## MATHS AT ALBAN CITY SCHOOL

(Please see separate Maths Strands document for more detail and guidance)

The Maths curriculum at Alban City School is designed to help children become confident mathematicians who can approach everyday problems with ease. A broad range of skills are taught, including teaching a range of different written calculation methods so that the children can select the method they feel most confident using. Key concepts are also taught in a variety of different contexts; this enables pupils to deepen their understanding and transfer their skills.

The Herts for Learning PA Plus scheme is utilised to allow for a clear progression of skills across the entire mathematical curriculum. At least four lessons a week are taught in each year group as well as additional arithmetic or fluency sessions. The key maths strands include: Number (including fractions, decimals and percentages), Calculation, Ratio and Proportion, Algebra, Measurement, Shape and Space and Statistics. Teachers use this outlined progression as a starting point, adapting the content appropriately for the individual pupils in their class to design engaging lessons. Regular formative assessment is undertaken to help teachers identify whether to revisit key concepts or extend pupils' learning further. Within Maths lessons, extension and mastery tasks are also provided to deepen knowledge and understanding. Throughout lessons, regular opportunities are provided to practise the taught skills so that children can approach individual activities with confidence. This is also supported through the use of CLIC and SAFE tests to practise key skills weekly; any misconceptions are addressed with pupils 1:1 or in a small group to close gaps in pupils' knowledge.

Teachers are also encouraged to plan opportunities for pupils to use their mathematical skills across the curriculum, for example, learning about the Mayan number system which uses base 20, or producing statistical diagrams to record results in Science. Story books which include mathematical ideas are also available and help children to engage in lessons.

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

	Count objects, actions	Count to and across	Count in steps of 2, 3,	Count from 0 in	Count in multiples of	Read, write, order and	Read, write, order
	and sounds.	100, forwards and	and 5 from 0, and in	multiples of 4, 8, 50	6, 7, 9, 25 and 1000.	compare numbers up	and compare
		backwards, beginning	tens from any number,	and 100; find 10 or 100		to 10,000,000 and	numbers up to
	Subitise.	with 0 or 1, or from	forward or backward.	more or less than a	Find 1000 more or less	determine the value of	10,000,000 and
		any given number.		given number.	than a given number.	each digit.	determine the value
	Link the number		Recognise the place		_	_	of each digit.
	symbol (numeral) with	Count, read and write	value of each digit in a	Recognise the place	Count backwards	Round any whole	
	its cardinal number	numbers to 100 in	two-digit number	value of each digit in a	through zero to	number to a required	Round any whole
	value.	numerals; count in	(tens, ones)	three-digit number	include negative	degree of accuracy.	number to a required
		multiples of twos, fives		(hundreds, tens, ones)	numbers.		degree of accuracy.
	Count beyond ten.	and tens.	Identify, represent and			Use negative numbers	
			estimate numbers	Compare and order	Recognise the place	in context, and	Use negative
	Compare numbers.	Given a number,	using different	numbers up to 1000.	value of each digit in a	calculate intervals	numbers in context,
