



**Mental Maths Essentials - Home Guide**


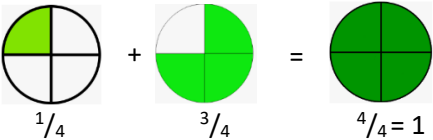
**KS1**

Year Group	Year 1	Year 2
Number bonds	<p><b>Number pairs to 10</b> E.g. 1 + 9, 2 + 8, 3 + 7 etc.</p>	<p><b>Recall of number pairs to 20</b> E.g. 10 + 10, 11 + 9, 12 + 8 etc.</p> <p><b>Number pairs to 100 (multiplies of 10)</b> E.g. 10 + 90, 20 + 80, 30 + 70 etc.</p>
Number facts	<p><b>Addition facts 1-5</b> E.g. 1 + 4, 3 + 2, etc.</p> <p><b>One more or less than any 2-digit number</b> E.g. 12 - 1 = 11, 12 + 1 = 13 etc.</p> <p><b>Ten more or less than any 2-digit number.</b> E.g. 24 - 10 = 14, 24 + 10 = 34 etc.</p>	<p><b>Number facts for all numbers to 12</b> E.g. 8 + 3, 7 + 5, 4 + 7 etc.</p> <p><b>What needs to be added to a 2 digit to make next multiple of 10</b> E.g. 34 + ___ = 40, 67 + ___ = 70 etc.</p> <p><b>Subtract a single digit number from a multiple of 10 less than 100</b> E.g. 90 - 6 = 84, 70 - 3 = 67 etc.</p> <p><b>Add or subtract a single digit number from a 2-digit number crossing a 10s boundary.</b> E.g. 34 + 8 = 42, 82 - 5 = 77 etc.</p>
Doubles and halves	<p><b>Doubles and halves numbers to 20</b> E.g. double 11 = 22, half 18 = 9 etc.</p> <p><b>Add near doubles</b> E.g. 5 + 6 = 11 (5 + 5 = 10 + 1 = 11)</p> <p><b>Partition and adjust numbers up to 10</b> E.g. 8 + 6 = 14 (8 + 2 + 4 = 14)</p>	<p><b>Doubles and halves up to 40</b> E.g. double 16 = 32, half of 24 = 12 etc.</p> <p><b>Add near doubles under 40</b> E.g. 14 + 15 = (14 + 14 = 28 + 1 = 29)</p>
Table facts	<p><b>Counting out loud in 2, 5 and 10</b> E.g. 2, 4, 6, 8, 10...</p>	<p><b>Quick recall of 2, 5 and 10 facts</b> E.g. 3 x 5 = 15, 6 x 10 = 60 etc.</p>
Fractions, decimals and percentages	<p><b>Recognise ½ and ¼ of shape or quantity</b></p> <p>½ by splitting into 2 groups and counting how many in 1 group.</p> <p>¼ by splitting into 4 groups and counting how many in 1 group.</p>	<p><b>Recognise a 1/3, 1/4, 1/2 and 3/4 of a quantity or shape.</b></p> <p>1/3 by splitting into 3 groups and counting how many in 1 group.</p> <p>3/4 by splitting into 4 groups and counting how many in 3 groups.</p>
Number properties	<p><b>Odd and even numbers up to 20</b></p> <p>Odd: 1, 3, 5, 7, 9 etc. Even: 2, 4, 6, 8, 10 etc.</p>	<p><b>Recognise odd and even up to 100</b></p> <p>Look at the ones column Odd: 1, 3, 5, 7, 9 etc. Even: 2, 4, 6, 8, 10 etc.</p> <p>E.g. 47 is odd, 38 is even</p>
Measure	<p><b>Tell time to hour and half past</b> E.g. 11 o'clock, half past 4</p>	<p><b>Tell time to hour, half, quarter and 5 minutes.</b> E.g. 11 o'clock, half past 4, quarter to 8, 25 past 3 etc.</p>

