



Christleton Primary School

Maths

## Year 6 – Mathematics Intent

### Year 6 Maths Long Term Plan

Autumn	Number and Place Value (3 weeks)	Addition and Subtraction (2 weeks)	Multiplication and Division (4 weeks)	Fractions (6 weeks)	
Spring	Decimals and Percentages (4 weeks)	Ratio and Proportion (2 weeks)	Measure (3 weeks)	Geometry - Shape, Position and Direction (4 weeks)	Statistics (1 week)
Summer	Algebra (1 week)	Revision (4 weeks)	SATs Week	Number, Algebra, Geometry and Substantial Problem Solving (8 weeks)	

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Block 1			
Number and Place Value			
Substantive Knowledge  National Curriculum	Ready to Progress	Key Performance Indicators	Sequence of learning Detailed in Planning Overview
Read, write, order and compare numbers up to 10 000 000 and determine the value of each digit	<p>NPV-1 Understand the relationship between powers of 10 from 1 hundredth to 10 million, and use this to make a given number 10, 100, 1,000, 1 tenth, 1 hundredth or 1 thousandth times the size (multiply and divide by 10, 100 and 1,000).</p> <p>NPV-2 Recognise the place value of each digit in numbers up to 10 million, including decimal fractions, and compose and decompose numbers up to 10 million using standard and non-standard partitioning.</p>	<ul style="list-style-type: none"> <li>Can explain the place value in numbers up to 10 000 000</li> <li>Can order a set of numbers to 10 000 000</li> <li>Understands how a number can be partitioned into different amounts</li> <li>Can multiply and divide numbers by 10 and 1000 and explain the effect on the size of the digits in the number</li> </ul>	<p>*Numbers to ten million</p> <p>*Understanding and counting in</p> <p>*Powers of 10</p> <p>*Partitioning in standard and non-standard ways</p> <p>*Compare and order numbers</p> <p>*Ordering on a number line</p>
Round any whole number to a required degree of accuracy	<p>NPV-3 Reason about the location of any number up to 10 million, including decimal fractions, in the linear number system, and round numbers, as appropriate, including in contexts.</p> <p>NPV-4 Divide powers of 10, from 1 hundredth to 10 million, into 2, 4, 5 and 10 equal parts, and read scales/number lines with labelled intervals divided into 2, 4, 5 and 10 equal parts.</p>	<ul style="list-style-type: none"> <li>Can round numbers to the nearest 1 000 000</li> <li>Can estimate the answers to calculations by rounding and comparing answers</li> </ul>	<p>*Round numbers</p> <p>*Negative Numbers</p> <p>*Calculate intervals between negative and positive numbers</p> <p>*Solve problems using Place Value</p> <p>*Additional Challenge</p>
Use negative numbers in context, and calculate intervals across zero		<ul style="list-style-type: none"> <li>Can solve problems involving negative numbers linked to temperature, money and measures <i>e.g. find the difference between two temperatures when one is negative.</i></li> </ul>	<p>Investigating how the number system works</p>
Solve number and practical problems that involve all of the above.		<ul style="list-style-type: none"> <li>Can solve problems involving place value, including word problems and problems linked to population of countries, money and measure</li> </ul>	<p>*Application to SATs questions embedded into each unit of work at the appropriate stage of an objective</p>

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Block 2			
Addition and Subtraction			
Substantive Knowledge  National Curriculum	Ready to Progress	Key Performance Indicators	Sequence of learning Detailed in Planning Overview
Perform mental calculations, including with mixed operations and large numbers	<p>6AS/MD-1 Understand that 2 numbers can be related additively or multiplicatively, and quantify additive and multiplicative relationships (multiplicative relationships restricted to multiplication by a whole number).</p> <p>6AS/MD-2 Use a given additive or multiplicative calculation to derive or complete a related calculation, using arithmetic properties, inverse relationships, and place-value understanding.</p>	<ul style="list-style-type: none"> <li>Can mentally add and subtract numbers including decimals using a variety of strategies</li> </ul>	<ul style="list-style-type: none"> <li>*Assess mental and written strategies that children have retained throughout KS2</li> <li>*Recap/consolidate mental strategies for addition and subtraction</li> <li>*BODMAS</li> <li>*Recap on</li> <li>*Recap/consolidate written strategies for addition and subtraction</li> <li>*Two Step Problems</li> <li>*Application to SATs questions embedded into each unit of work at the appropriate stage of an objective</li> </ul>
Use their knowledge of the order of operations to carry out calculations involving the four operations		<ul style="list-style-type: none"> <li>Can understand and use brackets</li> <li>Can understand the order of operations, BODMAS</li> </ul>	
Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why		<ul style="list-style-type: none"> <li>Can use addition and/or subtraction strategies to solve a complex problem.</li> <li>Solve problems including those with more than one step</li> </ul>	
Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy		<ul style="list-style-type: none"> <li>Can use rounding to estimate the answer</li> <li>Can use estimating to consider whether their answer is appropriate</li> <li>Can use the inverse to check the answer</li> </ul>	