		identify one more and	representations,	Identify, represent and	four-digit number	across zero.	and calculate
	Understand the 'one	one less.	including the number	estimate numbers	(thousands, hundreds,		intervals across zero.
	more than/one less		line.	using different	tens, and ones)	Solve number and	
a)	than' relationship	Identify and represent		representations.		practical problems that	Solve number and
<u>ă</u>	between consecutive	numbers using objects	Compare and order		Order and compare	involve all of the	practical problems
Number and Place Value	numbers.	and pictorial	numbers from 0 up to	Read and write	numbers beyond 1000.	above.	that involve all of the
O	e 1	representations	100; use <, > and =	numbers up to 1000 in			above.
<u>a</u>	Explore the	including the number	signs.	numerals and in	Identify, represent and		
<u> </u>	composition of	line, and use the	Dandand	words.	estimate numbers		
an	numbers to 10.	language of: equal to,	Read and write numbers to at least	Solve number	using different		
ē	Automatically recall	more than, less than (fewer), most, least	100 in numerals and in	problems and practical	representations.		
ď	number bonds for	(Tewer), ITIOSE, Tease	words.	problems involving	Round any number to		
<u>n</u>	numbers 0–10	Read and write	words.	these ideas.	the nearest 10, 100 or		
Z	Humbers 0–10	numbers from 1 to 20	Use place value and	tilese ideas.	1000.		
		in numerals and	number facts to solve		1000.		
		words.	problems.		Solve number and		
			p. c.a.c.		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 zero and place value.		
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Automatically recall number bonds for numbers 0–10  Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally	Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs.  Represent and use number bonds and related subtraction facts within 20.  Add and subtract one-digit and two-digit numbers to 20, including zero.  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:  - using concrete objects and pictorial representations, including those involving numbers, quantities and measures  - applying their increasing knowledge of mental and written methods  Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100.  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	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 with up to three digits, using formal written methods of columnar addition and subtraction.  Estimate the answer to a calculation and use inverse operations to check answers.  Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction.	Add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate.  Estimate and use inverse operations to check answers to a calculation.  Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why.	Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction).  Add and subtract numbers mentally with increasingly large numbers.  Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy.  Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.	Perform mental calculations, including with mixed operations and large numbers.  Use their knowledge of the order of operations to carry out calculations involving the four operations.  Solve addition and subtraction multistep problems in contexts, deciding which operations and methods to use and why.  Solve problems involving addition and subtraction, use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.
		one-digit numbers Show that addition of				

