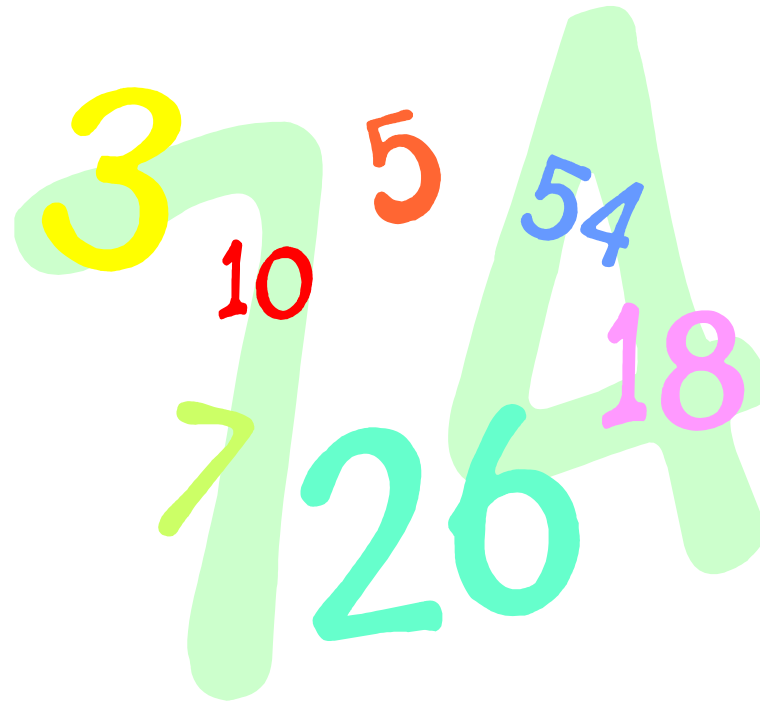


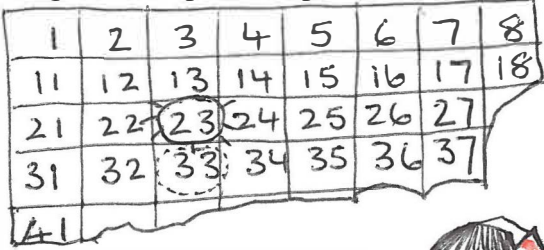
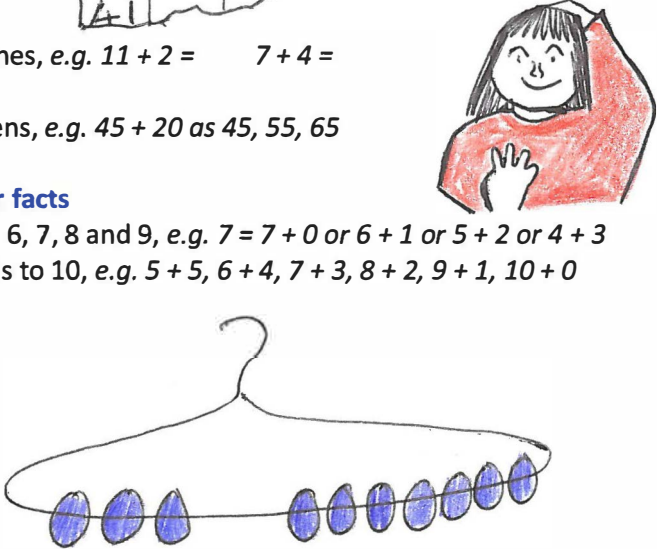
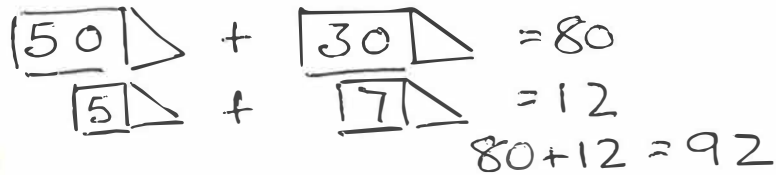
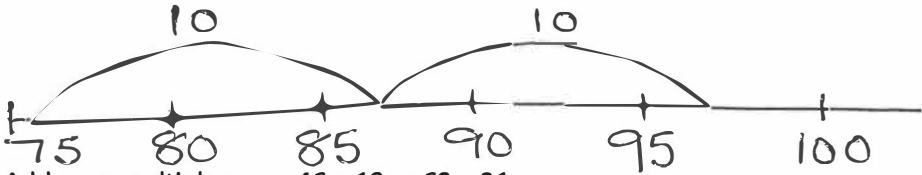
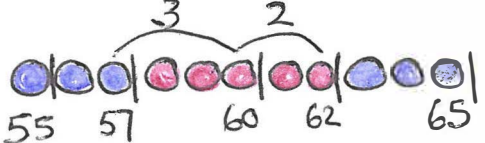
# Calculation Policy

