St Austin's RC Primary School

Mathematics Progression Statement KS2

	Year 3	Year 4	Year 5	Year 6
Number and place value				
counting (in multiples)	count from 0 in multiples of 4, 8, 50 and 100	count in multiples of 6, 7, 9, 25 and 1,000	count forwards or backwards in steps of powers of 10 for any given number up to 1,000,000	
read, write, order and compare numbers	compare and order numbers up to 1,000 read and write numbers to 1,000 in numerals and in words	order and compare numbers beyond 1,000	read, write, order and compare numbers to at least 1,000,000	read, write, order and compare numbers up to 10,000,000
	find 10 or 100 more or less than a given number	find 1,000 more or less than a given number		
place value; roman numerals	recognise the place value of each digit in a three-digit number (hundreds, tens, ones)	recognise the place value of each digit in a four- digit number (thousands, hundreds, tens and ones)	determine the value of each digit in numbers up to 1,000,000	determine the value of each digit in numbers up to 10,000,000
		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 1,000 (M) and recognise years written in Roman numerals	
identify, represent and estimate; rounding	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 1,000	round any number up to 1,000,000 to the nearest 10, 100, 1,000, 10,000 and 100,000	
negative numbers		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	
number problems	solve number problems and practical problems involving **the above (3N1-3)**	solve number and practical problems that involve **the above (4N1-5)**and with increasingly large positive numbers	solve number problems and practical problems that involve **the above** (5N1–5N5)	

Addition, subtraction, multiplication and division (calculations)				
add / subtract mentally	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	
add / subtract using written methods	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)	
estimate, use inverses and check	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	use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy
add / subtract to solve problems	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
properties of number (multiples, factors, primes, squares and cubes)			identify multiples and factors, including finding all factor pairs of a number and common factors of two numbers	identify common factors, common multiples and prime 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	
			recognise and use square numbers and cube numbers, and the notation for squared (2) and cubed (3)	
multiply / divide mentally	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
		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 1,000	

		recognise and use factor pairs and commutativity in mental calculations		
multiply / divide using written methods	write and calculate mathematical statements for multiplication and division using the multiplication tables that pupils 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	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 one-digit number using the formal written method of short division and interpret remainders appropriately for the context		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 where appropriate, interpreting remainders according to the context
solve problems (commutative, associative, distributive and all four operations)	solve problems, including missing number problems, involving multiplication and division, including 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
			solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign	
			solve problems involving multiplication and division including scaling by simple fractions and problems involving simple rates	
order of operations				use their knowledge of the order of operations to carry out calculations involving the four operations

Fractions, decimals and percentages				
recognise, find, write, name and count 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 a hundred and dividing tenths by ten		
	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 the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred'; write percentages as a fraction with denominator hundred, and as a decimal	recall and use equivalences between simple fractions, decimals and percentages, including in different contexts
equivalent fractions	recognise and show, using diagrams, equivalent fractions with small denominators	recognise and show, using diagrams, families of common equivalent fractions	recognise mixed numbers and improper fractions and convert from one form to the other; write mathematical statements >1 as a mixed number e.g. $\frac{2}{5}+\frac{4}{5}=\frac{6}{5}=1\frac{1}{5}$	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	
comparing and ordering fractions	compare and order unit fractions and fractions with the same denominators		compare and order fractions whose denominators are all multiples of the same number	compare and order fractions, including fractions >1
add / subtract fractions	add and subtract fractions with the same denominator within one whole e.g. $\frac{5}{7}+\frac{1}{7}=\frac{6}{7}$	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
multiply / divide fractions			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 e.g. $\frac{1}{4}\times\frac{1}{2}=\frac{1}{8}$
				divide proper fractions by whole numbers e.g. $\frac{1}{3}\div 2=\frac{1}{6}$

fractions / decimals equivalence		recognise and write decimal equivalents to $\frac{1}{4}, \frac{1}{2}, \frac{3}{4}$	read and write decimal numbers as fractions [e.g. 0.71 = $\frac{71}{100}$]	associate a fraction with division to calculate decimal fraction equivalents e.g. 0.375 for a simple fraction $\frac{3}{8}$
		recognise and write decimal equivalents of any number of tenths or hundredths	recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents	
rounding decimals		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	
compare and order decimals		compare numbers with the same number of decimal places up to two decimal places	read, write, order and compare numbers with up to three decimal places	
multiply / divide decimals		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		identify the value of each digit to three decimal places and multiply and divide numbers by 10, 100 and 1,000 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
solve problems with fractions and decimals	solve problems that involve **3F1–3F4**	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 problems involving numbers up to three decimal places	solve problems which require answers to be rounded to specified degrees of accuracy
		solve simple measure and money problems involving fractions and decimals to two decimal places		
fractions / decimal / percentage equivalence			recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred'; write percentages as a fraction with denominator hundred, and as a decimal	recall and use equivalences between simple fractions, decimals and percentages, including in different contexts
solve problems with percentages			solve problems that require knowing percentage and	

