



## Key Learning in Mathematics – Year 5

Number – number and place value	Number – addition and subtraction	Number – multiplication and division
<ul style="list-style-type: none"> <li>Count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000</li> <li>Count forwards and backwards in decimal steps</li> <li>Read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit</li> <li>Read, write, order and compare numbers with up to 3 decimal places</li> <li>Identify the value of each digit to three decimal places</li> <li>Identify represent and estimate numbers using the number line</li> <li>Find 0.01, 0.1, 1, 10, 100, 100 and other powers of 10 more or less than a given number</li> <li>Round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000</li> <li>Round decimals with two decimal places to the nearest whole number and to one decimal place</li> <li>Multiply/divide whole numbers and decimals by 10, 100 and 1000</li> <li>Interpret negative numbers in context, count on and back with positive and negative whole numbers, including through zero</li> <li>Describe and extend number sequences including those with multiplication/division steps and where the step size is a decimal</li> <li>Read Roman numerals to 1000 (M); recognise years written as such</li> <li>Solve number and practical problems that involve all of the above</li> </ul>	<ul style="list-style-type: none"> <li>Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting, written method)</li> <li>Select a mental strategy appropriate for the numbers involved in the calculation</li> <li>Recall and use addition and subtraction facts for 1 and 10 (with decimal numbers to one decimal place)</li> <li>Derive and use addition and subtraction facts for 1 (with decimal numbers to two decimal places)</li> <li>Add and subtract numbers mentally with increasingly large numbers and decimals to two decimal places</li> <li>Add and subtract whole numbers with more than 4 digits and decimals with two decimal places, including using formal written methods (columnar addition and subtraction)</li> <li>Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy</li> <li>Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why</li> <li>Solve addition and subtraction problems involving missing numbers</li> </ul>	<ul style="list-style-type: none"> <li>Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting, written method)</li> <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>Recognise and use square (<sup>2</sup>) and cube (<sup>3</sup>) numbers, and notation</li> <li>Use partitioning to double or halve any number, including decimals to two decimal places</li> <li>Multiply and divide numbers mentally drawing upon known facts</li> <li>Solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes</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>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>Use estimation/inverse to check answers to calculations; determine, in the context of a problem, an appropriate degree of accuracy</li> <li>Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign</li> <li>Solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates</li> </ul>
Number – fractions, decimals and percentages	Geometry – properties of shapes	Measurement
<ul style="list-style-type: none"> <li>Recognise mixed numbers and improper fractions and convert from one form to the other</li> <li>Read and write decimal numbers as fractions (e.g. <math>0.71 = \frac{71}{100}</math>)</li> <li>Count on and back in mixed number steps such as <math>1\frac{1}{2}</math></li> <li>Compare and order fractions whose denominators are all multiples of the same number (including on a number line)</li> <li>Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths</li> <li>Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents</li> <li>Add and subtract fractions with denominators that are the same and that are multiples of the same number (using diagrams)</li> <li>Write statements <math>&gt; 1</math> as a mixed number (e.g. <math>\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1\frac{1}{5}</math>)</li> <li>Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams</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 100, and as a decimal</li> <li>Solve problems involving fractions and decimals to three places</li> <li>Solve problems which require knowing percentage and decimal equivalents of <math>\frac{1}{2}, \frac{1}{4}, \frac{1}{5}, \frac{2}{5}, \frac{4}{5}</math> and fractions with a denominator of a multiple of 10 or 25</li> </ul>	<ul style="list-style-type: none"> <li>Distinguish between regular and irregular polygons based on reasoning about equal sides and angles</li> <li>Use the properties of rectangles to deduce related facts and find missing lengths and angles</li> <li>Identify 3-D shapes from 2-D 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: <ul style="list-style-type: none"> <li>angles at a point and one whole turn (total 360°)</li> <li>angles at a point on a straight line and half a turn (total 180°)</li> <li>other multiples of 90°</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Use, read and write standard units of length and mass</li> <li>Estimate (and calculate) volume ((e.g., using 1 cm<sup>3</sup> blocks to build cuboids (including cubes)) and capacity (e.g. using water)</li> <li>Understand the difference between liquid volume and solid volume</li> <li>Continue to order temperatures including those below 0°C</li> <li>Convert between different units of metric measure</li> <li>Understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints</li> <li>Measure/calculate the perimeter of composite rectilinear shapes</li> <li>Calculate and compare the area of rectangle, use standard units square centimetres (cm<sup>2</sup>) and square metres (m<sup>2</sup>) and estimate the area of irregular shapes</li> <li>Continue to read, write and convert time between analogue and digital 12 and 24-hour clocks</li> <li>Solve problems involving converting between units of time</li> <li>Use all four operations to solve problems involving measure using decimal notation, including scaling</li> </ul>
	Geometry – position and direction	
	<ul style="list-style-type: none"> <li>Describe positions on the first quadrant of a coordinate grid</li> <li>Plot specified points and complete shapes</li> <li>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</li> </ul>	
	Statistics	
	<ul style="list-style-type: none"> <li>Complete and interpret information in a variety of sorting diagrams (including those used to sort properties of numbers and shapes)</li> <li>Complete, read and interpret information in tables and timetables</li> <li>Solve comparison, sum and difference problems using information presented in all types of graph including a line graph</li> <li>Calculate and interpret the mode, median and range</li> </ul>	