**“Growing and learning together with God.”**

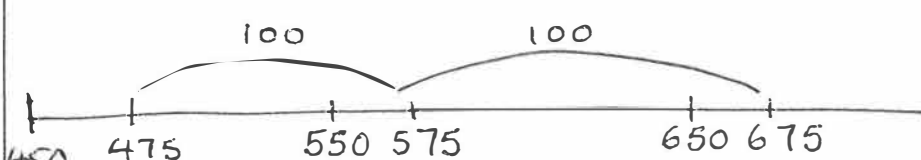

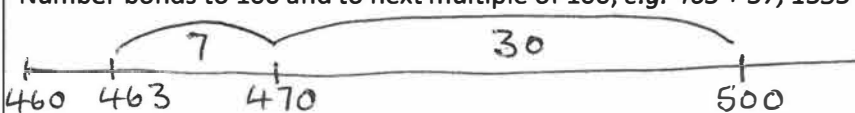
Children at Fritwell Church of England School are confident and inspired.  
They achieve personal success and show love and respect for all.



# Fritwell C of E Primary School - Calculation Policy October 2015

	Year 1	Year 2
Mental Addition	<p><b>Using Place value</b> Count in ones / Counting in tens, e.g. knowing <math>45 + 1</math> or <math>45 + 10</math> without counting on in ones</p> <p><math>23 + 10</math></p>  <p><b>Counting on</b> Count on in ones, e.g. <math>11 + 2 = 7 + 4 =</math></p> <p>Count on in tens, e.g. <math>45 + 20</math> as 45, 55, 65</p> <p><b>Using number facts</b> 'Story' of 4, 5, 6, 7, 8 and 9, e.g. <math>7 = 7 + 0</math> or <math>6 + 1</math> or <math>5 + 2</math> or <math>4 + 3</math> Number bonds to 10, e.g. <math>5 + 5, 6 + 4, 7 + 3, 8 + 2, 9 + 1, 10 + 0</math></p>  <p>Patterns using known facts, e.g. <math>4 + 3 = 7</math> so we know <math>24 + 3, 44 + 3, 74 + 3</math>, etc.</p>	<p><b>Using Place value</b> Know 1 more or 10 more than any number, e.g. 1 more than 67 or 10 more than 85 Partitioning, e.g. <math>55 + 37</math> as <math>50 + 30</math> and <math>5 + 7</math> finally combining the two totals: <math>80 + 12</math></p>  <p><b>Counting on</b> Add ten and multiples of ten, e.g. <math>76 + 20</math> as 76, 86, 96 or in one hop <math>76 + 20</math> Add two 2-digit numbers by counting on in tens then in ones, e.g. <math>55 + 37</math> as 55 add 30 (85) add 7 (92)</p>  <p>Add near multiples, e.g. <math>46 + 19</math> or <math>63 + 21</math></p> <p><b>Using number facts</b> Know pairs of numbers which make the numbers up to and including 10, e.g. <math>8 = 4 + 4, 3 + 5, 2 + 6, 1 + 7</math> and <math>10 = 5 + 5, 4 + 6, 3 + 7, 2 + 8, 1 + 9, 0 + 10</math> Patterns of known facts, e.g. <math>6 + 3 = 9</math>, so we know <math>36 + 3 = 39, 66 + 3 = 69, 53 + 6 = 59</math> Bridging ten, e.g. <math>57 + 5</math> as 57 add 3 then add 2 more</p>  <p>Adding three or more single-digit numbers, spotting bonds to 10 or doubles, e.g. <math>6 + 7 + 4 + 2</math> as <math>10 + 7 + 2</math></p>