two numbers can be

done in any order (commutative) and subtraction of one number from another cannot.		
Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and missing number problems.		

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Explore and represent
patterns within
numbers up to 10,
including evens and
odds, double facts and
how quantities can be
distributed equally

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 tables
and write them using
the multiplication (×),
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

Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts.

Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables.

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.

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.

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 three numbers.

Recognise and use factor pairs and commutativity in mental calculations.

Multiply two-digit and three-digit numbers by a one-digit number using formal written layout.

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.

Identify multiples and factors, including finding all factor pairs of 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 to 19.

Multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for twodigit 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 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 where appropriate, interpreting remainders according to the context.

Perform mental calculations, including with mixed operations and large numbers.

	T	1	<u>,                                      </u>		
				Multiply and divide	
				whole numbers and	Identify common
				those involving	factors, common
				decimals by 10, 100	multiples and prime
				and 1000.	numbers.
				Recognise and use	Use their knowledge
				square numbers and	of the order of
				cube numbers, and the	operations to carry
				notation for squared	out calculations
				(²) and cubed (³)	involving the four
				( ) ( )	operations.
				Solve problems	-1
				involving	Solve addition and
				multiplication and	subtraction multi-
				division including using	step problems in
				their knowledge of	contexts, deciding
				factors and multiples,	which operations
				squares and cubes.	and methods to use
				5qua. 55 a.i.a 5a.555.	and why.
				Solve problems	and why.
				involving addition,	Solve problems
				subtraction,	involving addition,
				multiplication and	subtraction,
				division and a	multiplication and
				combination of these,	division.
				including	Use estimation to
				understanding the	check answers to
				meaning of the equals	calculations and
				sign.	determine, in the
				J	context of a problem,
				Solve problems	an appropriate
				involving	degree of accuracy.
				multiplication and	
				division, including	
				scaling by simple	
				fractions and problems	
				involving simple rates.	
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Fractions, Decimals and Percentages	name a h two equa object, sh quantity  Recognis name a q of four ed	Recognise, find, national and write fractions are writed and writ	tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10	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  Add and subtract fractions with the same denominator  Recognise and write decimal equivalents of any number of tenths or hundredths	Compare and order fractions whose denominators are all multiples of the same number  Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths  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 = 11/5)  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  Read and write decimal numbers as	Use common factors to simplify fractions; use common multiples to express fractions in the same denomination  Compare and order fractions, including fractions >1  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 (for example, \frac{1}{4} \times \frac{1}{2} = \frac{1}{8}\)  Herts for Learning — Teaching and Learning Divide proper fractions by whole numbers (for example, \frac{1}{3} \div 2 = \frac{1}{6}\)  Associate a fraction with division and calculate decimal fraction equivalents (for example, 0.375)
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		Solve problems that	100, identifying the	fractions (for example,	for a simple fraction
		involve all of the above	value of the digits in	$0.71 = ^{71}/_{100}$	(for example, $^{3}/_{8}$ )
			the answer as ones,		
			tenths and hundredths	Recognise and use	Identify the value of
				thousandths and	each digit in numbers
			Round decimals with	relate them to tenths,	given to three
			one decimal place to	hundredths and	decimal places and
			the nearest whole	decimal equivalents	multiply and divide
			number		numbers by 10, 100
				Round decimals with	and 1000 giving
			Compare numbers	two decimal places to	answers up to three
			with the same number	the nearest whole	decimal places
			of decimal places up to	number and to one	
			two decimal places	decimal place	Multiply one-digit
					numbers with up to
			Solve simple measure	Read, write, order and	two decimal places
			and money problems	compare numbers	by whole numbers
			involving fractions and	with up to three	
			decimals to two	decimal places	Use written division
			decimal places		methods in cases
				Solve problems	where the answer
				involving number up	has up to two
				to three decimal	decimal places
				places	
					Solve problems
				Recognise the per cent	which require
				symbol (%) and	answers to be
				understand that per	rounded to specified
				cent relates to "number of parts per	degrees of accuracy
				hundred", and write	Recall and use
				percentages as a	equivalences
				fraction with	between simple
				denominator 100, and	fractions, decimals
				as a decimal	and percentages,
				as a accimal	including in different
				Solve problems which	contexts
				require knowing	CONTEXES
				percentage and	
				percentage and	

		decimal equivalents of $^{1}/_{2}$ , $^{1}/_{4}$ , $^{1}/_{5}$ , $^{2}/_{5}$ , $^{4}/_{5}$ and those with a
		denominator of a
		multiple of 10 or 25

				Solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts
n and Algebra				Solve problems involving the calculation of percentages [for example, of measures, such as 15% of 360] and the use of percentages for comparison
Ratio, Proportion and Algebra				Solve problems involving similar shapes where the scale factor is known or can be found
æ				Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples
				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