### Arithmetic Expectations – Year 5


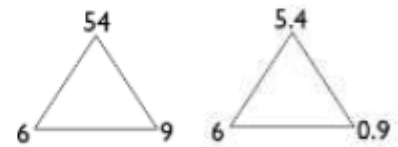
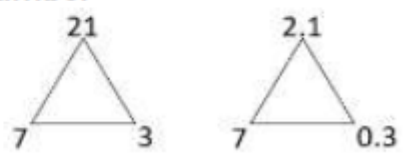
Skills	Examples
<b>Counting</b>	
Count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000.	Count on from 34 642 in hundreds. What four numbers would come next in this counting sequence? 422 734, 412 734...
Count forwards or backwards in decimal steps.	Continue this count: 4.4, 3.8, 3.2,... What four numbers would come next in this counting sequence? 2.16, 2.27, 3.38...
Find 0.01, 0.1, 1, 10, 100, 1000 and other powers of 10 more or less than a given number.	154 041 – 100      474 985 + 1 000      202 883 – 10 000 23.47 + 0.1      6.07 – 0.1      31.09 + 0.01      12.3 – 0.01
<b>Number Facts</b>	
Recall addition and subtraction facts for 1 and 10 (with numbers to one decimal place).	0.6 + 0.4 = ___    0.2 + ___ = 1    1 = ___ + 0.5    1 – 0.3 = ___    1 – ___ = 0.1 0.7 = 1 – ___ 1.3 + 8.7 = ___    2.5 + ___ = 10    10 = ___ + 4.6    10 – 5.2 = ___    10 – ___ = 6.3 1.9 = 10 – ___
Recall related tables facts for multiples of 10	70 × 6 8 × 40 90 × 6
Recall prime numbers up to 19	Instantly know the prime numbers 2, 3, 5, 7, 11, 13, 17 and 19
Recall square (²) numbers up to 12 × 12	Instantly know the square of all numbers to 12: 1² = 1, 2² = 4, 3² = 9, 4² = 16, 5² = 25, 6² = 36, 7² = 49, 8² = 64, 9² = 81, 10² = 100, 11² = 121 and 12² = 144
<b>Mental Calculation Strategies – Addition and Subtraction</b>	
Derive and use addition and subtraction facts for 1 (with decimal numbers to two decimal places) <i>Concrete – (if necessary) place value counters</i> <i>Pictorial – number line</i>	0.45 + ___ = 1 ___ + 0.27 = 1 1 = 0.39 + ___ 1 = ___ + 0.78 1 – 0.08 = ___ 1 – ___ = 0.61 0.54 = 1 – ___ ___ = 1 – 0.89



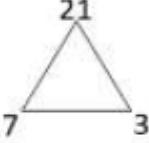
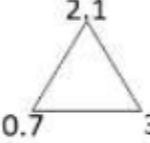


