	Great Whelnetham C of E Primary School Progression of Skills and Knowledge Document Subject Area: Mathematics
Age 3 to 4	• Develop fast recognition of up to 3 objects, without having to count them individually ('subitising'). • Recite numbers past 5. • Say one number for each item in order: 1,2,3,4,5. • Know that the last number reached when counting a small set of objects tells you how many there are in total ('cardinal principle'). • Show 'finger numbers' up to 5. • Link numerals and amounts: for example, showing the right number of objects to match the numeral, up to 5. • Experiment with their own symbols and marks as well as numerals. • Solve real world mathematical problems with numbers up to 5. • Compare quantities using language: 'more than', 'fewer than'. • Talk about and explore 2D and 3D shapes (for example, circles, rectangles, triangles and cuboids) using informal and mathematical language: 'sides', 'corners'; 'straight', 'flat', 'round'. • Understand position through words alone – for example, "The bag is under the table," – with no pointing. • Describe a familiar route. • Discuss routes and locations, using words like 'in front of' and 'behind'. • Make comparisons between objects relating to size, length, weight and capacity • Select shapes appropriately: flat surfaces for building, a triangular prism for a roof, etc. • Combine shapes to make new ones – an arch, a bigger triangle, etc. • Talk about and identify the patterns around them. For example: stripes on clothes, designs on rugs and wallpaper. Use informal language like 'pointy', 'spotty', 'blobs', etc. • Extend and create ABAB patterns – stick, leaf, stick, leaf.

	• Notice and correct an error in a repeating pattern. • Begin to describe a sequence of events, real or fictional, using words such as 'first', 'then…'
Reception	• Count objects, actions and sounds. • Subitise • Link the number symbol (numeral) with its cardinal number value • Count beyond 10 • Compare numbers • Understand the 'one more than/one less than' relationship between consecutive numbers. • Explore the composition of numbers to 10. • Automatically recall number bonds for numbers 0 – 5 and some to 10. • Select, rotate and manipulate shapes to develop spatial reasoning skills. • Compose and decompose shapes so that children recognise a shape can have other shapes within it, just as numbers can. • Continue, copy and create repeating patterns. • Compare length, weight and capacity.
ELG	Mathematics ELG: Number • Have a deep understanding of number to 10, including the composition of each number • Subitise (recognise quantities without counting) up to 5 • Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts. ELG: Numerical Patterns • Verbally count beyond 20, recognising the pattern of the counting system • Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity • Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.

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Skills and Progression	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Counting	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 multiples of twos, fives and tens.	Count in steps of 2,3 and 5 from 0, andin tens from any number, forwards and backwards.	Count from 0 in multiples of 4, 8, 50 and 100. Find 10 or 100 moreor less than a given number.	Count in multiples of6, 7, 9, 25 and 1000. Find 1000 more or less than a given number. Count backwards through zero, to include negative numbers.	Count forwards or backwards in steps of powers of 10 for any given number upto 1,000,000. Count forwards and backwards with positive and negative whole numbers, including through zero.	Use negative numbers in context and calculate intervals across zero.
Place Value		Recognise the place value of each digit ina two-digit number (tens and ones). Compare and order numbers from 0 up to 100. Use <, > and =signs. Read and write	Recognise the place value of each digit ina three-digit number (hundreds, tens and ones). Compare and order numbers up to 1000. Read and write numbers up to 1000 in numerals and in words.	Recognise the place value of each digit ina four-digit number (thousands, hundreds, tens and ones). Compare and order numbers beyond 1000. Round any number to the nearest 10,	Read, write, order and compare numbers to at least 1,000,000 and determine the valueof each digit. Interpret negative numbers in context. Round any number up to 1,000,000 to the nearest 10, 100,	Read, write, orderand compare numbers up to 10,000,000 and determine the value of each digit. Round any whole number to a requireddegree of accuracy. Use

		numbers to at least 100 in numerals and in words.		100 or 1000.	1000, 10 000 and 100 000.	
Representing Number	Identify and represent numbers using objects and pictorial representations including the number line. Use the language of: equal to, more than, less than (fewer), most and least. Read and write numbers from 1 to 20 in numerals and words.	Identify, represent and estimate numbers using different representations, including the number line.	Identify, represent and estimate numbers using different representations.	Identify, representand estimate numbers using different representations. Read Roman Numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of zero and place value.	Read Roman Numerals to 1000 (M) and recognise years in Roman Numerals.	
Number Facts (Additionand Subtraction)	Given a number, identify one more and one less. Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs. Represent and use	Use place value and number facts to solve problems. Recall and use addition and subtraction facts to 20 fluently. Derive and use related facts up to 100.				