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Block 3			
Multiplication and Division			
Substantive Knowledge  National Curriculum	Ready to Progress	Key Performance Indicators	Sequence of learning Detailed in Planning Overview
Perform mental calculations, including with mixed operations and large numbers	<p>AS/MD-1 Understand that 2 numbers can be related additively or multiplicatively, and quantify additive and multiplicative relationships (multiplicative relationships restricted to multiplication by a whole number)</p> <p>6AS/MD-2 Use a given additive or multiplicative calculation to derive or complete a related calculation, using arithmetic properties, inverse relationships, and place-value understanding.</p>	<ul style="list-style-type: none"> <li>Can decide when to use a mental method, informal jottings or a written method for calculations with all four operations</li> <li>Can identify an appropriate strategy to solve a mental calculation e.g. calculate <math>24 \times 15</math>, they multiply <math>24 \times 10</math> and then halve this to get <math>24 \times 5</math>, adding these two results together.</li> <li>Can approximate effectively using rounding</li> <li>Can derive facts involving decimals</li> <li>Can use knowledge of square numbers to derive square of multiples of 10 e.g. <math>60 \times 60</math></li> </ul>	<p>*Assess mental and written strategies that children have retained throughout KS2</p> <p>*Recap/consolidate mental methods for multiplication and division</p> <p>*Multiples, Common multiples and Factors</p> <p>*Prime Numbers</p> <p>*Square and Cube numbers</p> <p>*Recap/consolidate written methods for multiplication</p> <p>*Recap/consolidate written methods for division by a 1-digit number</p> <p>*Long division</p> <p>*BODMAS/ BIDMAS</p> <p>*Solve multi step problems using multiplication and division</p> <p>*Solve multi step problems using 4 operations</p> <p>*Application to SATs questions embedded into each unit of work at the appropriate stage of an objective</p>
Identify common factors, common multiples and prime numbers		<ul style="list-style-type: none"> <li>Can identify common factors of 2 digit numbers</li> <li>Can identify common multiples of 2 digit numbers</li> <li>Can identify prime numbers to 100 and begin to recall these</li> </ul>	
Use their knowledge of the order of operations to carry out calculations involving the four operations		<ul style="list-style-type: none"> <li>Can understand the order of BODMAS and use this to solve calculations</li> </ul>	
Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication		<ul style="list-style-type: none"> <li>Can use mental strategies to approximate answers to multiplication and division calculations</li> <li>Can use an appropriate formal written method to multiply numbers up to ThHTU by TU</li> </ul>	
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		<ul style="list-style-type: none"> <li>Can use an expanded written method to divide ThHTU by TU</li> <li>Can use a standard written method of long division to divide ThHTU by TU</li> <li>Can interpret remainders accurately</li> </ul>	

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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		<ul style="list-style-type: none"> <li>• Can use a standard written method of short division to divide ThHTU by U</li> <li>• Can use a standard written method of short division to divide ThHTU by TU</li> <li>• Can interpret remainders accurately</li> </ul>	
Solve problems involving addition, subtraction, multiplication and division		<ul style="list-style-type: none"> <li>• Can use addition and/or subtraction strategies to solve a complex problem.</li> <li>• Solve problems including those with more than one step</li> </ul>	
Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.		<ul style="list-style-type: none"> <li>• Can use rounding to estimate the answer</li> <li>• Can use estimating to consider whether their answer is appropriate</li> <li>• Can use the inverse to check the answer</li> </ul>	