	Compare length,	Compare, describe and	Choose and use	Measure, compare,	Convert between	Convert between	Solve problems
	weight and capacity.	solve practical	appropriate standard	add and subtract:	different units of	different units of	involving the
		problems for:	units to estimate and	lengths (m/cm/mm);	measure (for example,	metric measure (for	calculation and
		lengths and heights	measure length/height	mass (kg/g);	kilometre to metre;	example, kilometre	conversion of units
		[for example,	in any direction	volume/capacity (I/mI)	hour to minute)	and metre; centimetre	of measure, using
		long/short,	(m/cm); mass (kg/g);			and metre; centimetre	decimal notation up
		longer/shorter,	temperature (°C);	Measure the	Measure and calculate	and millimetre; gram	to three decimal
		tall/short,	capacity (litres/ml) to	perimeter of simple 2-	the perimeter of a	and kilogram; litre and	places where
		double/half]	the nearest	D shapes	rectilinear figure	millilitre)	appropriate
		mass / weight [for	appropriate unit, using		(including squares) in		
		example,	rulers, scales,	Add and subtract	centimetres and	Understand and use	Use, read, write and
		heavy/light, heavier	thermometers and	amounts of money to	metres	approximate	convert between
		than, lighter than]	measuring vessels	give change, using		equivalences between	standard units,
		capacity and volume	Compare and order	both £ and p in	Find the area of	metric units and	converting
		[full/empty, more	lengths, mass,	practical contexts	rectilinear shapes by	common imperial units	measurements of
		than, less than, half,	volume/capacity and	Tell and write the time	counting squares	such as inches, pounds	length, mass, volume
±		half full, quarter]	record the results	from an analogue	Estimate, compare and	and pints	and time from a
e		time [quicker,	using >, < and =	clock, including using	calculate different		smaller unit of
eπ		slower, earlier, later]		Roman numerals from	measures, including	Measure and calculate	measure to a larger
ı n			Recognise and use	I to XII, and 12-hour	money in pounds and	the perimeter of	unit, and vice versa,
Measurement		Measure and begin to	symbols for pounds (£)	and 24-hour clocks	pence	composite rectilinear	using decimal
Me		record the following:	and pence (p);			shape s in centimetres	notation to up to
		<ul> <li>lengths and</li> </ul>	combine amounts to	Estimate and read	Read, write and	and metres	three decimal places
		heights	make a particular	time with increasing	convert time between		
		- mass/weight	value	accuracy to the	analogue and digital	Calculate and compare	Convert between
		- capacity and	_, , ,,,,,,	nearest minute; record	12 and 24-hour clocks	the area of rectangles	miles and kilometres
		volume	Find different	and compare time in		(including squares)	
		- time (hours,	combinations of coins	terms of seconds,	Solve problems	using standard units,	Recognise that
		minutes,	that equal the same	minutes and hours;	involving converting	square centimetres	shapes with the
		seconds)	amounts of money	use vocabulary such as	from hours to minutes;	(cm²) and square	same areas can have
				o'clock, a.m./p.m.,	minutes to seconds;	metres (m <sup>2</sup> ) and	different perimeters
		Recognise and know	Solve simple problems	morning, afternoon,	years to months;	estimate the area of	and vice versa
		the value of different	in a practical context	noon and midnight	weeks to days	irregular shapes	
		denominations of	involving addition and			Fating to the line of the second	Recognise when it is
		coins and notes	subtraction of money	Know the number of		Estimate volume [for	possible to use
		Coguence succession	of the same unit,	seconds in a minute		example, using 1 cm <sup>3</sup>	formulae for area
		Sequence events in	including giving change	and the number of		blocks to build cuboids	and volume of
		chronological order		days in each month,		(including cubes)] and	shapes
		using language [for		year and leap year			

example, before and	Compare and		capacity (for example,	Calculate the area of
after, next, first, today,	sequence intervals of	Compare durations of	using water)	parallelograms and
yesterday, tomorrow,	time	events [for example to		triangles
morning, afternoon		calculate the time	Solve problems	
and evening]	Tell and write the time	taken by particular	involving converting	Calculate, estimate
	to five minutes,	events or tasks]	between units of time	and compare volume
Recognise and use	including quarter			of cubes and cuboids
language relating to	past/to the hour and		Use all four operations	using standard units,
dates, including days	draw the hands on a		to solve problems	including centimetre
of the week, weeks,	clock face to show		involving measure [for	cubed (cm³) and
months and years	these times.		example, length, mass,	cubic metres (m³),
			volume, money] using	and extending to
Tell the time to the	Know the number of		decimal notation	other units [for
hour and half past the	minutes in an hour and		including scaling	example, mm <sup>3</sup> and
hour and draw the	the number of hours in			km³]
hands on a clock face	a day			
to show these times				