# Fritwell C of E Primary School - Calculation Policy October 2015

	Year 3	Year 4																																																
Mental Addition	<p><b>Using Place value</b> Count in hundreds, e.g. knowing <math>475 + 200</math> as 475, 575, 675</p>  <p>Add multiples of 10, 100 and £1, e.g. <math>746 + 200</math> or <math>746 + 40</math> or <math>£6.34 + £5</math> as <math>£6 + £5</math> and 34p Partitioning, e.g. <math>68 + 74</math> as <math>60 + 70</math> and <math>8 + 4</math> and combine the totals: <math>130 + 12 = 142</math> or <math>£8.50 + £3.70</math> as <math>£8 + £3</math> and 50p + 70p and combine: <math>£11 + £1.20</math></p> <p><b>Counting on</b> Add two 2-digit numbers by adding the multiple of ten then the ones, e.g. <math>67 + 55</math> as 67 add 50 (117) add 5 (122) Add near multiples of 10 and 100, e.g. <math>67 + 39</math> or <math>364 + 199</math> Count on from 3-digit nos, e.g. <math>247 + 34</math> as <math>247 + 30</math> (277) then <math>277 + 4 = 281</math></p> <p><b>Using number facts</b> Number bonds to 100, e.g. <math>35 + 65</math>, <math>46 + 54</math>, <math>73 + 27</math>, etc. Add to next ten and next hundred, e.g. <math>176 + 4 = 180</math>, <math>435 + 65 = 500</math>, etc.</p>	<p><b>Using Place value</b> Count in thousands, e.g. knowing <math>475 + 200</math> as 475, 575, 675 Partitioning, e.g. <math>746 + 203</math> as <math>700 + 200</math> and <math>46 + 3</math> or <math>134 + 707</math> as <math>130 + 700</math> and <math>4 + 7</math></p> <p><b>Counting on</b> Add two 2-digit numbers by adding the multiple of ten then the ones, e.g. <math>67 + 55</math> as 67 add 50 (117) add 5 (122) Add near multiples of 10, 100 and 1000, e.g. <math>467 + 199</math> or <math>3462 + 2999</math></p>  <p>Count on to add 3-digit numbers and money, e.g. <math>463 + 124</math> as <math>463 + 100</math> (563) + 20 (583) + 4 = 587 or <math>£4.67 + £5.30</math> as <math>£9.67</math> add 30p</p> <p><b>Using number facts</b> Number bonds to 100 and to next multiple of 100, e.g. <math>463 + 37</math>, <math>1353 + 47</math></p>  <p>Number bonds to £1 and to the next whole pound, e.g. <math>£3.45 + 55p</math> Add to next whole number, e.g. <math>4.6 + 0.4</math>, <math>7.2 + 0.8</math></p>																																																
	Written Addition	<p>Build on partitioning to develop expanded column addition with two 3-digit numbers</p> <table data-bbox="725 979 983 1129"><tr><td>400</td><td>60</td><td>6</td></tr><tr><td>+ 300</td><td>50</td><td>8</td></tr><tr><td>700</td><td>110</td><td>14</td></tr></table> <p>Expanded column addition with 'carrying'</p> <table data-bbox="613 1155 871 1331"><tr><td>400</td><td>60</td><td>6</td></tr><tr><td>+ 300</td><td>50</td><td>8</td></tr><tr><td>100</td><td>10</td><td></td></tr><tr><td>800</td><td>20</td><td>4</td></tr></table> <p>Compact column addition with two or more 3-digit numbers or towers of 2-digit numbers</p> <table data-bbox="927 1155 1106 1394"><tr><td>347</td></tr><tr><td>286</td></tr><tr><td>495</td></tr><tr><td>21</td></tr><tr><td>1128</td></tr></table> <p>Compact column addition with 3-digit and 4-digit numbers</p>	400	60	6	+ 300	50	8	700	110	14	400	60	6	+ 300	50	8	100	10		800	20	4	347	286	495	21	1128	<p>Build on expanded column addition to develop compact column addition with larger numbers.</p> <table data-bbox="1621 979 1980 1171"><tr><td>1000</td><td>400</td><td>60</td><td>6</td></tr><tr><td>+ 4000</td><td>800</td><td>60</td><td>8</td></tr><tr><td>1000</td><td>100</td><td>10</td><td></td></tr><tr><td>6000</td><td>300</td><td>30</td><td>4</td></tr></table> <p>Compact column addition with larger numbers.</p> <table data-bbox="1644 1187 1823 1425"><tr><td>5347</td></tr><tr><td>2286</td></tr><tr><td>+ 1495</td></tr><tr><td>121</td></tr><tr><td>9128</td></tr></table> <p>Use expanded and compact column addition to add amounts of money.</p> <p>Add like fractions, e.g. <math>\frac{3}{8} + \frac{1}{8} + \frac{1}{8}</math></p>	1000	400	60	6	+ 4000	800	60	8	1000	100	10		6000	300	30	4	5347	2286	+ 1495	121	9128
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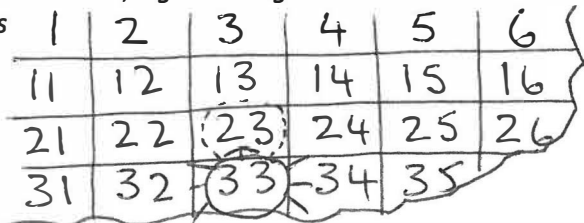
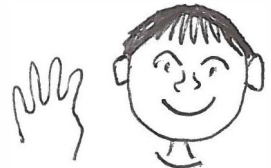
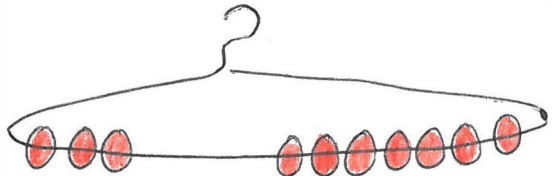
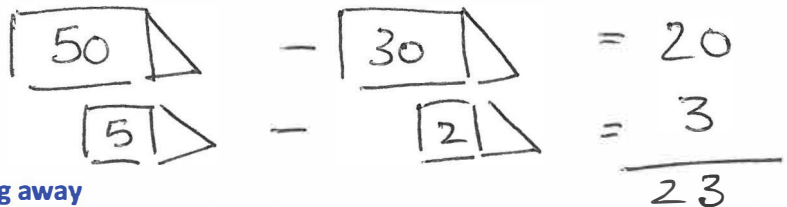
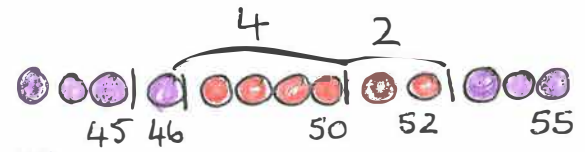
# Fritwell C of E Primary School - Calculation Policy October 2015