Block 4			
Fractions			
Substantive Knowledge  National Curriculum	Ready to Progress	Key Performance Indicators	Sequence of learning Detailed in Planning Overview
Use common factors to simplify fractions; use common multiples to express fractions in the same denomination	F-1 Recognise when fractions can be simplified, and use common factors to simplify fractions.	<ul style="list-style-type: none"> <li>• Understand equivalent fractions have common multiples</li> <li>• Using diagrams can see fractions are the same when simplified.</li> <li>• Can simplify fractions by dividing the numerator and denominator by a common factor.</li> </ul>	<ul style="list-style-type: none"> <li>*Compare and order fractions</li> <li>*Equivalent fractions</li> <li>*Mixed and Improper fractions</li> <li>*Compare and order fractions denominators are multiples of the same number</li> <li>*Add fractions</li> <li>*Subtract fractions</li> <li>*Multiply fractions by whole numbers</li> <li>*Multiplying pairs of proper fractions</li> <li>*Dividing fractions</li> </ul>
Compare and order fractions, including fractions $> 1$	<p>F-2 Express fractions in a common denomination and use this to compare fractions that are similar in value.</p> <p>F-3 Compare fractions with different denominators, including fractions greater than 1, using reasoning, and choose between reasoning and common denomination as a comparison strategy</p>	<ul style="list-style-type: none"> <li>• Can convert fractions into common denominators</li> <li>• Can use decimal equivalence to order and compare fractions.</li> </ul>	
Add and subtract fractions with different denominators		<ul style="list-style-type: none"> <li>• Can use knowledge of equivalent fractions to add fractions</li> <li>• Can convert mixed numbers into improper fractions.</li> </ul>	



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and mixed numbers, using the concept of equivalent fractions			*Application to SATs questions embedded into each unit of work at the appropriate stage of an objective
Multiply simple pairs of proper fractions, writing the answer in its simplest form		<ul style="list-style-type: none"> <li>Understand when multiplying by a fraction the answer will be smaller.</li> <li>Using diagrams can understand when multiplying fractions by a fraction the answer will be smaller.</li> <li>Can follow a standard method to multiply fractions.</li> </ul>	
Divide proper fractions by whole numbers		<ul style="list-style-type: none"> <li>Can divide a proper fraction by a whole number</li> <li>Can explain how to divide a proper fraction, using diagrams if necessary to show understanding</li> </ul>	
Associate a fraction with division and calculate decimal fraction equivalents		<ul style="list-style-type: none"> <li>Understand how to calculate a decimal from a fraction by dividing the numerator by the denominator.</li> <li>Can explore recurring equivalence of decimals and fractions.</li> <li>Can recall common fraction and decimal equivalents</li> </ul>	

Block 5			
Decimals and Percentages			
Substantive Knowledge  National Curriculum	Ready to Progress	Key Performance Indicators	Sequence of learning Detailed in Planning Overview
Identify the value of each digit in numbers given to three decimal places and multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places	<p>NPV-1 Understand the relationship between powers of 10 from 1 hundredth to 10 million, and use this to make a given number 10, 100, 1,000, 1 tenth, 1 hundredth or 1 thousandth times the size (multiply and divide by 10, 100 and 1,000).</p> <p>NPV-2 Recognise the place value of each digit in numbers up to 10 million, including decimal fractions, and compose and decompose numbers up to 10 million using standard and non-standard partitioning.</p> <p>NPV-4 Divide powers of 10, from 1 hundredth to 10 million, into 2, 4, 5 and 10 equal parts, and read scales/number lines with labelled intervals divided into 2, 4, 5 and 10 equal parts.</p>	<ul style="list-style-type: none"> <li>Understands the effect of multiplying a decimal by 10, 100 and 100</li> <li>Understands the effect of dividing a decimal by 10, 100 and 100</li> </ul>	<ul style="list-style-type: none"> <li>*Understanding thousandths</li> <li>*x 10, 100</li> <li>*Ordering a range of decimals</li> <li>*Rounding decimals</li> <li>*Link Decimals to fractions</li> <li>*Link decimals to calculation</li> <li>*Link decimals to measure</li> <li>*Solve problems linked to measure</li> <li>*Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts</li> <li>*Exploring percentages</li> <li>*Link finding percentages to measure</li> </ul>

