

# Tower Hill Primary School Mathematics Progression Framework – Year 5

Y5	Number and Place Value	Addition and Subtraction	Multiplication and Division	Fractions	Measurement	Geometry		Statistics
						Properties of Shape	Position and Direction	
Problem Solving	solve problems and practical problems involving rounding and working with large numbers.	solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.	<p>solve problems involving addition, subtraction, multiplication and division including using their knowledge of factors and multiples, squares and cubes.</p> <p>solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign.</p> <p>solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates.</p>	<p>solve problems involving number up to three decimal places</p> <p>solve problems which require knowing percentage and decimal equivalents of <math>\frac{1}{2}</math>, <math>\frac{1}{4}</math>, <math>\frac{1}{5}</math>, <math>\frac{2}{5}</math>, <math>\frac{4}{5}</math> and those with a denominator of a multiple of 10 or 25.</p>	<p>solve problems involving converting between units of time.</p> <p>use all four operations to solve problems involving measure (eg: length, mass, volume, money) using decimal notation including scaling.</p>			solve comparison, sum and difference problems using information presented in a line graph
Year 5, Phase 1 – Sept – Nov	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>* read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit.</li> <li>* round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000</li> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>*Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy.</li> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>*identify multiples and factors, including finding all factor pairs of a number and common factors of two numbers.</li> <li>*know and use the vocabulary of prime numbers</li> <li>*Multiply and divide numbers mentally drawing upon known facts.</li> <li>*multiply and divide whole numbers and those involving decimals by 10, 100.</li> <li>*solve problems involving addition, subtraction, multiplication and division.</li> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>*compare and order fractions whose denominators are all multiples of the same number.</li> <li>*recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements <math>&gt;1</math> as a mixed number eg: <math>\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1 \frac{1}{5}</math>.</li> <li>*add and subtract fractions with the same denominator.</li> <li>*round decimals with one decimal place to nearest whole number.</li> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>*convert between different units of metric measure eg: kilometre and metre, centimetre and metre and millimetre, gram and kilogram, litre and millilitre</li> <li>*measure and calculate the perimeter of composite shapes in centimetres and metres</li> <li>*calculate and compare the area of rectangles (including squares) and including using standard units, square centimetres and square metres and estimate the area of irregular shapes</li> <li>*solve problems involving converting between units of time</li> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>*identify 3D shapes, including cubes and other cuboids, from 2D representations</li> <li>*know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles.</li> <li>*identify angles at a point and one whole turn (total <math>360^\circ</math>)</li> </ul>	<p>Pupils should be taught to:</p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>*complete, read and interpret information in tables, including timetables.</li> </ul>

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Year 5, Phase 2 – Nov – Feb	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"><li>* read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit.</li><li>*count forwards or backwards in steps of powers of 10 for any given number up to 1000000.</li><li>*interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers through zero</li><li>* round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000</li></ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"><li>*add and subtract whole numbers with more than 4 digits, including using formal written methods (column addition and subtraction)</li><li>*add and subtract numbers mentally with increasingly large numbers eg: 12462 – 2300 = 10612</li><li>*Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy.</li></ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"><li>*identify multiples and factors, including finding all factor pairs of a number and common factors of two numbers.</li><li>*know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers.</li><li>*Multiply numbers up to 4 digits by a one or two digit number</li><li>*Multiply and divide numbers mentally drawing upon known facts.</li><li>*multiply and divide whole numbers and those involving decimals by 10, 100.</li><li>*Recognise and use square numbers and the notation for squared</li><li>*solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign.</li></ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"><li>*compare and order fractions whose denominators are all multiples of the same number</li><li>*identify name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths</li><li>*recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements &gt;1 as a mixed number eg: <math>2\frac{2}{5}+4\frac{1}{5} = 6\frac{3}{5} = 1\frac{1}{5}</math></li><li>*add and subtract fractions with the same denominator and multiples of the same number</li><li>*read and write decimal numbers as fractions eg: <math>0.71 = \frac{71}{100}</math></li><li>*recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents.</li><li>*round decimals with two decimal places to the nearest whole number and to one decimal place</li><li>*recognise the per cent symbol and understand that per cent relates to number of parts per hundred and write percentages as a fraction with denominator hundred and as a decimal fraction.</li></ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"><li>*convert between different units of metric measure eg: kilometre and metre, centimetre and metre and millimetre, gram and kilogram, litre and millilitre</li><li>*measure and calculate the perimeter of composite shapes in centimetres and metres</li><li>*calculate and compare the area of rectangles (including squares) and including using standard units, square centimetres and square metres and estimate the area of irregular shapes</li><li>*solve problems involving converting between units of time</li></ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"><li>*identify 3D shapes, including cubes and other cuboids, from 2D representations</li><li>*know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles.</li><li>*draw given angles and measure them in degrees</li><li>*identify angles at a point and one whole turn (total 360°)</li><li>*angles at a point on a straight line and <math>\frac{1}{2}</math> a turn and other multiples of 90°</li></ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"><li>*complete, read and interpret information in tables, including timetables.</li></ul>	