<p><b>Partition and combine multiples of thousands hundreds, tens and ones.</b>  <i>Concrete (if necessary) – place value counters</i>  <i>Pictorial – number line</i></p>	<p>4300 + 1400            364 + 250            3600 – 1200            432 – 240            5124 + 1352              7584 – 2351</p>	<p>4300 <b>add 1000</b> = 5300 then <b>add 400</b> = 5700            364 <b>add 200</b> = 564 then <b>add 50</b> = 614            3600 <b>subtract 1000</b> = 2600 then <b>subtract 200</b> = 2400            432 <b>subtract 200</b> = 232 then <b>subtract 40</b> = 192            5124 <b>add 1000</b> = 6124 then <b>add 300</b> = 6424 then <b>add 50</b> = 6474 then <b>add 2</b> = 6476            (not crossing any boundaries)            7584 <b>subtract 2000</b> = 5584 then <b>subtract 300</b> = 5284 then <b>subtract 50</b> = 5234 then <b>subtract 1</b> = 5233            (not crossing any boundaries)</p>
<p><b>Partition and combine multiples of ones and tenths.</b>  <i>Concrete (if necessary) – place value counters</i>  <i>Pictorial – number line</i></p>	<p>5.4 + 3.2            4.7 – 2.5</p>	<p>5.4 <b>add 3</b> = 7.4 then <b>add 0.2</b> = 7.6            4.7 <b>subtract 2</b> = 2.7 then <b>subtract 0.5</b> = 2.2</p>
<p><b>Identify and use knowledge of number bonds within a calculation and identify related facts, e.g. 1.5 + 2.7 from 15 + 27</b>  <i>Concrete (if necessary) – place value counters</i></p>	<p>1.2 + 0.8            2.5 + 1.3            3.8 + 4.5            2 – 0.7            4.6 – 1.5            8.3 – 5.4</p>	<p>using knowledge of 12 + 8 = 20            using knowledge of 25 + 13 = 38            using knowledge of 38 + 45 = 83            using knowledge of 20 – 7 = 13            using knowledge of 46 – 15 = 31            using knowledge of 83 – 54 = 29</p>
<p><b>Bridge through 10 when adding or subtracting a single digit number (partitioning, e.g. 58 + 5 = 58 + 2 + 3 or 76 – 8 = 76 – 6 – 2)</b>  <i>Concrete (if necessary) – Diennes equipment, place value counters</i>  <i>Pictorial – number line</i></p>	<p>594 + 170            1995 + 278            703 – 128            3002 – 87</p>	<p>as 594 + 6 + 164 = 600 + 164            as 1995 + 5 + 273 = 2000 + 273            as 703 – 3 – 125 = 700 – 125            as 3002 – 2 – 85 = 3000 – 85</p>
<p><b>Find differences by counting up through the next multiple of 1, 10, 100 or 1000</b>  <i>Concrete (if necessary) – place value counters</i>  <i>Pictorial – number line</i></p>	<p>604 – 289            523 – 160            1200 – 785            5003 – 1960            7.3 – 2.8            20.1 – 6.7</p>	<p>289 + <b>11</b> = 300 + <b>300</b> = 600 + <b>4</b> = 604 so the difference is <b>315</b>            160 + <b>40</b> = 200 + <b>300</b> = 500 + <b>23</b> = 523 so the difference is <b>363</b>            785 + <b>15</b> = 800 + <b>400</b> = 1200 so the difference is <b>415</b>            1960 + <b>40</b> = 2000 + <b>3003</b> = 5003 so the difference is <b>3043</b>            2.8 + <b>0.2</b> = 3 + <b>4</b> = 7 + <b>0.3</b> = 7.3 so the difference is <b>4.5</b>            6.7 + <b>3.3</b> = 10 + <b>10.1</b> = 20.1 so the difference is <b>13.4</b></p>
<p><b>Add or subtract a multiple of 10 and adjust (for those numbers close to multiples of 10)</b>  <i>Concrete (if necessary) – Diennes equipment, place value counters</i>  <i>Pictorial – number line</i></p>	<p>257 + 68            325 + 298            764 – 88            876 – 397</p>	<p>as 257 + 70 – 2 = 327 – 2            as 325 + 300 – 2 = 625 – 2            as 764 – 90 + 2 = 674 + 2            as 876 – 400 + 3 = 476 + 3</p>
<b>Mental Calculation Strategies – Multiplication and Division</b>		
<p><b>Multiply/divide whole numbers and decimals by 10, 100 and 1000</b>  <i>Concrete (if necessary) – Diennes equipment, place value counters</i>  <i>Pictorial – place value chart</i></p>	<p>75.91 × 10            5.07 × 10            670.4 × 100            360 × 1000            0.76 × 1000</p>	<p>874 ÷ 10            60.1 ÷ 10            7043 ÷ 100            48 750 ÷ 1000</p>