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Multiply one-digit numbers with up to two decimal places by whole numbers		<ul style="list-style-type: none"> <li>Can use an appropriate formal written method to multiply numbers up to U.th by U</li> <li>Can use mental strategies to approximate answers to multiplication calculations</li> <li>Can say why an answer to a multiplication involving 2 decimal places cannot be correct <i>e.g. Sam says the answer to <math>2.34 \times 4</math> is 93.6 Explain why he cannot be correct.</i></li> </ul>	<p>*Solve a range of multi-step word problems using decimals</p> <p>*Application to SATs questions embedded into each unit of work at the appropriate stage of an objective</p>
Use written division methods in cases where the answer has up to two decimal places		<ul style="list-style-type: none"> <li>Can use an appropriate formal method to divide a number with U.th by a single digit <i>e.g. in the context of money <math>\pounds 4.35 \div 3</math></i></li> <li>Can use an appropriate formal method to divide a whole number with a remainder by a single digit, extending their working into decimal places <i>e.g. <math>\pounds 178 \div 8</math></i></li> <li>Can interpret decimal answers in context <i>e.g. What does 5.6 represent if it is in the context of money? mass? length?</i></li> </ul>	
Solve problems which require answers to be rounded to specified degrees of accuracy	NPV-3 Reason about the location of any number up to 10 million, including decimal fractions, in the linear number system, and round numbers, as appropriate, including in contexts.	<ul style="list-style-type: none"> <li>Can choose and use appropriate methods of calculation using all four operations.</li> <li>Can decide whether to round an answer to the nearest tenth, whole number or higher value place, in context <i>e.g. Approximately how many metres of fabric should I buy if I need to make 3 dresses which each use 1.34m?</i></li> <li>Can use rounding to estimate the answer</li> <li>Can consider whether their answer is appropriate</li> </ul>	
Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts	NPV-4 Divide powers of 10, from 1 hundredth to 10 million, into 2, 4, 5 and 10 equal parts, and read scales/number lines with labelled intervals divided into 2, 4, 5 and 10 equal parts.	<ul style="list-style-type: none"> <li>Can recognise simple fraction, decimal and percentage equivalences in context including <math>\frac{1}{2} = 0.5</math>, <math>\frac{1}{4} = 0.25</math>, <math>\frac{3}{4} = 0.75</math>, <math>\frac{1}{10} = 0.1</math>, <math>\frac{1}{5} = 0.2</math></li> <li>Can recognise other equivalent fractions, decimals and percentages with the same denominator <i>e.g. If <math>\frac{1}{10} = 0.1</math>, <math>\frac{3}{10} = ?</math></i></li> <li>Can explain why <math>\frac{6}{10}</math> is more than 50%</li> </ul>	



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Block 6			
Ratio and Proportion			
Substantive Knowledge	Ready to Progress	Key Performance Indicators	Sequence of learning Detailed in Planning Overview
<b>National Curriculum</b>			
Solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts	<p>AS/MD-1 Understand that 2 numbers can be related additively or multiplicatively, and quantify additive and multiplicative relationships (multiplicative relationships restricted to multiplication by a whole number).</p> <p>AS/MD-3 Solve problems involving ratio relationships.</p>	<ul style="list-style-type: none"> <li>Understands ratio as a comparison of one part or amount with another</li> <li>Can confidently use the language of 'for every' when describing a ratio.</li> <li>Can use ratio to show the relative size of two quantities</li> </ul>	<p>*Solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts</p> <p>*Solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison</p>
Solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison		<ul style="list-style-type: none"> <li>Understands proportion as a fraction of the whole amount</li> <li>Can use percentages equivalents to describe a proportion</li> </ul>	<p>*Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples</p>
Solve problems involving similar shapes where the scale factor is known or can be found		<ul style="list-style-type: none"> <li>Understands direct proportion by scaling quantities up and down</li> <li>Understands ratio as additive change or a multiplicative change</li> <li>Can scale up/down recipes for a given number.</li> </ul>	<p>*Solve problems involving similar shapes where the scale factor is known or can be found</p>
Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples.		<ul style="list-style-type: none"> <li>Can investigate possible answers to a question where one fraction has an impact on the other.</li> </ul>	<p>*Application to SATs questions embedded into each unit of work at the appropriate stage of an objective</p>