	Year 5	Year 6																																																																
Mental Addition	<p><b>Using Place value</b> Count in 0.1s, 0.01s, e.g. knowing what 0.1 more than 0.51 is</p> <table><tr><td>100s</td><td>10s</td><td>1s</td><td>0.1s</td><td>0.01s</td><td>0.001s</td></tr><tr><td></td><td></td><td></td><td>.5</td><td>1</td><td></td></tr><tr><td></td><td></td><td></td><td>.1</td><td></td><td></td></tr><tr><td></td><td></td><td></td><td>.6</td><td>1</td><td></td></tr></table> <p>Partitioning, e.g. <math>2.4 + 5.8</math> as <math>2 + 5</math> and <math>0.4 + 0.8</math> and combine the totals: <math>7 + 1.2 = 8.2</math></p> <table><tr><td>2.4</td><td>+</td><td>5.8</td><td></td></tr><tr><td>7</td><td></td><td></td><td>1.2 = 8.2</td></tr></table> <p><b>Counting on</b> Add two decimal numbers by adding the ones then the tenths/hundredths, e.g. <math>5.72 + 3.05</math> as <math>5.72</math> add 3 (<math>8.72</math>) then add 0.05 (<math>8.77</math>) Add near multiples of 1, e.g. <math>6.34 + 0.99</math> or <math>5.63 + 0.9</math> Count on from large numbers, e.g. <math>6834 + 3005</math> as <math>9834 + 5</math></p> <p><b>Using number facts</b> Number bonds to 1 and to the next whole number, e.g. <math>0.4 + 0.6</math> or <math>5.7 + 0.3</math></p> <p>Add to next ten from a decimal number, e.g. <math>7.8 + 2.2 = 10</math></p>	100s	10s	1s	0.1s	0.01s	0.001s				.5	1					.1						.6	1		2.4	+	5.8		7			1.2 = 8.2	<p><b>Using Place value</b> Count in 0.1s, 0.01s, 0.001s, e.g. knowing what 0.001 more than 6.725 is Partitioning, e.g. <math>9.54 + 3.25</math> as <math>9 + 3</math> and <math>0.5 + 0.2</math> and <math>0.04 + 0.05</math> to get 12.79</p> <table><tr><td>100s</td><td>10s</td><td>1s</td><td>0.1s</td><td>0.01s</td><td>0.001s</td></tr><tr><td></td><td></td><td>6</td><td>7</td><td>2</td><td>5</td></tr><tr><td></td><td></td><td>.</td><td>0</td><td>0</td><td>1</td></tr><tr><td></td><td></td><td>6</td><td>7</td><td>2</td><td>6</td></tr></table> <p><b>Counting on</b> Add two decimal numbers by adding the ones then the tenths/hundredths or thousandths, e.g. <math>6.314 + 3.006</math> as <math>6.314</math> add 3 (<math>9.314</math>) then add 0.006 (<math>9.32</math>) Add near multiples of 1, e.g. <math>6.345 + 0.999</math> or <math>5.673 + 0.9</math> Count on from large numbers, e.g. <math>16,375 + 12,003</math></p> <p><b>Using number facts</b> Number bonds to 1 and to next multiple of 1, e.g. <math>0.63 + 0.37</math> or <math>2.355 + 0.645</math> Add to next ten, e.g. <math>4.62 + 0.38</math></p> <table><tr><td>4</td><td>4.5</td><td>4.62</td><td>5</td></tr><tr><td colspan="4"><div>0.38</div></td></tr></table>	100s	10s	1s	0.1s	0.01s	0.001s			6	7	2	5			.	0	0	1			6	7	2	6	4	4.5	4.62	5	<div>0.38</div>			
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# Fritwell C of E Primary School - Calculation Policy October 2015


