



Maths
Schema Progression Document
Cycle A

	Early Years	Key Stage One	Lower Key Stage Two	Upper Key Stage Two
Number: Place Value - Counting	Count beyond 20, recognising the pattern of the counting system.	Count to and across 100, forwards and backwards. Count in steps of 2, 3, 5 and 10, forward and backward.	Count in multiples of 4, 6, 7, 8, 9, 25, 50, 100 and 1,000. Find 10 or 100 more or less than a given number. Count backwards through zero.	Count forwards and backwards in steps of powers of 10. Count forwards and backwards with positive and negative whole numbers.
Number: Place Value – Represent	Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.	Read and write numbers to at least 100 in numerals and words. Use different representations to identify, represent and estimate numbers.	Read and write numbers up 1,000 in numerals and words. Read Roman numerals to 100 (I to C).	Read, write, (order and compare) numbers up to 10,000,000 and determine the value of each digit. Read Roman numerals to 1,000 (M) and recognise years written in Roman numerals.
Number: Place Value – Compare	Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity.	Find one more or less than a given number. Recognise the place value of each digit in a two-digit number. Compare and order numbers from 0 to 100. Use <, > and = signs.	Find 1,000 more or less than a given number. Recognise the place value of each digit in a four-digit number. Order and compare numbers beyond 1,000.	(Read, write), order and compare numbers up to 10,000,000 and determine the value of each digit.
Number: Place Value – Problems & Rounding		Use place value and number facts to solve problems.	Round any number to the nearest 10, 100 or 1,000. Solve number and practical problems with increasingly larger numbers.	Interpret negative numbers in context and calculate intervals across zero. Round any whole number to a required degree of accuracy.



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<p>Number: Addition & Subtraction – Recall, Represent & Use</p>	<p>Have a deep understanding of number to 10, including the composition of each number.</p> <p>Recall number bonds up to 5 and some number bonds to 10, including double facts.</p>	<p>Recall and use addition and subtraction facts to 20 fluently and derive and use related facts up to 100.</p> <p>Recognise and use the inverse relationship between addition and subtraction and use to check calculations and solve missing number problems.</p>	<p>Estimate and use inverse operations to check answers to a calculation.</p>	<p>Use rounding to check answers to calculations and determine levels of accuracy.</p>
<p>Number: Addition & Subtraction - Calculations</p>		<p>Add and subtract numbers using concrete objects, pictorial representations and mentally, including:</p> <ul style="list-style-type: none"> - A two-digit number and ones - A two-digit number and tens - Two two-digit numbers - Adding three one-digit numbers 	<p>Add and subtract mentally numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate.</p>	<p>Perform mental calculations, including with mixed operations and large numbers.</p> <p>Use their knowledge of the order of operations to carry out calculations involving the four operations.</p>
<p>Number: Addition & Subtraction – Solve Problems</p>		<p>Solve problems with addition and subtraction:</p> <ul style="list-style-type: none"> - Using concrete objects and pictorial representations - Applying their knowledge of mental and written methods 	<p>Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why.</p>	<p>Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.</p>
<p>Number: Multiplication & Division – Recall, Represent & Use</p>		<p>Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers.</p>	<p>Recall multiplication and division facts for multiplication tables up to 12x12.</p> <p>Use place value and derived facts to multiply and divide mentally, including:</p> <ul style="list-style-type: none"> - Multiplying by 0 and 1 - Dividing by 1 - Multiplying together three numbers 	<p>Identify common factors, common multiples and prime numbers.</p> <p>Recognise and use square numbers and cube numbers.</p> <p>Use estimation to check answers to calculations and determine an approximate level of accuracy.</p>



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			Recognise and use factor pairs and commutativity in mental calculations.	
Number: Multiplication & Division – Calculations		Calculate mathematical statements for multiplication and division within the multiplication tables and write them using \times , \div and $=$ signs.	Multiply two-digit and three-digit numbers by a one-digit number using a formal written layout.	Multiply and divide multi-digit numbers up to 4 digits by a two-digit whole number using the formal written methods of long multiplication, long division and short division, interpreting remainders as whole numbers or rounding as appropriate. Perform mental calculations, including mixed operations and large numbers.
Number: Multiplication & Division – Solve Problems		Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods and multiplication and division facts, including problems in context.	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.	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.
Number: Fractions – Read & Write		Recognise, find, name and write fractions $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ of a length, shape, set of objects or quantity.	Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators. Count up and down in hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten.	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.



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<p>Number: Fractions – Compare</p>		<p>Recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$.</p>	<p>Recognise and show, using diagrams, families of common equivalent fractions.</p>	<p>Use common factors to simplify fractions; use common multiples to express fractions in the same denomination.</p> <p>Compare and order fractions, including fractions >1.</p>
<p>Number: Fractions – Calculations</p>		<p>Write simple fractions eg., $\frac{1}{2}$ of 6 = 3</p>	<p>Add and subtract fractions with the same denominator.</p>	<p>Add and subtract fractions with different denominators and mixed numbers using the concept of equivalent fractions.</p> <p>Multiply simple pairs of proper fractions, writing the answer in its simplest form.</p> <p>Divide proper fractions by whole numbers.</p>
<p>Number: Decimals – Recognise & Write</p>			<p>Recognise and write decimal equivalents of any number of tenths or hundredths and $\frac{1}{4}$, $\frac{1}{2}$ and $\frac{3}{4}$.</p>	<p>Read and write decimal numbers as fractions.</p> <p>Identify the value of each digit in numbers given to three decimal places.</p>
<p>Number: Decimals – Compare</p>			<p>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.</p>	<p>Round decimals with two decimal places to the nearest whole number and to one decimal place.</p> <p>Read, write, order and compare numbers with three decimal places.</p>