<p><b>Use related facts to multiply Th000 by a one-digit number and divide a ThH00 by a one-digit number</b>  <i>Pictorial – place value chart for multiplying/dividing by 1000, related facts multiplication trio and related facts division trio</i></p> 	<p><math>3000 \times 3</math> related to <math>3 \times 3 = 9</math>  <i>This should be understood as 'three thousand threes'.</i>  <i>As the number of 3s is 1000x greater than three threes, so the product is 1000x greater.</i>  <math>7000 \times 5</math>  <math>8000 \times 9</math></p> <p><math>7200 \div 9</math> related to <math>72 \div 9</math>  <i>This should be understood as 'how many nines in 7200? Compared to how many nines in 72?'</i>  <i>As the dividend is 100x greater, then the number of nines in it will be 100x greater.</i>  <math>3000 \div 6</math>  <math>9600 \div 8</math></p>
<p><b>Use related facts to multiply 0.t by a one-digit number</b>  <i>Pictorial – related facts multiplication trio</i></p> 	<p><math>0.3 \times 7</math> related <math>3 \times 7 = 21</math>  <i>The number of 7s is 10x less, so the product will be 10x less.</i>  <math>0.6 \times 9</math>  <math>0.5 \times 4</math></p>
<p><b>Use factor pairs to multiply T0 x T0</b>  <i>Pictorial – place value chart for multiplying by 100</i></p>	<p><math>30 \times 60</math> becomes <math>3 \times 10 \times 6 \times 10</math> reordered as <math>3 \times 6 \times 10 \times 10</math>  <math>70 \times 80</math> becomes <math>7 \times 10 \times 8 \times 10</math> reordered as <math>7 \times 8 \times 10 \times 10</math>  <math>50 \times 40</math> becomes <math>5 \times 10 \times 4 \times 10</math> reordered as <math>5 \times 4 \times 10 \times 10</math></p>
<p><b>Use compensation to multiply H99 by a one-digit number</b>          NB H99 represents a three-digit number with 9 tens and 9 ones  <i>Pictorial – rectangular array or a rectangle with given dimensions</i></p>	<p><math>599 \times 4</math> considered as <math>600 \times 4 - 1 \times 4</math> (read as 'six hundred fours subtract one four')  <math>399 \times 6</math> considered as <math>400 \times 6 - 1 \times 6</math> (read as 'four hundred sixes subtract one six')  <math>699 \times 9</math> considered as <math>700 \times 9 - 1 \times 9</math> (read as 'seven hundred nines subtract one nine')</p>
<p><b>Use partitioning to multiply U.t by a one-digit number</b>  <i>Pictorial – partitioning diagram using grid method strategy</i></p>	<p><math>6.7 \times 4</math> becomes <math>6 \times 4 + 0.7 \times 4</math>  <math>3.2 \times 7</math> becomes <math>3 \times 7 + 0.2 \times 7</math>  <math>8.5 \times 6</math> becomes <math>8 \times 6 + 0.5 \times 6</math></p>
<p><b>Use partitioning to double or halve numbers including those with two decimal places</b>  <i>Concrete (if necessary) – place value counters</i>  <i>Pictorial – partitioning diagram</i></p>	<p>Double 56.7                      Find half of 4.62          Double 485.6                  Find half of 18.46          Double 8.59                    Find half of 8.94          Double 36 742                 Find half of 17.92             Find half of 32 784</p>
<p><b>Use related facts to divide U.t by a one-digit number</b>  <i>Pictorial – place value chart, related facts division trio</i>          e.g. <math>21 \div 7 = 3</math> then <math>2.1 \div 7 = 0.3</math></p> 	<p><math>2.1 \div 7</math> related to <math>21 \div 7 = 3</math>  <i>This should be understood as 'how many sevens in 2.1? Compared to how many sevens in 21?'</i>  <i>As the dividend is 10x smaller, then the number of sevens in it will be 10x smaller.</i>  <math>3.6 \div 9</math>  <math>4.8 \div 4</math></p>



<p><b>Use related facts to divide U.t by a 0.t</b> <i>Pictorial – place value chart, related facts division trio</i> e.g. <math>21 \div 7 = 3</math> then <math>2.1 \div 0.7 = 3</math></p> <div style="display: flex; justify-content: space-around; align-items: center;"><div style="text-align: center;"><p>21</p></div><div style="text-align: center;"><p>2.1</p></div></div>	<p><math>2.1 \div 0.7</math> related to <math>21 \div 7 = 3</math> <i>This should be understood as 'how many 0.7s in 2.1? Compared to how many sevens in 21?'</i> <i>As the dividend is 10x smaller and the divisor is 10x smaller, then the answer (quotient) will be the same.</i> <math>3.6 \div 0.9</math> <math>4.8 \div 0.4</math></p>
<p><b>Use partitioning to divide HTU by a one-digit number</b> <i>Concrete (if necessary) – Diennes equipment, place value counters</i> <i>Pictorial – part-part-whole diagram</i></p>	<p><math>756 \div 9</math> By partitioning into 720 and 36 (two multiples of 9 totalling 756) <math>765 \div 5</math> By partitioning into 500 and 250 and 15 (three multiples of 5 totalling 765) <math>861 \div 7</math> By partitioning into 700 and 140 and 21 (three multiples of 7 totalling 861)</p>