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### LKS2

Year Group	Year 3	Year 4
Number bonds	<p><b>Pairs of 2 digit numbers that total 100</b> E.g. 21 + 79, 22 + 78, 23 + 77 etc.</p> <p><b>Number pairs to 1000 (multiplies of 100)</b> E.g. 100 + 900, 200 + 800, 300 + 700 etc.</p>	<p><b>Decimal pairs to 1 with 1dp</b> E.g. 0.9 + 0.1, 0.8 + 0.2, 0.7 + 0.3 etc.</p>
Number facts	<p><b>Number facts for numbers up to 20</b> E.g. 14 + 3, 2 + 15, 12 + 7 etc.</p> <p><b>Count on in 50 from 0</b> E.g. 50, 100, 150, 200 etc.</p> <p><b>Additions and differences for multiples of 10</b> E.g. 30 + 40 = 70, 90 - 30 = 60 etc.</p> <p><b>Add and subtract any 2-digit by partitioning and counting on.</b> E.g. 43 + 21 = 64 (40 + 20 = 60, 3 + 1 = 4, 60 + 4 = 64)</p> <p><b>Roman numerals to 12</b> E.g. I = 1, V = 5, X = 10 etc.</p>	<p><b>What must be added to a 3-digit number to make the next multiple of 100</b> E.g. 378 + 22 = 400, 539 + 61 = 600 etc.</p> <p><b>1000 more and less than a given number.</b> E.g. 3472 + 1000 = 4472, 3472 - 1000 = 2472</p> <p><b>Add or subtract near multiples of 10</b> E.g. 24 + 9 24 + 10 (then remove 1) = 33</p> <p style="padding-left: 40px;">24 + 11 24 + 10 (then add 1 more) = 34</p> <p><b>Count in multiples of 25.</b> E.g. 25, 50, 75, 100, 125 etc.</p> <p><b>Read Roman numerals to 100</b> E.g. XX = 20, L = 50, C = 100</p> <p><b>Find the difference between near multiples</b> E.g. 607-600 600 + 600 = 1200 1200 + 7 = 1207</p>
Doubles and halves	<p><b>Doubles and halves of numbers to 100 with ones numbers less than 5</b> E.g. double 34 = 64, half of 84 = 42 etc.</p> <p><b>Doubles and halves of multiples of 10 and 100</b> E.g. Double 30 = 60, Half of 400 = 200</p> <p><b>Add near doubles under 100</b> E.g. 34 + 35 = (34 + 34 = 68 + 1 = 69)</p>	<p><b>Addition of doubles and halve to 100</b> e.g. 38+38 E.g. double 40 = 80 80 - 4 = 76 (the 4 comes from adding 2 on to each 38)</p> <p><b>Revise doubles of multiples of 10 and 1000</b> E.g. Double 30 = 60, Half of 400 = 200</p> <p><b>Finding the number half way between 2 numbers</b> E.g. Halfway between 26 and 58 58 - 26 = 32 Half of 32 = 16 26 + 16 = 42</p>