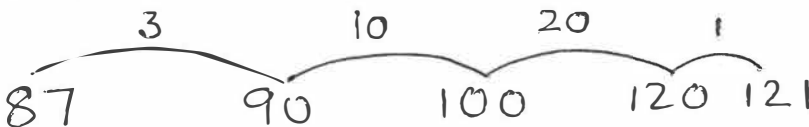


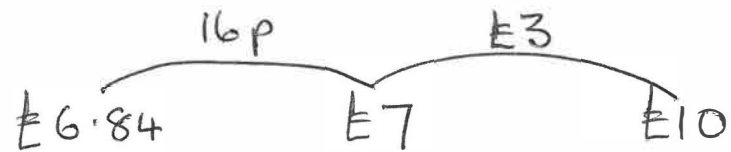
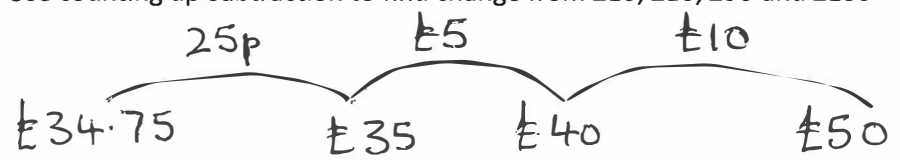
	Year 5	Year 6
Written Addition	<p>Expanded column addition for money leading to compact column addition for adding several amounts of money</p> <div> <math display="block">\begin{array}{r} \pounds 14 \quad 60\text{p} \quad 4\text{p} \\ \pounds 28 \quad 70\text{p} \quad 8\text{p} \\ + \pounds 12 \quad 20\text{p} \quad 6\text{p} \\ \hline \pounds 1 \quad 10\text{p} \\ \pounds 55 \quad 60\text{p} \quad 8\text{p} \end{array}</math> </div> <p>Compact column addition to add Pairs of 5-digit numbers</p> <p>Continue to use column addition to add towers of several larger numbers.</p> <div> <math display="block">\begin{array}{r} 15.68 \\ + 27.86 \\ \hline 11.1 \\ 43.54 \end{array}</math> </div> <p>Use compact addition to add decimal numbers with up to two places</p> <p>Adding fractions with related denominators, e.g. <math>\frac{1}{4} + \frac{3}{8} = \frac{5}{8}</math></p>	<p>Compact column addition for adding several large numbers and decimal numbers with up to two places</p> <div> <math display="block">\begin{array}{r} \pounds 14.64 \\ + \pounds 28.78 \\ \pounds 12.26 \\ 11.1 \\ \hline \pounds 55.68 \end{array}</math> </div> <p>Compact column addition with money</p> <p>Add fractions with unlike denominators, e.g. <math>\frac{3}{4} + \frac{1}{3} = 1 \frac{1}{12}</math> or <math>\frac{13}{12}</math>  <math>2 \frac{1}{4} + 1 \frac{1}{3} = 3 \frac{7}{12}</math></p>