Progression Towards Written Calculation Strategies – Addition	
<p>This final stage of the method should have been achieved in Year 3, and should be continued to be used for all written addition calculations.            The first example would be explained as follows:  <math>5 + 8 = 13</math>, put 3 down and carry the 10 (written as a 1 in the tens column)  <math>20 + 40 + 10</math> that was carried over = 70 (7 written in the tens column)  <math>600 + 0 = 600</math> (6 written in the hundreds column)  <b>Children will be expected to use this method for adding numbers with up to seven digits, numbers involving decimals and adding any number of amounts together.</b></p> <p><i>Supported (if necessary) by the use of place value counters.</i></p>	$  \begin{array}{r}  \text{HTU} \\  625 \\  + 48 \\  \hline  673 \\  \hline  1  \end{array}  $ $  \begin{array}{r}  367 \\  + 85 \\  \hline  452 \\  \hline  11  \end{array}  $ $  \begin{array}{r}  321 \\  + 7 \\  \hline  376 \\  \hline  1  \end{array}  $ $  \begin{array}{r}  \text{£}3.48 \\  + \text{£}0.78 \\  \hline  \text{£}4.26 \\  \hline  11  \end{array}  $
Progression Towards Written Calculation Strategies – Subtraction	
<p>This final stage is the compact method of decomposition should have been achieved in Year 4, and should be continued to be used for all written subtraction calculations.  <b>Children will be expected to use this method for subtracting numbers with up to seven digits and numbers involving decimals.</b></p> <p><i>Supported (if necessary) by the use of place value counters.</i></p>	<p>The example shown would be explained as follows:            We are subtracting 86 from 754. Start with the least significant place value column.            Are there enough hundredths to subtract 3 hundredths?            No – so let's exchange a tenth from the tenths column for ten hundredths. 2 tenths and 0 hundredths becomes 41 tenth and 10 hundredths.            10 hundredths subtract 3 hundredths = 8 hundredths            Are there enough tenths to subtract 8 tenths?            No – so let's exchange a one from the ones column for ten tenths.            1 one and 1 tenth becomes 0 ones and 1 tenths.            11 tenths subtract 8 tenths = 3 tenths.            Are there enough ones to subtract 4 ones?            No – so let's exchange a ten from the tens column for ten ones. 5 tens and 0 ones becomes 4 tens and 10 ones  <math>10 - 4 = 6</math>  <math>4 \text{ tens } (40) - 0 \text{ tens } = 4 \text{ tens } (40)</math>            Answer 46.37</p> <div style="text-align: right;"> <math display="block">  \begin{array}{r}  \overset{4}{5} \overset{10}{1} \overset{11}{1} \overset{1}{0} \\  51.20 \\  - 4.83 \\  \hline  46.37  \end{array}  </math> </div>
Progression Towards Written Calculation Strategies – Multiplication	
<p>As the grid method for multiplication supports children's number sense and appreciation of the values of each digit, schools can decide if this is the final stage of written multiplication.            It is often easier for children to keep track of the partial products calculated by using the grid method rather than the compact vertical method.            Concerns over 'acceptable methods' for 2 mark questions in the end of key stage 2 test should be weighed up against the improved chance of gaining 2 marks for the correct answer by using the grid method.</p>	$  \begin{array}{r}  4.92 \times 3 \\  \times \quad 4 \quad 0.9 \quad 0.02 \\  3 \quad \boxed{12} \quad \boxed{2.7} \quad \boxed{0.06} \\  \hline  12 \\  + 2.7 \\  + 0.06 \\  \hline  14.76  \end{array}  $ <p>Children may add these mentally.</p>



**Optional**

If schools wish to proceed to the compact vertical method for written multiplication then this is how it should progress, with different colours for the partial products to highlight how the steps taken are the same, just in a different order.

72 x 38

$$\begin{array}{r} \times \quad 70 \quad 2 \\ 30 \quad 2100 \quad 60 \\ 8 \quad 560 \quad 16 \end{array}$$

$$\begin{array}{r} 2100 \\ + 560 \\ + 60 \\ + 16 \\ \hline 2736 \end{array}$$

Children may add these mentally.

**Optional**

368 x 6

x	300	60	8	+	1800
6	1800	360	48	+	360
					48
					2208

$$\begin{array}{r} \text{Th H T U} \\ 368 \\ \times \quad 6 \\ \hline 48 \quad (8 \times 6) \\ 360 \quad (60 \times 6) \\ + 1800 \quad (300 \times 6) \\ \hline 2208 \end{array}$$

$$\begin{array}{r} \text{Th H T U} \\ 368 \\ \times \quad 6 \\ \hline 2208 \end{array}$$

$$\begin{array}{r} \text{Th H T U} \\ 368 \\ \times \quad 6 \\ \hline 48 \quad (8 \times 6) \\ 360 \quad (60 \times 6) \\ + 1800 \quad (300 \times 6) \\ \hline 2208 \end{array}$$

**Progression Towards Written Calculation Strategies – Division**

As the chunking method for division supports children's number sense and appreciation of the values of each digit, schools can decide if this is the final stage of written division. It can be used for both short and long division (Year 6 expectation) and leads to more efficient mental methods. As children develop their understanding of this method, they should use ever more efficient steps. The menu box may not need to be written, but the children should continue to think in this way.

$$\begin{array}{r} 32 \text{ r}4 \\ 6 \overline{)196} \\ - 180 \quad 30x \\ \hline 16 \\ - 12 \quad 2x \\ \hline 4 \end{array}$$

1x = 6
2x = 12
5x = 30
10x = 60
20x = 120

$$\begin{array}{r} 640 \text{ r}2 \\ 8 \overline{)5122} \\ - 4800 \quad 600x \\ \hline 322 \\ - 320 \quad 40x \\ \hline 2 \end{array}$$

**Decision Making**

- When calculating, children should ask themselves:
- do I know the answer because it is a fact I have learnt?
  - can I work it out easily in my head?
  - can I use some equipment or a jotting?
  - do I need to use the written method?

The strategies used within this document are taken from the Lancashire Mathematics Team Progression in Mental Calculation Strategies Policies and the Progression Towards Written Methods Policies.

