Westfield Primary School

Progression of Knowledge and Skills for Maths

	EYFS	KS1		KS2			
		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6

KNOWLEDGE and SKILLS

	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Number and Place Value	Numerical Patterns: Compare quantities up to 10 in different contexts. Explore and represent patterns within numbers up to 10. Numerical Patterns: Explore and represent patterns within numbers up to 10. Number: Have a deep understanding of numbers up to 10. Numerical Patterns:	Count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number. Count, read and write numbers to 100 in numerals: count in 2s, 5s and 10s. Given a number, identify 1 more and 1 less. Identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more	Count in steps of 2,3,5 and 0, and in 10s from any number, forward and backward. Recognise the place value of each digit in a 2-digit number. Identify, represent and estimate numbers using different representations, including the number line. Compare and order numbers from 0 up to 100 using < , > and = signs. Read and write numbers to at	Count from 0 in multiples of 4,8,50 and 100. Find 10 or 100 more or less than a given number. Recognise the place value of each digit in a 3-digit number. Compare and order numbers up to 1,000. Identify, represent and estimate numbers using different representations. Read and write numbers up to 1000 in numerals and in words.	Count in multiples of 6, 7, 9, 25 and 1,000 Find 1,000 more or less than a given number Count backwards through 0 to include negative numbers Recognise the place value of each digit in a four-digit number (1,000s, 100s, 10s, and 1s) Order and compare numbers beyond 1,000	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 0	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 0 Solve number and practical problems that involve all of the above

	Compare quantities up to 10 in different contexts. Numerical Patterns: Explore and represent patterns within numbers up to 10. Number: Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 Comparing quantities of identical or non-identical objects. Counting to 20.	than, less than, most, least. Read and write numbers from 1-20 in numerals and words.	least 100 in numerals and in words. Use place value and number facts to solve problems.	Solve number problems and practical problems involving these ideas.	Identify, represent and estimate numbers using different representations Round any number to the nearest 10, 100 or 1,000 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 0 and place value	Round any number up to 1,000,000 to the nearest 10, 100, 1,000, 10,000 and 100,000 Solve number problems and practical problems that involve all of the above Read Roman numerals to 1,000 (M) and recognise years written in Roman numerals	

Number: Addition and subtraction	Sorting into groups.	Read, write and interpret mathematical statements involving addition, subtraction and equals signs.	Solve problems with addition and subtraction.	Add and subtract numbers mentall including:	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)	Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication
	One more of one less within 5.			-A 3-digit number and 1s			
			Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100.	-A 3-digit number and 10s.			
	Combining 2 groups to make the whole.			-A 3-digit number and 100s.			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
	Number bonds to 10 using a tens frame.	Represent and use number bonds and related subtraction facts within 20.	Add and subtract numbers using concrete objects, pictorial representations and mentally, including:	Add and subtract numbers with up to 3-digits , using formal written methods of columnar addition and subtraction.	Estimate and use inverse operations to check answers to a calculation	Add and subtract numbers mentally with increasingly large numbers	
	Number bonds to 10 using a part-whole model.						
	Adding by counting on.	Add and subtract 1 digit and 2 digit numbers to 20, including 0.	2-digit number and 1s 2-digit number and 10s two 2-digit numbers adding three 1-digit numbers.	Estimate the answer to a calculation and use inverse operations to check answers.	Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why	Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy	
	Taking away by counting back.						
		Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problem such as 7= ?-9	Show that addition of 2 numbers can be done in any order and subtraction of 1 number from	Solve problems, including missing number problems, using number facts, place value and		Solve addition and subtraction multi-step problems in contexts, deciding which	Divide numbers up to 4 digits by a two-digit number using the formal written method of short division

			another cannot. Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.	more complex addition and subtraction.		operations and methods to use and why	where appropriate, interpreting remainders according to the context Perform mental calculations, including with mixed operations and large numbers Identify common factors, common multiples and prime numbers Use their knowledge of the order of operations to carry out calculations involving the 4 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 |
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| Number: Multiplication or Division | Doubling. Halving and sharing. Odds and evens. | 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. | Recall and use multiplication and division facts for the 2,5 and 10 multiplication tables, including recognising odd and even numbers. Calculate mathematical statements for multiplication and division within the multiplication, division and equals signs. Show that multiplication of 2 numbers can be done in any order and division of 1 number by another cannot. Solve problems involving multiplication and division, | Recall and use multiplication and division facts for the 3,4 and 8 multiplications tables. Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for 2-digit numbers times 1-digit numbers, using mental and progressing to formal written methods. Solve problems, including missing number problems, involving multiplication and division, including positive | 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 3 numbers Recognise and use factor pairs and commutativity in mental calculations Multiply two-digit and three-digit numbers by a one-digit number | Identify multiples and factors, including finding all factor pairs of a number, and common factors of 2 numbers 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 Multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit | 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 written method of short division |

| | | | using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts. | integer scaling problems and correspondence problems in which n objects are connected to m objects. | using formal written layout