# Fritwell C of E Primary School - Calculation Policy October 2015



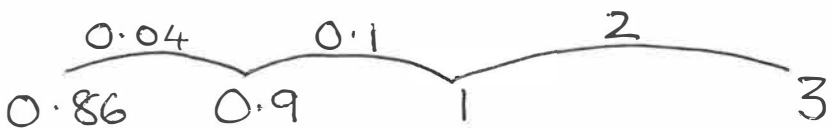


	Year 1	Year 2
Mental Subtraction	<p><b>Using Place value</b> Count back in ones / Count back in tens, e.g. knowing <math>53 - 1</math> or <math>53 - 10</math> without counting back in ones</p> <p><math>33 - 10</math></p>  <p><b>Taking away</b> Count back in ones, e.g. <math>11 - 3 =</math>    <math>15 - 4 =</math></p> <p>Count back in tens, e.g. <math>53 - 20</math> as 53, 43, 33</p>  <p><b>Using number facts</b> 'Story' of 4, 5, 6, 7, 8 and 9, e.g. <math>7 - 1 = 6</math>, <math>7 - 2 = 5</math>, <math>7 - 3 = 4</math>, etc. Number bonds to 10, e.g. <math>10 - 1 = 9</math>, <math>10 - 2 = 8</math>, <math>10 - 3 = 7</math>, etc.</p>  <p>Patterns using known facts, e.g. <math>7 - 3 = 4</math> so we know <math>27 - 3 =</math>, <math>47 - 3 =</math>, <math>77 - 4 =</math>, etc.</p>	<p><b>Using Place value</b> Know 1 less or 10 less than any number, e.g. 1 less than 74 or 10 less than 82 Partitioning, e.g. <math>55 - 32</math> as <math>50 - 30</math> and <math>5 - 2</math> combining the answers: <math>20 + 3</math></p>  <p><b>Taking away</b> Subtract ten and multiples of ten, e.g. <math>76 - 20</math> as 76, 66, 56 or in one hop <math>76 - 20 = 56</math> Subtract two 2-digit numbers by counting back in tens then in ones, e.g. <math>67 - 33</math> as 67 subtract 30 (37) then count back 3 (34) Subtracting near multiples, e.g. <math>74 - 21</math> or <math>57 - 19</math></p> <p><b>Using number facts</b> Know pairs of numbers which make the numbers up to and including 10, e.g. <math>10 - 6 = 4</math>, <math>8 - 3 = 5</math>, <math>5 - 2 = 3</math>, etc. Patterns of known facts, e.g. <math>9 - 6 = 3</math>, so we know <math>39 - 6 = 33</math>, <math>69 - 6 = 63</math>, <math>89 - 6 = 83</math> Bridge ten, e.g. <math>52 - 6</math> as 52 subtract 2 then subtract 4 more</p>  <p><b>Counting up</b> Find a difference between two numbers on a line, e.g. <math>51 - 47</math></p>