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Select, rotate and	Recognise and name	Identify and describe	<b>D</b> raw 2-D shapes and	Compare and classify	Identify 3-D shapes,	Draw 2-D shapes
manipulate shapes in	common 2-D and 3-D	the properties of 2-D	make 3-D shapes using	geometric shapes,	including cubes and	using given
order to develop	shapes, including:	shapes, including the	modelling materials;	including	other cuboids, from 2-	dimensions and
spatial reasoning skills.		number of sides and	recognise 3-D shapes	quadrilaterals and	D representations	angles
	- 2-D shapes [for	symmetry in a vertical	in different	triangles, based on		
Compose and	example,	line	orientations and	their properties and	Know angles are	Recognise, describe
decompose shapes so	rectangles		describe them	sizes	measured in degrees:	and build simple 3-D
that children recognise	(including	Identify and describe			estimate and compare	shapes, including
a shape can have other	squares), circles	the properties of 3-D	Recognise angles as a	Identify acute and	acute, obtuse and	making nets
shapes within it, just as	and triangles]	shapes, including the	property of shape or a	obtuse angles and	reflex angles	
numbers can	0.0 1 10	number of edges,	description of a turn	compare and order		Compare and classify
	- 3-D shapes [for	vertices and faces		angles up to two right	Draw given angles, and	geometric shapes
Continue, copy and	example, cuboids	Identify 2 Debenden	Identify right angles,	angles by size	measure them in	based on their
create repeating	(including cubes),	Identify 2-D shapes on the surface of 3-D	recognise that two right angles make a	Identify lines of	degrees (°)	properties and sizes and find unknown
patterns	pyramids and spheres]	shapes, [for example a	half-turn, three make	symmetry in 2-D	Identify:	and find unknown angles in any
	spileresj	circle on a cylinder and	three quarters of a	shapes presented in	- angles at a point	triangles,
	Describe position,	a triangle on a	turn and four a	different orientations	and one whole	quadrilaterals, and
	direction and	pyramid]	complete turn; identify	directin orientations	turn (total 360°)	regular polygons
	movement, including	pyraniaj	whether angles are	Complete a simple	- angles at a point	regular polygons
	whole, half, quarter	Compare and sort	greater than or less	symmetric figure with	on a straight line	Illustrate and name
	and three-quarter	common 2-D and 3-D	than a right angle	respect to a specific	and ½ a turn	parts of circles,
	turns	shapes and everyday		line of symmetry	(total 180°)	including radius,
		objects	Identify horizontal and	, ,	- other multiples	diameter and
			vertical lines and pairs	Describe positions on a	of 90°	circumference and
		Order and arrange	of perpendicular and	2-D grid as coordinates		know that the
		combinations of	parallel lines	in the first quadrant	Use the properties of	diameter is twice the
		mathematical objects			rectangles to deduce	radius
		in patterns and		Describe movements	related facts and find	
		sequences		between positions as	missing lengths and	Recognise angles
				translations of a given	angles	where they meet at a
		Use mathematical		unit to the left/right		point, are on a
		vocabulary to describe		and up/down	Distinguish between	straight line, or are
		position, direction and		Plot specified points	regular and irregular	vertically opposite,
		movement, including		and draw sides to	polygons based on	and find missing
		movement in a		complete a given	reasoning about equal	angles
		straight line and		polygon	sides and angles	Dossribo positions on

Describe positions on the full coordinate

distinguishing between rotation as a turn and

	in terms of right angles for quarter, half and three-quarter turns (clockwise and anticlockwise)		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	grid (all four quadrants)  Draw and translate simple shapes on the coordinate plane, and reflect them in the axes

		Interpret and	Interpret and present	Interpret and present	Solve comparison, sum	Interpret and
		construct simple	data using bar charts,	discrete and	and difference	construct pie charts
		pictograms, tally	pictograms and tables	continuous data using	problems using	and line graphs and
		charts, block diagrams		appropriate graphical	information presented	use these to solve
		and simple tables	Solve one-step and	methods, including bar	in a line graph	problems
			two-step questions	charts and time graphs		
		Ask and answer simple	[for example 'How		Complete, read and	Calculate and
		questions by counting	many more?' and	Solve comparison, sum	interpret information	interpret the mean
S		the number of objects	'How many fewer?']	and difference	in tables, including	as an average
Ë		in each category and	using information	problems using	timetables	
Statistics		sorting the categories	presented in scaled	information presented		
ţ		by quantity	bar charts and	in bar charts,		
<b>O</b> ,			pictograms and tables	pictograms, tables and		
		Ask and answer		other graphs		
		questions about				
		totalling and				
		comparing categorical				
		data				