See [www.lancsngfl.ac.uk/curriculum/primarymaths](http://www.lancsngfl.ac.uk/curriculum/primarymaths) for the full policies.





## Year 5 Mathematics Yearly Overview

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Week 1	Place Value	Mental Multiplication and Division	Place Value Counting and Negative Numbers	Mental and Written Division	Place Value Decimals	Place Value
Week 2	Place Value Decimals	Division	Addition and Subtraction	2-D and 3-D Shape Sorting	Fractions	Written Calculations
Week 3	Written Addition and Subtraction	Fractions (Compare, Order, Equivalence)	Mental and Written Multiplication	Calculating with Fractions	Measures (Time) and Statistics	Fractions Percentages
Week 4	Geometry (Angles)	Multiplication and Measures (Area)	Measures (Length, Mass and Capacity)	Measures (Area and Volume)	Geometry	Measures (Mass, Volume and Capacity)
Week 5	Geometry and Measures (Perimeter)	Statistics and Measures (Time)	Geometry (Reflection and Translation)	Statistics Measures Calculation	Addition and Subtraction	Area and Volume of Shapes
Week 6	Addition and Subtraction (Statistics)	Assess and Review	Geometry (Angles)	Assess and Review	Multiplication and Division	Assess and Review





YEAR 5	AUTUMN	
	Topic	Main Learning
	Place Value	<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>• Identify, represent and estimate numbers using the number line.</li> <li>• Count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000.</li> <li>• Describe and extend number sequences including those with multiplication and division steps and those where the step size is a decimal.</li> <li>• Round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000.</li> <li>• Solve number problems and practical problems that involve all of the above.</li> <li>• Find 1, 10, 100, 1000 and other powers of 10 more or less than a given number than a given number</li> </ul>
	Place Value (decimals)	<ul style="list-style-type: none"> <li>• Identify, represent and estimate numbers using the number line.</li> <li>• Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents.</li> <li>• Identify the value of each digit to three decimal places.</li> <li>• Read, write, order and compare numbers with up to three decimal places.</li> <li>• Find 0.01, 0.1, 1, 10, 100, 1000 and other powers of 10 more or less than a given number than a given number.</li> <li>• Count forwards and backwards in decimal steps.</li> <li>• Describe and extend number sequences including those with multiplication and division steps and those where the step size is a decimal.</li> <li>• Round decimals with two decimal places to the nearest whole number and to one decimal place.</li> <li>• Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000.</li> <li>• Solve problems involving number up to three decimal places</li> </ul>
	Written addition and subtraction	<ul style="list-style-type: none"> <li>• Add and subtract whole numbers with more than 4 digits and decimals with two decimal places, including using formal written methods (columnar addition and subtraction).</li> <li>• Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting, written method).</li> <li>• Use estimation and inverse to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.</li> <li>• Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.</li> </ul>
	Geometry (angles)	<ul style="list-style-type: none"> <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> </ul>
	Geometry and measures (perimeter)	<ul style="list-style-type: none"> <li>• Distinguish between regular polygons based on reasoning about equal sides and angles.</li> <li>• Use the properties of rectangles to deduce related facts and find missing lengths and angles.</li> <li>• Measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres.</li> </ul>
	Addition and subtraction using statistics	<ul style="list-style-type: none"> <li>• Solve comparison, sum and difference problems using information presented in a line graph.</li> <li>• Add and subtract numbers mentally with increasingly large numbers and decimals to two decimal places.</li> <li>• Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting, written method).</li> <li>• Select a mental strategy appropriate for the numbers involved in the calculation.</li> </ul>
	Mental multiplication and division	<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>• Establish whether a number up to 100 is prime.</li> <li>• Recognise and use square numbers and the notation for squared.</li> <li>• Use partitioning to double or halve any number, including decimals to two decimal places.</li> <li>• Multiply and divide numbers mentally drawing upon known facts.</li> <li>• Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting, written method).</li> <li>• Select a mental strategy appropriate for the numbers involved in the calculation.</li> <li>• Solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes.</li> </ul>
	Division	<ul style="list-style-type: none"> <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>• Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting, written method).</li> <li>• Solve problems involving division.</li> </ul>
	Fractions (comparison, order and equivalence)	<ul style="list-style-type: none"> <li>• Count on and back in mixed number steps.</li> <li>• Read and write decimal numbers as fractions.</li> <li>• Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths.</li> <li>• Compare and order fractions whose denominators are all multiples of the same number (including on a number line).</li> <li>• Solve problems involving fractions.</li> </ul>
	Multiplication and measures (area)	<ul style="list-style-type: none"> <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>• Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known or related fact, calculate mentally, use a jotting, written method).</li> <li>• Calculate and compare the area of rectangles (including squares), and including using standard units, square centimetres (cm<sup>2</sup>) and square metres (m<sup>2</sup>) and estimate the area of irregular shapes.</li> </ul>