			decimal equivalents of $\frac{1}{2}, \frac{1}{4}, \frac{1}{5}, \frac{2}{5}, \frac{4}{5}$ those fractions with a denominator of a multiple of 10 or 25	
Ratio and proportion				
relative sizes, similarity				solve problems involving the relative sizes of two quantities, where missing values can be found by using integer multiplication and division facts
use of percentages for comparison				solve problems involving the calculation of percentages [e.g. of measures such as 15% of 360] and the use of percentages for comparison
scale factors				solve problem involving similar shapes where the scale factor is known or can be found
unequal sharing and grouping				solve problems involving unequal sharing and grouping using knowledge of fractions and multiples
Algebra				
missing number problems expressed in algebra				express missing number problems algebraically
simple formulae expressed in words				use simple formulae
generate and describe linear number sequences				generate and describe linear number sequences
number sentences involving two unknowns				find pairs of numbers that satisfy an equation with two unknowns

enumerate all possibilities of combinations of two variables				enumerate possibilities of combinations of two variables
Measurement				
compare, describe and order measures	compare lengths (m / cm / mm)	compare different measures, including money in pounds and pence		
	compare mass (kg / g)			
	compare volume / capacity (l / ml)			
estimate, measure and read scales	measure lengths (m / cm / mm)	estimate different measures, including money in pounds and pence		
	measure mass (kg / g)			
	measure volume / capacity (l / ml)			
telling time, ordering time, duration and units of time	tell and write the time from an analogue clock; 12-hour clocks	read, write and convert time between analogue and digital 12-hour clocks		
	tell and write the time from an analogue clock; 24-hour clocks	read, write and convert time between analogue and digital 24-hour clocks		
	tell and write the time from an analogue clock, including using Roman numerals from I to XII	solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days	solve problems involving converting between units of time	
	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			
	know the number of seconds in a minute and the number of days in each month, year and leap year			
	compare durations of events, [e.g. to calculate the time taken by			

	particular events or tasks]			
convert between metric units		convert between different units of measurement [e.g. kilometre to metre; hour to minute]	convert between different units of metric measure [e.g. kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre]	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 of up to three decimal places
convert metric / imperial			understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints	convert between miles and kilometres
perimeter, area	measure the perimeter of simple 2–D shapes	measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres	measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres	recognise that shapes with the same areas can have different perimeters and vice versa
		find the area of rectilinear shapes by counting squares	calculate and compare the area of rectangles (including squares), and including using standard units, square centimetres (cm^2) and square metres (m^2) and estimate the area of irregular shapes	calculate the area of parallelograms and triangles
				recognise when it is possible to use the formulae for the area of shapes
volume			estimate volume [e.g. using 1 cm^3 blocks to build cuboids (including cubes)] and capacity [e.g. using water]	calculate, estimate and compare volume of cubes and cuboids using standard units, including centimetre cubed (cm^3) and cubic metres (m^3), and extending to other units [e.g. mm^3 and km^3]
				recognise when it is possible to use the formulae for the volume of shapes
solve problems (a, money; b, length; c, mass / weight; d, capacity / volume)	add and subtract amounts of money to give change, using both pounds (£) and pence (p) in practical contexts	calculate different measures, including money in pounds and pence	use all four operations to solve problems involving measures [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
	add and subtract lengths (m / cm /		use all four operations to solve	

	mm)		problems involving measure [e.g. length] using decimal notation, including scaling	
	add and subtract mass (kg / g)		use all four operations to solve problems involving measure [e.g. mass] using decimal notation, including scaling	
	add and subtract volume / capacity (l / ml)		use all four operations to solve problems involving measure [e.g. volume] using decimal notation, including scaling	
Geometry – properties of shapes				
describe properties and classify shapes	identify horizontal, vertical lines and pairs of perpendicular and parallel lines	compare and classify geometric shapes, including quadrilaterals and triangles based on their properties and sizes	use the properties of rectangles to deduce related facts and find missing lengths and angles	compare and classify geometric shapes based on their properties and sizes
		identify lines of symmetry in 2-D shapes presented in different orientations	distinguish between regular and irregular polygons based on reasoning about equal sides and angles	describe simple 3-D shapes
		complete a simple symmetric figure with respect to a specific line of symmetry		
draw and make shapes and relate 2-D to 3-D shapes (including nets)	draw 2-D shapes			draw 2-D shapes using given dimensions and angles
	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 and build simple 3-D shapes, including making nets
angles – measuring and properties	recognise that angles are a property of shape or a description of a turn	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	find unknown angles in any triangles, quadrilaterals and regular polygons
	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: • angles at a point and one whole turn (total 360^o) • angles at a point on a straight line and $\frac{1}{2}$ a turn (total 180^o) • other multiples of 90^o	recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles
			draw given angles	

			and measure them in degrees (°)	
circles				illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius
Geometry – position and direction				
describe position, direction and movement		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 co-ordinate plane, and reflect them in the axes
co-ordinates		describe positions on a 2-D grid as co-ordinates in the first quadrant		describe positions on the full co-ordinate grid (all four quadrants)
		plot specified points and draw sides to complete a given polygon		
Statistics				
interpret and represent data	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
solve problems involving data	solve one-step and two- step questions [e.g. 'How many more?' and 'How many fewer?'] using information presented in scaled bar charts, 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	
mean average				calculate and interpret the mean as an average