

# In maths we are learning about...



Four Operations	Knowledge Organiser																																											
<p><b>Key Vocabulary</b></p> <ul style="list-style-type: none"> <li>Add</li> <li>Total</li> <li>Make</li> <li>Plus</li> <li>Sum</li> <li>More</li> <li>Altogether</li> <li>Difference</li> <li>Leave</li> <li>Subtract</li> <li>Difference between</li> <li>Less</li> <li>Minus</li> <li>Take away</li> <li>Mentally, Orally</li> <li>Column Addition</li> <li>Column Subtraction</li> <li>Estimate</li> <li>Inverse operation</li> <li>Solve problems</li> <li>Number facts</li> <li>Place Value</li> <li>Complex</li> </ul>	<p style="color: #FFD700;"><b>Add and Subtract Whole Numbers</b></p> <p style="text-align: center;"><b>Column Method</b></p> <div style="display: flex; justify-content: space-around;"> <div style="width: 45%;"> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr><td></td><td>4</td><td>5</td><td>8</td><td>6</td><td>4</td></tr> <tr><td>+</td><td>2</td><td>3</td><td>4</td><td>9</td><td>7</td></tr> <tr><td></td><td>6</td><td>9</td><td>3</td><td>6</td><td>1</td></tr> <tr><td></td><td></td><td>1</td><td>1</td><td>1</td><td></td></tr> </table> <p>Starting with the ones, add each column in turn. Regroup tens, hundreds, thousands, ten thousands as required.</p> </div> <div style="width: 45%;"> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr><td></td><td>3</td><td>5</td><td><del>7</del></td><td><del>13</del></td><td><del>12</del></td></tr> <tr><td>-</td><td></td><td>3</td><td>4</td><td>7</td><td>6</td></tr> <tr><td></td><td>3</td><td>2</td><td>2</td><td>6</td><td>6</td></tr> </table> <p>Starting with the ones, subtract each column in turn. Exchange tens, hundreds, thousands and/or ten thousands as required.</p> </div> </div>			4	5	8	6	4	+	2	3	4	9	7		6	9	3	6	1			1	1	1			3	5	<del>7</del>	<del>13</del>	<del>12</del>	-		3	4	7	6		3	2	2	6	6
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<p><b>Short Division</b></p> <p style="text-align: center;">Start from the left.</p> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr><td></td><td>4</td><td>4</td><td>0</td><td>5</td></tr> <tr><td>12</td><td>5</td><td>2</td><td>8</td><td>6</td></tr> <tr><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td></tr> </table> <p><math>5 \div 12 = 0 \text{ r}5</math>  <math>52 \div 12 = 4 \text{ r}4</math>  <math>48 \div 12 = 4</math>  <math>6 \div 12 = 0 \text{ r}6</math></p>		4	4	0	5	12	5	2	8	6											<p><b>Common Factors</b></p> <p>Factors of 48</p> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>6</td><td>8</td><td>12</td><td>16</td><td>24</td><td>48</td></tr> </table> <p>Factors of 30</p> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr><td>1</td><td>2</td><td>3</td><td>5</td><td>6</td><td>10</td><td>15</td><td>30</td></tr> </table> <p>Common factors: 1, 2, 3, 6</p>	1	2	3	4	6	8	12	16	24	48	1	2	3	5	6	10	15	30	<p><b>Common Multiples</b></p> <p>Multiples of 3</p> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr><td>3</td><td>...</td><td>18</td><td>21</td><td>24</td><td>...</td><td>39</td><td>42</td></tr> </table> <p>Multiples of 7</p> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr><td>7</td><td>14</td><td>21</td><td>28</td><td>35</td><td>42</td></tr> </table> <p>Common multiples: 21, 42...</p>	3	...	18	21	24	...	39	42	7	14	21	28	35	42
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<p><b>Long Division</b></p> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr><td></td><td></td><td>1</td><td>2</td><td>0</td><td>r</td><td>3</td></tr> <tr><td>14</td><td>1</td><td>6</td><td>8</td><td>3</td><td></td><td></td></tr> <tr><td></td><td>1</td><td>4</td><td>0</td><td>0</td><td></td><td></td></tr> <tr><td></td><td></td><td>2</td><td>8</td><td>3</td><td></td><td></td></tr> <tr><td></td><td></td><td>2</td><td>8</td><td>0</td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td>3</td><td></td><td></td></tr> </table>			1	2	0	r	3	14	1	6	8	3				1	4	0	0					2	8	3					2	8	0							3			<p><b>Primes</b></p> <p>A prime number has only 1 and itself as factors: 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43</p> <p>A composite number has factors other than 1 and itself.</p>	<p><b>Squares and Cubes</b></p> <p>Square numbers result from a number being multiplied by itself (e.g. <math>5 \times 5 = 25</math>): 1, 4, 9, 16, 25, 36, 49, 64, 81, 100</p> <p>Cube numbers result from a number being multiplied by itself twice (<math>2 \times 2 \times 2 = 8</math>): 1, 8, 27, 64, 125</p>										
		1	2	0	r	3																																																
14	1	6	8	3																																																		
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	<p><b>Mental Calculations and Estimation</b></p> <p><b>Order of calculations:</b>  <math>50 \times 34 \times 2 = 50 \times 2 \times 34 = 100 \times 34 = 3400</math>                      Money: <math>\pounds 8.99 + \pounds 3.49 = \pounds 12.48</math>                      Use <math>\pounds 9 + \pounds 3.50 = \pounds 12.50</math> and subtract 2p                      Estimate on a number line</p> <table border="1" style="border-collapse: collapse; text-align: center; margin: 0 auto;"> <tr><td>-8</td><td>0</td><td>8</td><td>16</td><td>20</td><td>24</td></tr> <tr><td colspan="6"> ----- ----- ----- ----- ----- </td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table> <p>Subdivide line to estimate: <b>17</b></p>	-8	0	8	16	20	24	----- ----- ----- ----- -----												<p><b>Reason from Known Facts</b></p> <p><math>90 \div 10 = 9</math> so <math>90 \div 20 = 4.5</math> and <math>90 \div 5 = 18</math>  <math>16 \times 9 = 144</math> so <math>1.6 \times 9 = 14.4</math>  <math>4352 \div 17 = 256</math>                      so <math>256 \times 18 = 4352 + 256 = 4608</math>  <math>3786 + 2850 = 6636</math>                      so <math>4786 + 2850 = 7636</math>                      and <math>2786 + 3850 = 6636</math>                      and <math>8636 - 3786 = 4850</math></p>																																		
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