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Block 7			
Measure			
Substantive Knowledge  National Curriculum	Ready to Progress	Key Performance Indicators	Sequence of learning Detailed in Planning Overview
Solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate	NPV-1 Understand the relationship between powers of 10 from 1 hundredth to 10 million, and use this to make a given number 10, 100, 1,000, 1 tenth, 1 hundredth or 1 thousandth times the size (multiply and divide by 10, 100 and 1,000).	<ul style="list-style-type: none"> <li>Can recall approximate conversions and is able to tell if an answer is sensible.</li> <li>Can use decimal notation in a variety of formats to solve a problem.</li> </ul>	<ul style="list-style-type: none"> <li>*Establish common conversions of measure e.g. 1000ml = litre</li> <li>*Examine the relationship between a whole litre and a tenth of a litre. Continue to 3d.p.</li> <li>*Represent the conversions of measure on a numberline showing the relationship between a whole litre/ km/kg and the tenths/hundredths and thousandths of a measure.</li> </ul>
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 to up to three decimal places	<p>NPV-2 Recognise the place value of each digit in numbers up to 10 million, including decimal fractions, and compose and decompose numbers up to 10 million using standard and non-standard partitioning.</p> <p>NPV-3 Reason about the location of any number up to 10 million, including decimal fractions, in the linear number system, and round numbers, as appropriate, including in contexts.</p> <p>NPV-4 Divide powers of 10, from 1 hundredth to 10 million, into 2, 4, 5 and 10 equal parts, and read scales/number lines with labelled intervals divided into 2, 4, 5 and 10 equal parts.</p>	<ul style="list-style-type: none"> <li>Can explain the relationship between conversions</li> <li>Can make estimates based on approximate conversions.               <ul style="list-style-type: none"> <li>1 litre is approximately 2 pints (more accurately, <math>1\frac{3}{4}</math> pints)</li> <li>4.5 litres is approximately 1 gallon or 8 pints</li> <li>1 kilogram is approximately 2 lb (more accurately, 2.2 lb)</li> <li>30 grams is approximately 1 oz</li> <li>8 kilometres is approximately 5 miles</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>*Solve problems involving conversion of measure from larger to smaller and smaller to larger.</li> <li>*Consider the conversion of time.</li> <li>*Recap on perimeters of a shape.</li> <li>*Find perimeters of regular and irregular shapes. Including conversion of measure in the perimeters.</li> <li>*Find missing values of a perimeter of a shape.</li> <li>*Recap on how to find the area of a shape.</li> <li>*Find areas of rectangles and compound shapes. Including conversion of measure.</li> <li>*Find missing lengths of a shape if given the area.</li> <li>*Calculate the area of parallelograms</li> <li>*Calculate the area of triangles</li> <li>*Find missing lengths of a shape if given the area.</li> <li>*Recap on how to find the volume of a shape.</li> </ul>
Convert between miles and kilometres		<ul style="list-style-type: none"> <li>Can use the conversion of miles to Km to apply to other facts.</li> </ul>	<ul style="list-style-type: none"> <li>*Find volumes of regular shapes.</li> <li>*Find volumes of irregular shapes. Including conversion of measure.</li> </ul>
Recognise that shapes with the same areas can have different perimeters and vice versa		<ul style="list-style-type: none"> <li>Can measure and calculate the perimeter and area of composite rectilinear shapes</li> <li>Can calculate the perimeters of compound shapes that can be split into rectangles.</li> <li>Can identify shapes that have the same area but have different perimeters</li> </ul>	<ul style="list-style-type: none"> <li>*Find missing values of a shape if given the volume.</li> <li>*Application to SATs questions embedded into each unit of work at the appropriate stage of an objective</li> </ul>

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Recognise when it is possible to use formulae for area and volume of shapes		<ul style="list-style-type: none"> <li>Understands when to use a formula to find the area of a shape.</li> <li>Understands when to use the formula to find the volume of a shape.</li> </ul>	
Calculate the area of parallelograms and triangles		<ul style="list-style-type: none"> <li>Can calculate the area of right-angled triangles using their knowledge of a square</li> <li>Can generalise how to find the area of a triangle</li> <li>Can calculate the area of a parallelogram using their knowledge of squares and triangles.</li> </ul>	
Calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm <sup>3</sup> ) and cubic metres (m <sup>3</sup> ), and extending to other units [for example, mm <sup>3</sup> and km <sup>3</sup> ].		<ul style="list-style-type: none"> <li>Can find volumes of regular and irregular 3D shapes using cubes.</li> <li>Can estimate and compare volumes.</li> <li>Can calculate volume using the formula length x width x height</li> <li>Can record volume using cubic units (cm<sup>3</sup>, m<sup>3</sup>, mm<sup>3</sup> and km<sup>3</sup>)</li> </ul>	