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Number: Decimals – Calculations & Problems			Find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of digits.	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.
Number: Fractions, Decimals & Percentages			Solve simple measure and money problems involving fractions and decimals to two decimal places.	Associate fraction with division and calculate decimal fraction equivalents. Recall and use equivalences between simple fractions, decimals and percentages, including different contexts.
Number: Ratio & Proportion				Solve problems involving: <ul style="list-style-type: none">- The relative sizes of two quantities where missing values can be found using integer multiplication and division facts.- The calculation of percentages and use of percentages for comparison- Similar shapes where the scale factor is known- Unequal sharing and grouping using knowledge of fractions and multiples



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<p>Number: Algebra</p>		<p>Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number questions.</p>	<p>Solve problems including missing number problems.</p>	<p>Use simple formulae. Generate and describe linear number sequences.</p> <p>Express missing number problems algebraically. Find pairs of numbers that satisfy an equation with two unknowns.</p> <p>Enumerate possibilities of combinations of two variables.</p>
<p>Measurement: Using Measures</p>		<p>Choose and use appropriate standard units and measure length/height in any direction (m/cm); mass (kg/g); temperature (°C); capacity (litres/ml) to the nearest unit, using rulers, scales, thermometers and measuring vessels.</p> <p>Compare and order lengths, mass, volume/capacity and record the results using >, < and =.</p>	<p>Convert between different units of measure.</p> <p>Estimate, compare and calculate different masses.</p>	<p>Solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate.</p> <p>Use, read, write and convert between standard units, converting measurements of length, mass, volume and time from smaller unit of measure to a larger unit and vice versa.</p> <p>Convert between miles and kilometres.</p>
<p>Measurement: Money</p>		<p>Recognise and use symbols for pounds and pence; combine amounts to make a particular value.</p> <p>Find different combinations of coins that equal the same amount.</p>	<p>Estimate, compare and calculate different measures, including money in pounds and pence.</p>	<p>Use all four operations to solve problems involving measure.</p>



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		Solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change.		
Measurement: Time		<p>Compare and sequence intervals of time.</p> <p>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.</p> <p>Know the number of minutes in an hour and the number of hours in a day.</p>	<p>Read, write and convert time between an analogue clock (including using Roman numerals) and 12-hour and 24-hour clocks.</p> <p>Solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days.</p> <p>Compare durations of events.</p>	<p>Use, read, write and convert between standard units, converting measurements of time from a smaller unit of measure to a larger unit and vice versa.</p>
Measurement: Perimeter, Area & Volume			<p>Measure and calculate the perimeter of a rectilinear figure in centimetres and metres.</p> <p>Find the area of rectilinear shapes by counting squares.</p>	<p>Measure and calculate the perimeter of composite rectilinear shapes.</p> <p>Recognise that shapes with the same areas can have different perimeters and vice versa.</p> <p>Recognise when it is possible to use formulae for area and volume of shapes.</p> <p>Calculate the area of triangles and parallelograms.</p>



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				Calculate, estimate and compare volume of cubes and cuboids using standard units.
Geometry: 2-D Shapes		<p>Identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line.</p> <p>Identify 2-D shapes on the surface of 3-D shapes.</p> <p>Compare and sort common 2-D shapes and everyday objects.</p>	<p>Draw 2-D shapes.</p> <p>Compare and classify geometric shapes, including quadrilaterals and triangles based on their properties and sizes.</p> <p>Identify lines of symmetry in 2-D shapes presented in different orientations.</p>	<p>Draw 2-D shapes using given dimensions.</p> <p>Distinguish between regular and irregular polygons.</p> <p>Illustrate and name parts of circles (including radius, diameter and circumference and know the circumference is twice the radius).</p>
Geometry: 3-D Shapes		<p>Recognise and name common 3-D shapes.</p> <p>Compare and sort common 3-D shapes and everyday objects.</p>	<p>Make 3-D shapes using modelling materials.</p> <p>Recognise 3-D shapes in different orientations and describe them.</p>	<p>Recognise, describe and build simple 3-D shapes, including making nets.</p>
Geometry: Angles & Lines			<p>Recognise angles as a property of a shape or a description of a turn.</p> <p>Identify right, acute and obtuse angles and compare and order angles up to two right angles by size.</p> <p>Identify lines of symmetry in 2-D shapes presented in different orientations.</p>	<p>Know angles are measured in degrees.</p> <p>Draw given angles.</p> <p>Find unknown angles in any triangles, quadrilaterals and regular polygons.</p> <p>Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles.</p>



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			Complete a simple symmetric figure with respect to a specific line of symmetry.	
Geometry: Position & Direction		Use mathematical vocabulary to describe position, direction and movement, including movement in a straight line and distinguishing between rotation in a turn and in terms of right angles. Order and arrange combinations of mathematical objects in patterns and sequences.	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 selected points and draw sides to complete a given polygon.	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.
Statistics: Present & Interpret		Interpret and construct simple pictograms, tally charts, block diagrams and simple tables.	Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs.	Interpret and construct tables, pie charts and line graphs and use these to solve problems.
Statistics: Solve Problems		Ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity. Total and compare categorical data.	Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and graphs.	Solve comparison, sum and difference problems using information presented in a line graph. Calculate the mean as an average.