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Year 5, Phase 3 – Feb – Apr	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>* read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit.</li> <li>*count forwards or backwards in steps of powers of 10 for any given number up to 1000000.</li> <li>*interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers through zero</li> <li>* round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000</li> <li>*read Roman numerals to 1000 (M) and recognise years written in Roman numerals</li> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>*add and subtract whole numbers with more than 4 digits, including using formal written methods (column addition and subtraction)</li> <li>*add and subtract numbers mentally with increasingly large numbers eg: 12462 – 2300 = 10612</li> <li>*Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy.</li> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>*identify multiples and factors, including finding all factor pairs of a number and common factors of two numbers.</li> <li>*know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers.</li> <li>*Establish whether a number up to 100 is prime and recall prime numbers up to 19.</li> <li>*Multiply numbers up to 4 digits by a one or two digit number using a formal written method, including long multiplication for two digit numbers.</li> <li>*Multiply and divide numbers mentally drawing upon known facts.</li> <li>*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.</li> <li>*multiply and divide whole numbers and those involving decimals by 10, 100 and 1000.</li> <li>*recognise and use square numbers and the notation for squared and cubed.</li> <li>*solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign</li> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>*compare and order fractions whose denominators are all multiples of the same number</li> <li>*identify name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths</li> <li>*recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements <math>&gt;1</math> as a mixed number eg: <math>2/5 + 4/5 = 6/5 = 1 \frac{1}{5}</math></li> <li>*add and subtract fractions with the same denominator and multiples of the same number</li> <li>*multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams.</li> <li>*read and write decimal numbers as fractions eg: <math>0.71 = 71/100</math></li> <li>*recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents.</li> <li>*round decimals with two decimal places to the nearest whole number and to one decimal place</li> <li>*read, write, order and compare numbers with up to three decimal places</li> <li>*solve problems involving numbers up to three decimal places.</li> <li>*recognise the per cent symbol and understand that per cent relates to number of parts per hundred and write percentages as a fraction with denominator hundred and as a decimal fraction.</li> <li>*solve problems which require knowing percentage and decimal equivalents of <math>\frac{1}{2}</math>, <math>\frac{1}{4}</math>, <math>1/5</math>, <math>2/5</math>, <math>4/5</math> and those with a denominator of a multiple of 10 or 25.</li> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>*convert between different units of metric measure eg: kilometre and metre, centimetre and metre and millimetre, gram and kilogram, litre and millilitre</li> <li>*understand and use equivalences between metric units and common imperial units such as inches, pounds and pints</li> <li>*measure and calculate the perimeter of composite shapes in centimetres and metres</li> <li>*read and write decimal numbers as fractions eg: <math>0.71 = 71/100</math></li> <li>*calculate and compare the area of rectangles (including squares) and including using standard units, square centimetres and square metres and estimate the area of irregular shapes</li> <li>*estimate volume eg: using 1cm<sup>3</sup> blocks to build cubes and cuboids and capacity eg: using water</li> <li>*solve problems involving converting between units of time</li> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>*identify 3D shapes, including cubes and other cuboids, from 2D representations</li> <li>*know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles.</li> <li>*draw given angles and measure them in degrees</li> <li>*identify angles at a point and one whole turn (total 360°)</li> <li>*angles at a point on a straight line and <math>\frac{1}{2}</math> a turn and other multiples of 90°</li> <li>*use the properties of rectangles to deduce related facts and find missing lengths and angles.</li> <li>*distinguish between regular and irregular polygons based in reasoning about equal sides and angles.</li> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>*identify, describe and represent the position of a shape following a reflection or translation, using appropriate language, and know that the shape has not changed.</li> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>*complete, read and interpret information in tables, including timetables.</li> </ul>