Block 8			
Geometry - Shape and Position and Direction			
Substantive Knowledge National Curriculum	Ready to Progress	Key Performance Indicators	Sequence of learning Detailed in Planning Overview
Draw 2-D shapes using given dimensions and angles	G-1 Draw, compose, and decompose shapes according to given properties, including dimensions, angles and area, and solve related problems.	<ul style="list-style-type: none"> <li>Can identify, visualise and describe properties of rectangles, triangles and regular polygons</li> <li>Can use knowledge of properties to draw 2-D shapes</li> <li>Can use a ruler to measure accurately within 1mm</li> <li>Can use a ruler to draw lines accurately within 2mm</li> <li>Can use a protractor to measure angles accurately within 1 degree</li> <li>Can use a protractor to draw angles accurately within 2 degrees</li> <li>Can construct a triangle given two sides and the included angle</li> </ul>	<ul style="list-style-type: none"> <li>*Compare and classify geometric shapes based on their properties and sizes</li> <li>*Draw 2-D shapes using given dimensions and angles</li> <li>*Find unknown angles in any triangles, quadrilaterals and regular polygons</li> </ul>

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Recognise, describe and build simple 3-D shapes, including making nets		<ul style="list-style-type: none"> <li>Identify, visualise and describe properties of 3-D solids</li> <li>Identify 3D shapes from their nets and explain why, including open and closed cubes</li> <li>Draw nets of 3-D shapes with given dimensions</li> </ul>	*Recognise, describe and build simple 3-D shapes, including making nets
Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons		<ul style="list-style-type: none"> <li>Can recognise the properties of isosceles, right angled, equilateral and scalene triangles</li> <li>Can recognise the properties of squares, rectangles, rhombuses, parallelograms, trapeziums and kites</li> <li>Can explain why a polygon is regular or irregular</li> <li>Can identify whether a triangle is isosceles from known angles and sides</li> <li>Can find unknown angles in all triangles, given one angle</li> </ul>	*Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius *Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles
Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius		<ul style="list-style-type: none"> <li>Can recognise that the circumference is the distance around a circle</li> <li>Can explain that the radius is the distance from the centre to the circumference</li> <li>Can explain that the diameter is 2x the radius</li> <li>Can use the formula <math>C=\pi d</math> to work out the circumference of a circle</li> </ul>	*Describe vertices of a shape on a full coordinates grid. *Translate a shape and describe the new position on the coordinates grid.
Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles.		<ul style="list-style-type: none"> <li>Can estimate angles</li> <li>Can use a protractor to measure and draw angles on their own and in shapes</li> </ul> Can explain that: <ul style="list-style-type: none"> <li>the angle sum of a triangle is <math>180^\circ</math></li> <li>the angles on a straight line add to <math>180^\circ</math></li> <li>the sum of angles around a point is <math>360^\circ</math></li> <li>Can recognise vertically opposite angles and know that they are equal</li> <li>Can find missing angles in a variety of contexts</li> </ul>	*Reflect a shape and describe the new position on the coordinates grid. *Application to SATs questions embedded into each unit of work at the appropriate stage of an objective
Describe positions on the full coordinate grid (all four quadrants)		<ul style="list-style-type: none"> <li>Can draw an axis for the four quadrants with equal spacing and negative numbers.</li> <li>Can describe the vertices of a shape in all four quadrants</li> <li>Can use the properties of a shape to complete the vertices of the shape.</li> </ul>	
Draw and translate simple shapes on the coordinate plane, and reflect them in the axes.		<ul style="list-style-type: none"> <li>Can draw a shape after a reflection of a simple shape in two mirror lines.</li> <li>Can draw a shape after a shape has been translated across the four quadrants.</li> </ul>	