Solve problems involving multiplying and adding, including using the distributive law to multiply two-digit numbers by 1 digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects | numbers

Multiply and divide numbers mentally, drawing upon known facts

Divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context

Multiply and divide whole numbers and those involving decimals by 10, 100 and 1,000

Recognise and use square numbers and cube numbers, and the notation | where appropriate, interpreting remainders according to the context

Perform mental calculations, including with mixed operations and large numbers

Identify common factors, common multiples and prime numbers

Use their knowledge of the order of operations to carry out calculations involving the 4 operations

Solve addition and subtraction |
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| | | | | | 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, | 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 |
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					including scaling by simple fractions and problems involving simple rates	
Number: Fractions		Recognise, find and name a half as 1 of 2 equal parts of an object, shape or quantity. Recognise, find and name a quarter as 1 of 4 equal parts of an object, shape or quantity.	Recognise, find, name and write fractions ⅓,¼,2/4,¾ of a length, shape set of objects or quantity. Write simple fractions, for example ½ of 6 =3 and recognise the equivalence of 2/4 and ½.	Count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10 Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators Recognise and use fractions as numbers: unit fractions and		

| | | | | non-unit fractions with small denominators

Recognise and show, using diagrams, equivalent fractions with small denominators

Add and subtract fractions with the same denominator within one whole [for example, + =]

Compare and order unit fractions, and fractions with the same denominators

Solve problems that involve all of the above | | | |
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Fractions including Decimals and Percentages					Recognise and show, using diagrams, families of common equivalent fractions	Compare and order fractions whose denominators are all multiples of the same number	Use common factors to simplify fractions; use common multiples to express fractions in the same denomination
						Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths	Compare and order fractions, including fractions >1
					Count up and down in hundredths; recognise that hundredths arise when dividing an object by 100 and dividing tenths by 10		Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions
					Solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole	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, + = = 1]	Multiply simple pairs of proper fractions, writing the answer in its simplest form [for example, × =]
						Add and subtract	

					number	fractions with the same denominator, and denominators that are multiples of the same number
					Add and subtract fractions with the same denominator	
					Recognise and write decimal equivalents of any number of tenths or hundreds	Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams
					Recognise and write decimal equivalents to , ,	
					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	Read and write decimal numbers as fractions [for example, 0.71 =]
						Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents
					Round decimals with 1 decimal place to the	Round decimals

Additional column (rightmost):

Divide proper fractions by whole numbers [for example, ÷ 2 =]

Associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example,]

Identify the value of each digit in numbers given to 3 decimal places and multiply and divide numbers by 10, 100 and 1,000 giving answers up to 3 decimal places

Multiply one-digit numbers with up

					nearest whole number	with 2 decimal places to the nearest whole number and to 1 decimal place	to 2 decimal places by whole numbers
					Compare numbers with the same number of decimal places up to 2 decimal places	Read, write, order and compare numbers with up to 3 decimal places	Use written division methods in cases where the answer has up to 2 decimal places
					Solve simple measure and money problems involving fractions and decimals to 2 decimal places	Solve problems involving number up to 3 decimal places	Solve problems which require answers to be rounded to specified degrees of accuracy
						Recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per 100', and write percentages as a fraction with denominator 100, and as a decimal	Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts

						fraction Solve problems which require knowing percentage and decimal equivalents of , , , , and those fractions with a denominator of a multiple of 10 or 25	
Measurement	Time-their day in school. Understand what length, height and distance are. Learning what weight is. Learning what capacity is.	Compare, describe and solve practical problems for -lengths and heights -Mass/weight -Capacity and volume -Time Measure and begin to record the following -Lengths and heights -Mass/weight	Choose and use appropriate standard units to estimate and measure length/height in any direction, mass, temperature, capacity to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels. Compare and	Measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml) Measure the perimeter of simple 2-D shapes Add and subtract amounts of	Convert between different units of measure [for example, kilometre to metre; hour to minute] Measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres	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	Solve problems involving the calculation and conversion of units of measure, using decimal notation up to 3 decimal places where appropriate Use, read, write and convert between standard units, converting measurements of

| | | -Capacity and volume
-Time

Recognise and know the value of different denominations of coins and notes.