<b>Statistics and measures (time)</b>	<ul style="list-style-type: none"> <li>Continue to read, write and convert time between analogue and digital 12 and 24-hour clocks.</li> <li>Complete, read and interpret information in tables, including timetables.</li> <li>Solve problems involving converting between units of time.</li> </ul>
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YEAR 5	SPRING	
	Topic	Main Learning
	<b>Place Value (counting including negative numbers)</b>	<ul style="list-style-type: none"> <li>Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers through zero.</li> <li>Calculate difference in temperature, including those that involve a positive and negative temperature.</li> <li>Describe and extend number sequences including those with multiplication and division steps and those where the step size is a decimal.</li> <li>Continue to order temperatures including those below 0°C.</li> <li>Read Roman numerals to 1000 (M) and recognise years written in Roman numerals.</li> </ul>
	<b>Addition and subtraction</b>	<ul style="list-style-type: none"> <li>Add and subtract numbers mentally with increasingly large numbers and decimals to two decimal places.</li> <li>Add and subtract whole numbers with more than 4 digits and decimals with two decimal places, including using formal written methods (columnar addition and subtraction).</li> <li>Use estimation and inverse to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.</li> <li>Calculate difference in temperature, including those that involve a positive and negative temperature.</li> <li>Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting, written method).</li> <li>Select a mental strategy appropriate for the numbers involved in the calculation.</li> <li>Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.</li> <li>Use all four operations to solve problems involving measure (for example, length, mass, volume, money) using decimal notation.</li> </ul>
	<b>Mental and written multiplication</b>	<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>Multiply and divide numbers mentally drawing upon known facts.</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>Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting, written method).</li> <li>Select a mental strategy appropriate for the numbers involved in the calculation.</li> <li>Solve problems involving multiplication including using their knowledge of factors and multiples, cubes and squares.</li> <li>Solve problems involving multiplication, including scaling by simple fractions and problems involving simple rates.</li> </ul>
	<b>Measurement (length, mass and capacity)</b>	<ul style="list-style-type: none"> <li>Use, read and write standard units of length and mass to a suitable degree of accuracy.</li> <li>Estimate (and calculate) capacity.</li> <li>Multiply and divide numbers and those involving decimals by 10, 100 and 1000.</li> <li>Convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre).</li> </ul>
	<b>Geometry (shape, reflection and translation)</b>	<ul style="list-style-type: none"> <li>Distinguish between regular and irregular polygons based on reasoning about equal sides and angles.</li> <li>Describe positions on the first quadrant of a coordinate grid.</li> <li>Plot specified points and complete shapes.</li> <li>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.</li> </ul>
	<b>Geometry (angles)</b>	<ul style="list-style-type: none"> <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>Identify angles at a point on a straight line and a turn (total 180°).</li> <li>Identify other multiples of 90°.</li> </ul>
	<b>Mental and written division</b>	<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>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>Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting, written method).</li> <li>Select a mental strategy appropriate for the numbers involved in the calculation.</li> <li>Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign.</li> <li>Solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates</li> </ul>
	<b>2D and 3D shape including sorting</b>	<ul style="list-style-type: none"> <li>Distinguish between regular and irregular polygons based on reasoning about equal sides and angles.</li> <li>Use the properties of rectangles to deduce related facts and missing lengths and angles.</li> <li>Identify 3-D shapes, including cubes and other cuboids, from 2-D representations.</li> <li>Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes</li> </ul>
	<b>Calculating with fractions</b>	<ul style="list-style-type: none"> <li>Recognise mixed number and improper fractions and convert from one form to the other.</li> <li>Add and subtract fractions with the same denominator and denominators that are multiples of the same number (using diagrams).</li> <li>Write mathematical statements <math>&gt; 1</math> as a mixed number</li> </ul>



	<b>Measurement (area and volume)</b>	<ul style="list-style-type: none"> <li>Calculate and compare the area of rectangles (including squares), and including using standard units, square centimetres (cm<sup>2</sup>) and square metres (m<sup>2</sup>) and estimate the area of irregular shapes.</li> <li>Understand the difference between liquid volume, including capacity and solid volume.</li> <li>Estimate (and calculate) volume (for example, using 1cm<sup>3</sup> blocks to build cuboids (including cubes)).</li> </ul>
	<b>Statistics, measures and calculations</b>	<ul style="list-style-type: none"> <li>Use, read and write standard units of length and mass to a suitable degree of accuracy.</li> <li>Estimate and calculate capacity.</li> <li>Calculate and interpret the mode, median and range.</li> <li>Add and subtract numbers mentally with increasingly large numbers and decimals to two decimal places.</li> <li>Add and subtract whole numbers with more than 4 digits and decimals with two decimal places, including using formal written methods.</li> <li>Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting, written method).</li> <li>Select a mental strategy appropriate for the numbers involved in the calculation.</li> <li>Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.</li> </ul>

