## 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 |
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|  | Count objects, actions and sounds. <br> Subitise. <br> Link the number symbol (numeral) with its cardinal number value. <br> Count beyond ten. <br> Compare numbers. <br> Understand the 'one more than/one less than' relationship between consecutive numbers. <br> Explore the composition of numbers to 10. <br> Automatically recall number bonds for numbers 0-10 | Count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number. <br> Count, read and write numbers to 100 in numerals; count in multiples of twos, fives and tens. <br> Given a number, identify one more and one less. <br> Identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least <br> Read and write numbers from 1 to 20 in numerals and words. | Count in steps of 2, 3, and 5 from 0 , and in tens from any number, forward or backward. <br> Recognise the place value of each digit in a two-digit number (tens, ones) <br> Identify, represent and estimate numbers using different representations, including the number line. <br> Compare and order numbers from 0 up to 100; use <, > and = signs. <br> Read and write numbers to at least 100 in numerals and in words. <br> Use place value and number facts to solve problems. | Count from 0 in multiples of $4,8,50$ and 100 ; find 10 or 100 more or less than a given number. <br> Recognise the place value of each digit in a three-digit number (hundreds, tens, ones) <br> Compare and order numbers up to 1000. Identify, represent and estimate numbers using different representations. <br> Read and write numbers up to 1000 in numerals and in words. <br> Solve number problems and practical problems involving these ideas. | Count in multiples of $6,7,9,25$ and 1000. <br> Find 1000 more or less than a given number. <br> Count backwards through zero to include negative numbers. <br> Recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones) <br> Order and compare numbers beyond 1000. <br> Identify, represent and estimate numbers using different representations. <br> Round any number to the nearest 10,100 or 1000. <br> Solve number and practical problems that involve all of the above and with increasingly large positive numbers. <br> Read Roman numerals to 100 (I to C) and know that over time, the numeral system | Read, write, order and compare numbers up to $10,000,000$ and determine the value of each digit. <br> Round any whole number to a required degree of accuracy. <br> Use negative numbers in context, and calculate intervals across zero. <br> Solve number and practical problems that involve all of the above. | Read, write, order and compare numbers up to 10,000,000 and determine the value of each digit. <br> Round any whole number to a required degree of accuracy. <br> Use negative numbers in context, and calculate intervals across zero. <br> Solve number and practical problems that involve all of the above. |
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|  |  |  | changed to include the <br> concept of zero and <br> place value. |  |  |
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|  |  | done in any order <br> (commutative) and <br> subtraction of one <br> number from another <br> cannot. <br> Recognise and use the <br> inverse relationship <br> between addition and <br> subtraction and use <br> this to check <br> calculations and <br> missing number <br> 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.

 Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication ( $\times$ ), division ( $\div$ ) and equals (=) signsShow 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 onedigit 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 $12 \times 12$.

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



Recognise, find and name a half as one of two equal parts of an object, shape or quantity

Recognise, find and name a quarter as one of four equal parts of an object, shape or quantity

Recognise, find, name and write fractions $1 / 3$, $1 / 4,2 / 4$ and $3 / 4$ of a length, shape, set of objects or quantity

Write simple fractions for example, $1 / 2$ of $6=$ 3 and recognise the equivalence of $2 / 4$ and $1 / 2$

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 nonunit fractions with small denominators

Recognise and use fractions as numbers: unit fractions and nonunit 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, $5 / 7+1 / 7=6 / 7$ )

## Compare and order

 unit fractions, and fractions with the same denominatorsRecognise and show, using diagrams, families of common equivalent fractions

Count up and down in hundredths; recognise that hundredths arise when dividing an object by a hundred and dividing tenths by ten

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

Recognise and write decimal equivalents to $1 / 4,1 / 2,3 / 4$

Find the effect of dividing a one- or twodigit number by 10 and

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, $2 / 5+4 / 5=6 / 5$ $=1^{1} / 5$ )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, $1 / 4 \times 1 / 2$

Herts for Learning Teaching and Learning Divide proper fractions by whole numbers (for example, $1 / 3 \div 2=1 / 6$ )

Associate a fraction with division and calculate decimal fraction equivalents (for example, 0.375)


|  |  |  |  |  | decimal equivalents of <br> $1 / 2,1 / 4,1 / 5,25,4 / 5$ and <br> those with a <br> denominator of $a$ <br> multiple of 10 or 25 |  |
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| $$ | Select, rotate and manipulate shapes in order to develop spatial reasoning skills. <br> Compose and decompose shapes so that children recognise a shape can have other shapes within it, just as numbers can <br> Continue, copy and create repeating patterns | Recognise and name common 2-D and 3-D shapes, including: <br> - 2-D shapes [for example, rectangles (including squares), circles and triangles] <br> - 3-D shapes [for example, cuboids (including cubes), pyramids and spheres] <br> Describe position, direction and movement, including whole, half, quarter and three-quarter turns | Identify and describe the properties of 2-D shapes, including the number of sides and symmetry in a vertical line <br> Identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces <br> Identify 2-D shapes on the surface of 3-D shapes, [for example a circle on a cylinder and a triangle on a pyramid] <br> Compare and sort common 2-D and 3-D shapes and everyday objects <br> Order and arrange combinations of mathematical objects in patterns and sequences <br> Use mathematical vocabulary to describe position, direction and movement, including movement in a straight line and distinguishing between rotation as a turn and | Draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them <br> Recognise angles as a property of shape or a description of a turn <br> 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 <br> Identify horizontal and vertical lines and pairs of perpendicular and parallel lines | Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes <br> Identify acute and obtuse angles and compare and order angles up to two right angles by size <br> Identify lines of symmetry in 2-D shapes presented in different orientations <br> Complete a simple symmetric figure with respect to a specific line of symmetry <br> Describe positions on a 2-D grid as coordinates in the first quadrant <br> 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 3-D shapes, including cubes and other cuboids, from 2D representations <br> Know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles <br> Draw given angles, and measure them in degrees ( ${ }^{\circ}$ ) <br> Identify: <br> - angles at a point and one whole turn (total $360^{\circ}$ ) <br> - angles at a point on a straight line and $1 / 2$ a turn (total $180^{\circ}$ ) <br> - other multiples of $90^{\circ}$ <br> Use the properties of rectangles to deduce related facts and find missing lengths and angles <br> Distinguish between regular and irregular polygons based on reasoning about equal sides and angles | Draw 2-D shapes using given dimensions and angles <br> Recognise, describe and build simple 3-D shapes, including making nets <br> Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons <br> Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius <br> Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles <br> Describe positions on the full coordinate |
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