denominators are all multiples of the same number • read, write, order and compare numbers with up to three decimal places	• compare and order fractions, including fractions > 1

			• add and subtract fractions with the same denominator within one whole [for example, 5/7 + 1/7 = 6/7	• Add and subtract fractions with the same denominator	• add and subtract fractions with the same denominator and denominators that are multiples of the same number	• add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions
			• 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	• Count up and down in hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten.		
				• Round decimals with one decimal place to the nearest whole number	• round decimals with two decimal places to the nearest whole number and to one decimal place	
				• 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	• multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams	• multiply simple pairs of proper fractions, writing the answer in its simplest form [for example, 1/4 x 1/2 = 1/8] • divide proper fractions by whole numbers [for example, 1/3 ÷ 2 = 1/6
			• solve problems that involve all of the above.	• 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 • Solve simple measure and money problems involving fractions and decimals to two decimal places.	• solve problems involving number up to three decimal places solve problems which require knowing percentage and decimal equivalents of 1/2, 1/4, 1/5, 2/5, 4/5 and those fractions with a denominator of a multiple of 10 or 25.	• solve problems which require answers to be rounded to specified degrees of accuracy

						• 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 • 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

Measurement

Autumn: **Spring:** **Summer:**

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6

	• compare, describe and solve practical problems for:
	  ○ lengths and heights [for example, long/short, longer/shorter, tall/short, double/half]
	  ○ mass/weight [for example, heavy/light, heavier than, lighter than]
	  ○ capacity and volume [for example, full/empty, more than, less than, half, half full, quarter]
	  ○ time [for example, quicker, slower, earlier, later]
	• measure and begin to record the following:
	  ○ lengths and heights
	  ○ mass/weight
	  ○ capacity and volume
		• Choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (kg/g); temperature (°C); capacity (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels
		• Compare and order lengths, mass, volume/capacity and record the results using >, < and =
			• measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml)	• Convert between different units of measure [for example, kilometre to metre; hour to minute]	• 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
						• 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 and know the value of different denominations of coins and notes	• 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	• add and subtract amounts of money to give change, using both £ and p in practical contexts	• Estimate, compare and calculate different measures, including money in pounds and pence		

	• Measure and begin to record:time (hours, minutes, seconds) • sequence events in chronological order using language [for example, 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	• Compare and sequence intervals of time Know the number of minutes in an hour and the number of hours in a day.	• 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]		• solve problems involving converting between units of time	
	• tell the time to the hour and half past the hour and draw the hands on a clock face to show these times.	• 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	• 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 and hours; use vocabulary such as o'clock, a.m./p.m., morning, afternoon, noon and midnight			
			• measure the perimeter of simple 2-D shapes	• Measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres • Find the area of rectilinear shapes by counting squares	• 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	• 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
					• estimate volume [for example, using 1 cm3 blocks to build cuboids	• calculate, estimate and compare volume of cubes and cuboids using

					(including cubes)] and capacity [for example, using water]	standard units, including cubic centimetres (cm3) and cubic metres (m3), and extending to other units [for example, mm3 and km3].
					• use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling.	• solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate

Geometry – Properties of Shapes

Autumn: **Spring:** **Summer:**

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	• recognise and name common 2-D and 3-D shapes, including: ○ 2-D shapes [for example, rectangles (including squares), circles and triangles]	• Identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line • Identify 2-D shapes on the surface of 3-D shapes, [for example, a circle on a cylinder and a triangle on a pyramid] • Compare and sort common 2-D and 3-D shapes and everyday objects.	• draw 2-D shapes • identify horizontal and vertical lines and pairs of perpendicular and parallel lines.	• Compare and classify geometric shapes, including quadrilaterals and triangles**,** based on their properties and sizes • 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.	• distinguish between regular and irregular polygons based on reasoning about equal sides and angles.	• draw 2-D shapes using given dimensions and angles • compare and classify geometric shapes based on their properties and sizes • illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius
	○ 3-D shapes [for example, cuboids (including cubes), pyramids and spheres].	• Identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces	• and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them		• identify 3-D shapes, including cubes and other cuboids, from 2-D representations	• recognise, describe and build simple 3-D shapes, including making nets

			• recognise angles as 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 acute and obtuse angles and compare and order angles up to two right angles by size	○ 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 and1/2 a turn (total 180º) ○ other multiples of 90 º • use the properties of rectangles to deduce related facts and find missing lengths and angles	• find unknown angles in any triangles, quadrilaterals, and regular polygons • recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles.

Geometry – Position and Direction

Autumn: **Spring:** **Summer:**

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	• describe position, direction and movement, including whole, half, quarter and three-quarter turns.	• Use mathematical vocabulary to describe position, direction and movement, including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anti-clockwise).		• Describe positions on a 2-D grid as coordinates in the first quadrant • Plot specified points and draw sides to complete a given polygon.		• describe positions on the full coordinate grid (all four quadrants)
		• Order and arrange combinations of mathematical objects in patterns and sequences		• Describe movements between positions as translations of a given unit to the left/right and up/down	• 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.	• draw and translate simple shapes on the coordinate plane, and reflect them in the axes.

Statistics

Autumn: **Spring:** **Summer:**

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
		• Interpret and construct simple pictograms, tally charts, block diagrams and simple tables	• Interpret and present data using bar charts, pictograms and tables	• Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs.	• complete, read and interpret information in tables, including timetables.	• interpret and construct pie charts and line graphs and use these to solve problems
		• Ask and answer questions about totalling and comparing categorical data. • Ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity	• Solve one-step and two-step questions [for example, 'How many more?' and 'How many fewer?'] using information presented in scaled bar charts and pictograms and tables.	• Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs.	• solve comparison, sum and difference problems using information presented in a line graph	• calculate and interpret the mean as an average.

Ratio and Proportion

Autumn: **Spring:** **Summer:**

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
						• 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.

Algebra

Autumn: **Spring:** **Summer:**

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
						• 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.