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Block 9			
Statistics			
Substantive Knowledge National Curriculum	Ready to Progress	Key Performance Indicators	Sequence of learning Detailed in Planning Overview
Interpret and construct pie charts and line graphs and use these to solve problems	NPV-4 Divide powers of 10, from 1 hundredth to 10 million, into 2, 4, 5 and 10 equal parts, and read scales/number lines with labelled intervals divided into 2, 4, 5 and 10 equal parts.	<ul style="list-style-type: none"> <li>• Can use knowledge of fractions and percentages to interpret pie charts</li> <li>• Can construct a simple pie chart using common fractions</li> <li>• Can interpret a line graph when the answer lies between two given intervals</li> <li>• Can interpret a line graph that represents a conversion e.g. miles/kilometres</li> </ul>	<p>Assess children's knowledge of Bar chart, line graphs and tables.</p> <p>Construct line graphs that represent a relationship between the two axis</p> <p>Complete line graphs based on given information.</p> <p>Interpret line graphs where the answer is on a given point</p>
Calculate and interpret the mean as an average.		<ul style="list-style-type: none"> <li>• Can calculate the mean of a set of numbers</li> <li>• Understands that the mean is an average and understands when it is appropriate to find the mean of a set of data</li> </ul>	<p>Interpret line graphs where the answer lies between given points.</p> <p>Construct simple pie charts using common fractions</p> <p>Use knowledge of common fractions and percentages to construct pie charts</p> <p>Interpret pie charts using common fractions and percentages</p> <p>Calculate the mean of a set of numbers</p> <p>Consider when it is appropriate to calculate the mean of a set of numbers.</p> <p>*Application to SATs questions embedded into each unit of work at the appropriate stage of an objective</p>

## Year 6 – Mathematics Intent

Block 10			
Algebra			
Substantive Knowledge National Curriculum	Ready to Progress	Key Performance Indicators	Sequence of learning Detailed in Planning Overview
Use simple formulae	AS/MD-1 Use a given additive or multiplicative calculation to derive or complete a related calculation, using arithmetic properties, inverse relationships, and place-value understanding.	<ul style="list-style-type: none"> <li>Understands that a value can be replaced by a number or a symbol</li> <li>Can solve missing box calculations by using inverse.</li> <li>Can use formulae for other areas of learning e.g. perimeter and measure</li> <li>Can substitute values into a formula to find an answer.</li> <li>Can show a good understanding of the equals sign as a balancing symbol</li> </ul>	<ul style="list-style-type: none"> <li>*Use simple formulae</li> <li>*Express missing number problems algebraically</li> <li>*Generate and describe linear number sequences</li> <li>*Find pairs of numbers that satisfy an equation with two unknowns</li> </ul>
Generate and describe linear number sequences		<ul style="list-style-type: none"> <li>Can create a number sequence given a rule to follow.</li> <li>Understands a linear equation can be recursive, i.e. one number in the sequence is generated from the preceding number e.g. by adding 3 to the preceding number</li> <li>Understands a linear equation can be ordinal, i.e. the position of the number in the sequence generates the number e.g. by multiplying the position by 3, and then subtracting 2</li> </ul>	<ul style="list-style-type: none"> <li>*Enumerate possibilities of combinations of two variables</li> </ul>
Express missing number problems algebraically		<ul style="list-style-type: none"> <li>Can use symbols to express missing number problems</li> <li>Can find values that satisfy the equation and make it a true statement.</li> <li>Understands the associative law and can apply it to missing number problems</li> <li>Understands the distributive law and can apply it to missing number problems</li> </ul>	<ul style="list-style-type: none"> <li>*Application to SATs questions embedded into each unit of work at the appropriate stage of an objective</li> </ul>
Find pairs of numbers that satisfy an equation with two unknowns	AS/MD-4 Solve problems with 2 unknowns.	<ul style="list-style-type: none"> <li>Can substitute numbers into unknowns to find a given value where there are limited answers.</li> </ul>	
Enumerate possibilities of combinations of two variables		<ul style="list-style-type: none"> <li>Can identify different variables and consider the impact on one when one changes e.g. list all the combinations of boys and girls in a class where there are twice as many boys as girls and between 25 &amp; 35 children in the class altogether.</li> </ul>	



## Year 6 – Mathematics Intent

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### Block 11

#### Number, Geometry and Substantial Problem Solving

Following on from National Assessments in May, teachers will assess children's understanding against all Ready to Progress statements and plan to cover any areas that need further consolidation.

Additional projects will be explored to allow the children to explore the purpose of mathematics through open-ended investigations.

Theme Park Maths, Can the Commonwealth Games/Olympics/World Championships/FIFA World Cup/Rugby World Cup happen without Mathematics?.

Children will tackle open-ended problem solving and further develop their understanding at Greater Depth as appropriate using activities from the First4Maths Digging Deeper books and nRich.