Sequence events in chronological order using language.

Recognise and use language relating to dates, including days of the week, weeks, months and years.

Tell the time to the hour and half past the hour and draw the hands on a clock face to show these times. | order lengths, mass, volume/capacity and record the results using <, > and =

Recognise and use symbols for pounds and pence, combine amounts to make a particular value.

Find different combinations of coins that equal the same amounts of money.

Solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change.

Compare and sequence intervals of time. | money to give change, using both £ and p in practical contexts

Tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks

Estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes and hours; use vocabulary such as o'clock, am/pm, morning, afternoon, noon and midnight | Find the area of rectilinear shapes by counting squares

Estimate, compare and calculate different measures, including money in pounds and pence

Read, write and convert time between analogue and digital 12- and 24-hour clocks

Solve problems involving converting from hours to minutes, minutes to seconds, years to months, weeks to days | units and common imperial units such as inches, pounds and pints

Measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres

Calculate and compare the area of rectangles (including squares), including using standard units, square centimetres (cm²) and square metres (m²), and estimate the area of irregular shapes

Estimate volume | length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to 3 decimal places

Convert between miles and kilometres

Recognise that shapes with the same areas can have different perimeters and vice versa

Recognise when it is possible to use formulae for area and volume of shapes

Calculate the area of parallelograms |

			Know the number of seconds in a minute and the number of days in each month, year and leap year Compare durations of events [for example, to calculate the time taken by particular events or tasks]	[for example, using 1 cm³ blocks to build cuboids (including cubes)] and capacity [for example, using water] Solve problems involving converting between units of time Use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling	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]

Tell and write the time to 5 minutes, including quarter past/to the hour and draw the hands on a clock face to show these times.

Know the number of minutes in an hour and the number of hours in a day.

| Geometry-Properties of Shapes | Spatial awareness of movement.

Name simple 2-D shapes.

Name simple 3-D shapes. | Recognise and name common 2-D and 3-D shapes. | Identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line.

Identify and describe the properties of 3-D shapes ,the number of edges, vertices and faces.

identify 2-D shapes on the surface of 3-D shapes.

Compare and sort common 2-D and 3-D shapes and everyday objects. | Draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them

Recognise angles as a property of shape or a description of a turn

Identify right angles, recognise that 2 right angles make a half-turn, 3 make three-quarters of a turn and 4 a complete turn; identify whether angles are greater than or less than a right angle | 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 2 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 | Identify 3-D shapes, including cubes and other cuboids, from 2-D representations

Know angles are measured in degrees: estimate and compare acuteobtuse and reflex angles

Draw given angles, and measure them in degrees (°)

Identify:
Angles at a point and 1 whole turn (total 360°)
Angles at a point on a straight line and half a turn (total 180°)
Other multiples of 90° | Draw 2-D shapes using given dimensions and angles

Recognise, describe and build simple 3-D shapes, including making nets

Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons

Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is |

						Use the properties of rectangles to deduce related facts and find missing lengths and angles	twice the radius
				Identify horizontal and vertical lines and pairs of perpendicular and parallel lines				Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles
							Distinguish between regular and irregular polygons based on reasoning about equal sides and angles	
Geometry- Position and Direction	Making simple patterns. Exploring more complex patterns.	Describe position, direction and movement, including whole, half, quarter and three-quarter turns.	Order and arrange combinations of mathematical objects in patterns and sequences. Use mathematical vocabulary to describe position, direction and movement, including movement in a			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	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.	Describe positions on the full coordinate grid (all 4 quadrants) Draw and translate simple shapes on the coordinate plane, and reflect them in the axes

			straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and 3-quarter turns.		Plot specified points and draw sides to complete a given polygon		
Statistics			Interpret and construct simple pictograms, tally charts, block diagrams and tables. Ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity. Ask and answer questions about totalling and comparing categorical data.	Interpret and present data using bar charts, pictograms and tables 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	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	Solve comparison, sum and difference problems using information presented in a line graph. Complete, read and interpret information in tables, including timetables.	Interpret and construct pie charts and line graphs and use these to solve problems Calculate and interpret the mean as an average

Ratio and Proportion							Solve problems involving the relative sizes of 2 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							Use simple formulae

Generate and describe linear number sequences

Express missing number problems algebraically

Find pairs of numbers that satisfy an equation with 2 unknowns

Enumerate possibilities of combinations of 2 variables |