<p>Table facts</p>	<p><b>Quick recall of 2, 3, 4, 5, 8, 10 and 11</b> E.g. <math>3 \times 4 = 12</math>, <math>8 \times 6 = 48</math> etc.</p> <p><b>Partition teen numbers to multiply by a single digit</b> E.g. <math>16 \times 3 =</math> (<math>10 \times 3 = 30</math>, <math>6 \times 3 = 18</math>, <math>30 + 18 = 48</math>)</p> <p><b>Multiply by 4 by double and double again</b> E.g. <math>15 \times 4</math> Double <math>15 = 30</math> Double <math>30 = 60</math></p> <p><b>Divide by 4 by halving and halving again</b> E.g. <math>60 \div 4</math> <math>60</math> halved = <math>30</math> <math>30</math> halved = <math>15</math></p>	<p><b>Recall of all multiplication fact 12x12</b> E.g. <math>3 \times 7 = 21</math>, <math>8 \times 9 = 72</math> etc.</p> <p><b>Partition and multiply a 2-digit number by a single digit.</b> E.g. <math>36 \times 3 =</math> (<math>30 \times 3 = 90</math>, <math>6 \times 3 = 18</math>, <math>90 + 18 = 108</math>)</p> <p><b>Multiply by 10 and 100</b> E.g. <math>37 \times 10 = 370</math>, <math>487 \times 100 = 487000</math> etc.</p> <p><b>Multiply by 8 by double, double and double again</b> E.g. <math>15 \times 8</math> Double <math>15 = 30</math> Double <math>30 = 60</math> Double <math>60 = 120</math></p> <p><b>Divide by 8 by halving, halving and halving again</b> E.g. <math>120 \div 8</math> <math>120</math> halved = <math>60</math> <math>60</math> halved = <math>30</math> <math>30</math> halved = <math>15</math></p>
<p>Fractions, decimals and percentages</p>	<p><b>Identifying a fraction less than 1</b> E.g.</p>  <p><math>\frac{5}{8}</math>      <math>\frac{3}{7}</math>      NOT <math>1\frac{1}{2}</math></p> <p><b>Fraction and decimal equivalents for halves and tenths.</b> E.g. <math>\frac{1}{2} = 0.5</math>, <math>\frac{2}{10} = 0.2</math>, <math>\frac{7}{10} = 0.7</math></p>	<p><b>Pairs of fractions to 1</b> E.g.</p>  <p><math>\frac{1}{4} + \frac{3}{4} = \frac{4}{4} = 1</math></p> <p><b>Fraction, Decimal, Percentage equivalents of 1/2, quarters, tenths and hundredths.</b> E.g. <math>\frac{1}{2} = 0.5 = 50\%</math>, <math>\frac{1}{4} = 0.25 = 25\%</math>, <math>\frac{3}{4} = 0.75 = 75\%</math>, <math>\frac{1}{10} = 0.1 = 10\%</math>    <math>\frac{1}{100} = 0.01 = 1\%</math> etc.</p> <p><b>Instant recall of fractions of amounts with numerators of 1</b> E.g. <math>\frac{1}{3}</math> of <math>120</math>, <math>\frac{1}{5}</math> of <math>45</math> etc.</p>
<p>Number properties</p>	<p><b>Recognise any odd and even number</b></p> <p>Look at the ones column Odd: 1, 3, 5, 7, 9 etc. Even: 2, 4, 6, 8, 10 etc.</p> <p>E.g. 347 is odd, 638 is even</p>	<p><b>Factor pairs for known multiplication facts</b> E.g. Factor pairs of 18: 1 and 18, 2 and 9, 3 and 6</p> <p><b>Common multiples</b> E.g. Common multiples of 30 and 18: 1, 3, 6</p>
<p>Measure</p>	<p><b>Key time facts e.g. minutes in an hour, days of the week, days in a month etc.</b> E.g. 60 minutes in 1 hour, 7 days in a week etc.</p> <p><b>Tell time to the nearest minute</b> E.g. 12 minutes past 6, 13 minutes to 5</p>	<p><b>Know all the units of measure.</b> E.g. mm, cm, m, km g, kg ml, l</p>

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### UKS2

Year Group	Year 5	Year 6
Number bonds	<p><b>Decimal pairs to 1 using 2dp</b> E.g. <math>0.81 + 0.09</math>, <math>0.72 + 0.28</math> etc.</p> <p><b>Decimal pairs to 10 with 2dp</b> E.g. <math>7.34 + 2.66</math>, <math>3.58 + 6.42</math> etc.</p>	<p><b>Decimal pairs for 3dp to whole numbers.</b> E.g. <math>3.475 + 0.552 = 4</math> <math>6.389 + 0.611 = 7</math> etc.</p>
Number facts	<p><b>What must be added to 4-digit number to make the next multiple of 1000</b> E.g. <math>3785 + 215 = 4000</math>, <math>5396 + 604 = 6000</math> etc.</p> <p><b>Add or subtract near multiples of numbers</b> E.g. <math>524 + 29</math> <math>524 + 30</math> (remove 1) = 553  <math>524 + 31</math> <math>524 + 30</math> (add 1 more) = 554</p> <p><b>What must be added to decimal with 1dp to make the next whole number?</b> E.g. <math>754.6 + 0.4 = 755</math> etc.</p> <p><b>Roman numerals to 1000</b> E.g. CL = 150, CM = 900, M = 1000</p>	<p><b>Count on back to through positive and negative numbers.</b> E.g. -5, -4, -3, -2, -1, 0, 1, 2, 3, 4</p> <p><b>Add positive and negative numbers together.</b> (temp) E.g. The temperature in the morning was <math>-5^{\circ}</math>. By lunchtime, it had risen by 10 degrees. What is the temperature at lunchtime?</p>
Doubles and halves	<p><b>Doubles and halves of decimals to 10 with 1dp</b> E.g. Double <math>4.7 = 9.4</math> Half of <math>6.8 = 3.4</math> etc.</p> <p><b>Finding the number half way between 2 numbers</b> E.g. Halfway between <math>2.6</math> and <math>5.8</math> <math>5.8 - 2.6 = 3.2</math> Half of <math>3.2 = 1.6</math> <math>2.6 + 1.6 = 4.2</math></p>	<p><b>Doubles and halves of decimals to 100</b> E.g. Double <math>38.7 = 77.4</math> Half of <math>98.2 = 49.1</math> etc.</p> <p><b>Finding the number half way between 2 numbers</b> E.g. Halfway between <math>-2</math> and <math>6</math> The difference between <math>-2</math> and <math>6 = 8</math> Half of <math>8 = 4</math> <math>-2 + 4 = 2</math></p>
Table facts	<p><b>Squares to 12x12</b> E.g. <math>4^2 = 4 \times 4 = 16</math>, <math>9^2 = 9 \times 9 = 81</math> etc.</p> <p><b>Use factors and multiples in multiplication.</b> E.g. <math>43 \times 4</math> is double <math>43 \times 2</math> (because we would double 2 to make 4) <math>43 \times 4 = 172</math>    <math>43 \times 2 = 86</math> Etc.</p> <p><b>Multiplication by 50 and 25</b> E.g. <math>6 \times 50 = 300</math> <math>6 \times 25 = 150</math></p> <p><b>Know tests for divisibility</b> E.g. a number is divisible by 3 if the sum of the digits is divisible by 3 (<math>129</math> is divisible by 3 because</p>	<p><b>Cubes to 10 x 10 x 10</b> E.g. <math>4^3 = 4 \times 4 \times 4 = 64</math> <math>9^3 = 9 \times 9 \times 9 = 729</math> etc.</p> <p><b>Use rounding in mental multiplication</b> E.g. <math>34 \times 19</math> is <math>34 \times 20 - 34</math></p>