YEAR 5	SUMMER	
	Topic	Main Learning
	<b>Place value including decimals</b>	<ul style="list-style-type: none"> <li>Identify, represent and estimate numbers using the number line.</li> <li>Read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit.</li> <li>Identify the value of each digit to three decimal places.</li> <li>Read, write, order and compare numbers with up to three decimal places.</li> <li>Count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000.</li> <li>Count forwards and backwards in decimal steps.</li> <li>Describe and extend number sequences including those with multiplication and division steps and those where the step size is a decimal.</li> <li>Round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000.</li> <li>Round decimals with two decimal places to the nearest whole number and to one decimal place.</li> <li>Solve number problems and practical problems that involve all of the above.</li> <li>Find 0.01, 0.1, 1, 10, 100, 1000 and other powers of 10 more or less than a given number than a given number.</li> </ul>
	<b>Fractions</b>	<ul style="list-style-type: none"> <li>Recognise mixed numbers and improper fractions and convert from one form to another.</li> <li>Compare and order fractions whose denominators are all multiples of the same number (including on a number line).</li> <li>Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths.</li> <li>Add and subtract fractions with the same denominator and denominators that are multiples of the same number (using diagrams).</li> <li>Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams.</li> </ul>
	<b>Measures (time and converting units) and statistics</b>	<ul style="list-style-type: none"> <li>Continue to read, write and convert time between analogue and digital 12 and 24-hour clocks.</li> <li>Complete, read and interpret information in tables, including timetables.</li> <li>Solve problems involving converting between units of time.</li> <li>Understand and use approximate equivalences between metric and common imperial units such as pints.</li> <li>Solve comparison, sum and difference problems using information presented in all types of graph including a line graph.</li> </ul>
	<b>Geometry</b>	<ul style="list-style-type: none"> <li>Distinguish between regular and irregular polygons based on reasoning about equal sides and angles.</li> <li>Use the properties of rectangles to deduce related facts and missing lengths and angles.</li> <li>Identify 3-D shapes, including cubes and other cuboids, from 2-D representations.</li> <li>Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes.</li> <li>Describe positions on the first quadrant of a coordinate grid.</li> <li>Plot specified points and complete shapes.</li> <li>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.</li> </ul>
	<b>Addition and subtraction</b>	<ul style="list-style-type: none"> <li>Add and subtract whole numbers with more than 4 digits and decimals with two decimal places, including using formal written methods (columnar addition and subtraction).</li> <li>Add and subtract numbers mentally with increasingly large numbers and decimals to two decimal places.</li> <li>Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting, written method).</li> <li>Select a mental strategy appropriate for the numbers involved in the calculation.</li> <li>Use estimation and inverse to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.</li> <li>Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.</li> </ul>
	<b>Multiplication and division</b>	<ul style="list-style-type: none"> <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 cube numbers, and the notation for squared (²) and cubed (³).</li> <li>Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting, written method).</li> <li>Select a mental strategy appropriate for the numbers involved in the calculation.</li> </ul>





Ellel St. John's CofE Primary School **Year 5 Maths Curriculum**

	<ul style="list-style-type: none"> <li>Solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates.</li> </ul>
<b>Place value</b>	<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 1 000 000.</li> <li>Describe and extend number sequences including those with multiplication and division steps and those where the step size is a decimal.</li> <li>Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero.</li> <li>Continue to order temperatures including those below 0°C.</li> <li>Round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000.</li> <li>Solve number problems and practical problems that involve all of the above.</li> </ul>
<b>Written calculation</b>	<ul style="list-style-type: none"> <li>Add and subtract whole numbers with more than 4 digits and decimals with two decimal places, including using formal written methods (columnar addition and subtraction).</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>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>Choose an appropriate strategy to solve a calculation based upon the numbers involved (recall a known fact, calculate mentally, use a jotting, written method).</li> <li>Use estimation and inverse to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.</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>
<b>Fractions (rounding, percentages and problem solving)</b>	<ul style="list-style-type: none"> <li>Round decimals with two decimal places to the nearest whole number and to one decimal place.</li> <li>Solve problems involving number 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 100, and as a decimal.</li> <li>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 fractions with a denominator of a multiple of 10 or 25.</li> </ul>
<b>Measures (mass, volume, capacity and time)</b>	<ul style="list-style-type: none"> <li>Solve problems involving converting between units of time.</li> <li>Use all four operations to solve problems involving measure (for example, mass, capacity and volume) using decimal notation, including scaling.</li> <li>Understand the difference between liquid volume, including capacity and solid volume.</li> <li>Understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints.</li> </ul>
<b>Area and volume of shapes</b>	<ul style="list-style-type: none"> <li>Calculate and compare the area of rectangles (including squares), and including using standard units, square centimetres (cm<sup>2</sup>) and square metres (m<sup>2</sup>) and estimate the area of irregular shapes.</li> <li>Understand the difference between liquid volume, including capacity and solid volume.</li> <li>Estimate volume (for example, using 1 cm<sup>3</sup> blocks to build cuboids (including cubes) and capacity (for example, using water).</li> </ul>