	number bonds and related subtraction facts within 20.					
Mental Addition and Subtraction	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 and adding three one-digit numbers. 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 and a three-digit number and hundreds.		Add and subtract numbers mentally with increasingly large numbers,	Perform mental calculations, including mixed operations and large numbers.
Written Addition and Subtraction			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.	
Addition and Subtraction Problems	Solve one-step problems that involve addition and	Solve problems with addition and subtraction using	Estimate the answer to a calculation and use inverse	Estimate and use inverse operations to check answers to a	Use rounding to check answers to calculations and	Solve problems involving addition, subtraction,

	subtraction, using concrete objects and pictorial representations. Solve missing number problems.	concrete, pictorial and abstract representations. Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.	operations to check answers. Solve problems, including missing number problems, using number facts, place value and more complex addition and subtraction.	calculation. Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why.	determine, in the context of a problem, levels of accuracy. Solve addition and subtraction multi- step problems in contexts, deciding which operations andmethods to use and why.	multiplication anddivision. Use estimation to check answers to calculations and determine, in the context of a problem,an appropriate degree of accuracy.
Number Facts (Multiplication andDivision)		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 the3, 4 and 9 multiplication tables.	Recall multiplication and division facts for multiplication tables up to 12 x 12.	Identify multiples and factors, including finding all factor pairsof a number, and common factors of two 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 to19. Recognise and use square numbers and	Identify common factors, common multiples and primenumbers.

					cube numbers, and the notation for squared (^{2}) and cubed (^{3}).	
Mental Multiplication and Division		Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (x), division (÷) and equals (=) signs. Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot.	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 methods.	Use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers. Recognise and use factor pairs and commutativity in mental calculations.	Multiply and divide numbers mentally drawing upon known facts. Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000.	Perform mental calculations, including with mixed operations and large numbers.
Written Multiplicationand Division			Progress to using formal written methods to multiply two-digit numbers by one-digit numbers.	Multiply two-digit andthree-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	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 to4 digits by a two-digit whole number using the formal written

					the formal written method of short division and interpret remainders appropriately for the context.	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 where appropriate, interpreting remainders according to the context.
Multiplication and Division Problems	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.	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	Use their knowledge of the order of operations to carry out calculations involving four operations. Solve problems involving addition, subtraction, multiplication and division. Use estimation to

					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.	check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.
Recognising Fractions	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, ¼, 2/4 and ¾ of a length, shape, set of objectsor quantity.	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,	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).	
Comparing Fractions			Compare and order unit fractions, and fractions with the same denominator. Recognise and show, using diagrams, equivalent fractions with small denominators.	Recognise and show, using diagrams, families ofcommon equivalent fractions.	Compare and order fractions whose denominators are all multiples of the same number. Identify, name and write equivalent fractions of a given fraction, represented	Use common factors to simplify fractions. Use common multiples to express fractions in the same denomination. Compare and order fractions, including

					visually, including tenths and hundredths.	fractions >1.
Finding Fractions of Quantities			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.	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.		
Calculating Fractions		Write simple fractions for example, ½ of 6 = 3 and recognise the equivalence of 2/4 and ½.	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. Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams.	Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions. Multiply simple pairs of proper fractions, writing the answer in its simplest form. Divide proper fractions by whole numbers.
Decimals as Fractional Amounts				Recognise and write decimal equivalents	Read and write decimal numbers as	Associate a fraction with division and

				of any number of tenths or hundredths. Recognise and write decimal equivalents to ¼, ½ and ¾. 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.	fractions.	calculate fraction equivalents for a simple fraction (for example, 3/8 = 0.375). Identify the value of each digit in numbers with three decimal places.
Ordering Decimals				Round decimals with one decimal place to the nearest whole number. Compare numbers with the same number of decimal places, up to two decimal places.	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.	
Calculating with Decimals						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.
Percentages					Recognise the percent symbol and understand that per cent relates to 'number of parts per hundred'. Write percentages asa fraction with denominator 100, and as a decimal.	Solve problems involving the calculation of percentages (for example, of measures, and such as 15% of 360) and the use of percentages for comparison.
Fraction and Decimal Problems			Solve problems using all fraction knowledge.	Solve simple measure and money problems involving fractions and decimals to two decimal places.	Solve problems involving numbers with up to three decimal places. Solve problems which require knowing percentage and decimal equivalents of ½, ¼, 1/5, 2/5, 4/5 and	Solve problems which require answers to be rounded to specified degrees of accuracy. Recall and use equivalences between simple fractions, decimalsand percentages,