	<p><math>1+2+9 = 12</math> and 12 can be divided by 3)</p> <p>E.g. A whole number is divisible by 4 if the last two digits are divisible by 4.</p> <p>1312 is (<math>12 \div 4 = 3</math>) Yes ✓</p> <p>7019 is not (<math>19 \div 4 = 4.75</math>) No ✗</p> <p><b>Revise multiplying and dividing by 4 and 8</b> (See Year 3 and 4 examples)</p>	
Fractions, decimals and percentages	<p><b>Equivalents to halves, quarters, tenths, hundredths, thirds and fifths.</b> See year 4 examples and E.g. <math>1/3 = 0.333 = 33.3\%</math> <math>1/5 = 0.2 = 20\%</math> etc.</p> <p><b>Mentally derive fractions of amounts. With numerator above 1 (divide by the denominator then multiply by the numerator)</b> E.g. <math>\frac{2}{3}</math> of 21 <math>21 \div 3 = 7</math> <math>7 \times 2 = 14</math></p>	<p><b>Equivalents to halves, quarters, tenths, hundredths, thirds and fifths. Try ninths and elevenths</b> See year 4 and 5 examples and E.g. <math>1/9 = 0.11111 = 11.1\%</math> <math>1/11 = 0.090909 = 9.09\%</math> etc.</p> <p><b>Mentally derive fractions of amounts.</b> With numerator above 1 See year 5 examples</p> <p><b>Percentages of amounts.</b> E.g. 30% of 120, 45% of 300</p>
Number properties	<p><b>Factor pairs numbers up to 100</b> E.g. Factor pairs of 52:1 and 52, 2 and 26, 4 and 13 etc.</p> <p><b>Prime numbers to 20</b> (A number that can only be divided by 1 and itself) E.g. 2, 3, 5, 7, 11, 13, 17, 19</p>	<p><b>Prime up to 100</b> E.g. 2,3,5,7,11,13,17,19, 23,29,31,37,41, 43,47,53,59,61,67,71, 73,79,83, 89 and 97</p> <p><b>Prime factors of numbers up to 100</b> A factor that is a prime number. In other words: any of the prime numbers that can be multiplied to give the original number.  E.g. The prime factors of 15 are 3 and 5 (because <math>3 \times 5=15</math>, and 3 and 5 are prime numbers).</p>
Measure	<p><b>Know all the metric conversions.</b> E.g. mm to cm, cm to m, m to km g to kg ml to l and vice versa</p>	<p><b>Revise the previous work.</b> See other year group examples.</p>