					those fractions with a denominator of a multiple of 10 or 25.	including in different contexts.
Ratio and Proportion						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 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 two unknowns. Enumerate possibilities of combinations of two variables.
Measures	Compare, describe and solve practical problems for: lengths/heights, mass/weights, capacity/volume and time. Measure and begin to record the following: lengths/heights, mass/weights, capacity/volume and time.	Choose and use appropriate standard units to estimate and measure length/height, mass, temperature and capacity to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels. Compare and order lengths, mass and volume/capacity and record the results using >, < and =.	Measure, compare,add and subtract lengths, mass, volume/capacity.	Convert between different units of measure, for example, kilometres to metres and hours to minutes. Estimate, compare and calculate different measures, including money in pounds and pence.	Convert between different units of metric measure (for example, km and m; cm and m; cm and mm; g and kg; l and ml). Understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints. Use all four operations to solve problems involving measure, 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. 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, up to three decimal places. Convert between miles and kilometres.
Money	Recognise and know	Recognise and use	Add and subtract			

	the value of different denominations of coins and notes.	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.	amounts of money to give change, using both £ and p in practical contexts.			
Time	Sequence events in chronological order. 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	Compare and sequence intervals of time. 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. Know the number of minutes in an hour	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.	Convert between different units of measures, for example, hours to minutes. Read, write and convert time between analogue and digital 12- and 24-hour clocks. Solve problems involving converting	Solve problems involving converting between units of time.	

	times.	and the number of hours in a day.	Record and compare time in terms of seconds, minutes and hours. Use vocabulary suchas o'clock, a.m./p.m., morning, afternoon, noon and midnight. Know the number of seconds in a minute and the number of days in each month, year and leap year. Compare durations of events.	from hours to minutes; minutes to seconds; years to months and weeks to days.		
Area, Perimeter and Volume			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 and square metres.	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 the area of irregular shapes. Estimate volume (for example, using 1cm^3 blocks to build cuboids) and capacity (for example, using water).	Calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres and cubic metres, and extending to other units (for examples, mm^3 and km^3).
Properties of 2-D Shapes	Recognise and name common 2-D shapes, including rectangles, 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. Compare and sort common 2-D and 3-D shapes and everyday objects.	Draw 2-D shapes.	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.	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.	Draw 2-D shapes using given dimensions and angles. Compare and classify geometric shapes based on their properties and sizes. 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 twice the radius.
Properties of 3-D Shapes	Recognise and	Identify and describe	Make 3-D shapes		Identify 3-D shapes,	Recognise, describe

	name common 3-D shapes, including cuboids, cubes, pyramids and spheres.	the properties of 3-D shapes, including the number of edges, vertices and faces. 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.	using modelling materials. Recognise 3-D shapes in different orientations and describe them.		including cubes and other cuboids, from 2-D representations.	and build simple 3-D shapes, including making nets.
Angles			Recognise angles asa 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 a 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; angles at a point on a straight line and ½ a turn; other multiples of	Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles.

			Identify horizontal and vertical lines and pairs of perpendicular and parallel lines.		90°.	
Position and Direction	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 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. Describe movements between positions as translations of a given unit to the left/right and up/down. Plot specified points and draw sides to complete a given polygon.	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 four quadrants). Draw and translate simple shapes on the coordinate plane, and reflect them in the axes.
Interpreting Data		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 chartsand time graphs.	Complete, read and interpret information in tables, including timetables.	Interpret and construct pie charts and line graphs. Calculate and interpret the mean as an average.
Extracting Information		Ask and answer	Solve one-step and	Solve comparison,	Solve comparison,	Use pie charts and

from Data		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.	two-step questions (for example, 'How many more?' and 'How many fewer?') using information presented in scaled bar charts and pictograms and tables.	sum and difference problems using information presented in bar charts, pictograms, tables and other graphs.	sum and difference problems using information presented in a line graph.	line graphs to solve problems.