# Fritwell C of E Primary School - Calculation Policy October 2015

	Year 3	Year 4
Mental Subtraction	<p><b>Taking away</b>            Use place value to subtract, e.g. <math>348 - 300</math> or <math>348 - 40</math> or <math>348 - 8</math>            Taking away multiples of 10, 100 and £1, e.g. <math>476 - 40 = 436</math>, <math>476 - 300 = 176</math>, <math>£4.76 - £2 = £2.76</math>            Partitioning, e.g. <math>68 - 42</math> as <math>60 - 40</math> and <math>8 - 2</math> or <math>£6.84 - £2.40</math> as <math>£6 - £2</math> and <math>80p - 40p</math>            Count back in hundreds, tens then ones, e.g. <math>763 - 121</math> as <math>763 - 100</math> (663) then subtract 20 (643) then subtract 1 (642)            Subtract near multiples, e.g. <math>648 - 199</math> or <math>86 - 39</math></p> <p><b>Counting up</b>             Find a difference between two numbers by counting up from the smaller to the larger, e.g. <math>121 - 87</math></p>  <p><b>Using number facts</b>            Number bonds to 100, e.g. <math>100 - 35 = 65</math>, <math>100 - 48 = 52</math>, etc.</p>	<p><b>Taking away</b>            Use place value to subtract, e.g. <math>4748 - 4000</math> or <math>4748 - 8</math>, etc.            Take away multiples of 10, 100, 1000, £1, 10p or 0.1, e.g. <math>8392 - 50</math> or <math>6723 - 3000</math> or <math>£3.74 - 30p</math> or <math>5.6 - 0.2</math>            Partitioning, e.g. <math>£5.87 - £3.04</math> as <math>£5 - £3</math> and <math>7p - 4p</math> or <math>7493 - 2020</math> as <math>7000 - 2000</math> and <math>90 - 20</math>            Count back, e.g. <math>6482 - 1301</math> as <math>6482 - 1000</math> then <math>- 300</math> then <math>- 1</math> (5181)            Subtract near multiples, e.g. <math>3522 - 1999</math> or <math>£34.86 - £19.99</math></p> <p><b>Counting up</b>            Find a difference between two numbers by counting up from the smaller to the larger, e.g. <math>506 - 387</math></p>  <p><b>Using number facts</b>            Number bonds to 10, 100 and derived facts, e.g. <math>100 - 76 = 24</math>, <math>1.0 - 0.6 = 0.4</math>            Number bonds to £1 and £10, e.g. <math>£1.00 - 86p = 14p</math> or <math>£10 - £3.40 = £6.60</math></p>
	<p>Develop counting up subtraction</p>  <p>Use counting up subtraction to find change from £1 and £10</p>  <p>Recognise complements of any fraction to 1, e.g. <math>1 - \frac{1}{4} = \frac{3}{4}</math> or <math>1 - \frac{2}{3} = \frac{1}{3}</math></p>	<p>Expanded column subtraction      Begin to use compact column subtraction</p> <div style="display: flex; justify-content: space-around;"> <div> <math display="block">\begin{array}{r} 600 \\ 700 \\ - 300 \\ \hline 300 \end{array}</math> </div> <div> <math display="block">\begin{array}{r} 110 \\ 20 \\ - 50 \\ \hline 60 \end{array}</math> </div> <div> <math display="block">\begin{array}{r} 16 \\ 8 \\ - 8 \\ \hline 0 \end{array}</math> </div> </div> <p>Use counting up subtraction to find change from £10, £20, £50 and £100</p>  <p>Subtract like fractions, e.g. <math>\frac{3}{8} - \frac{1}{8} = \frac{2}{8}</math></p>

# Fritwell C of E Primary School - Calculation Policy October 2015

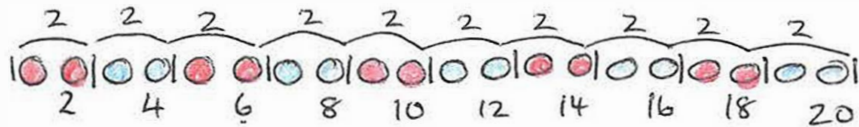

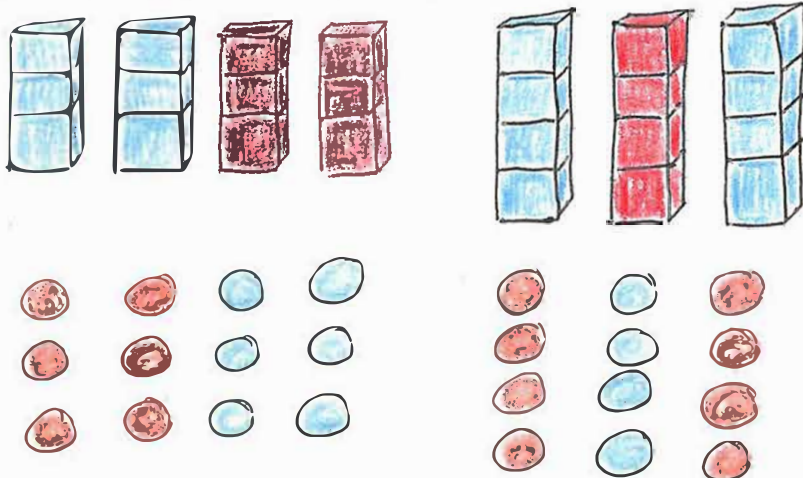

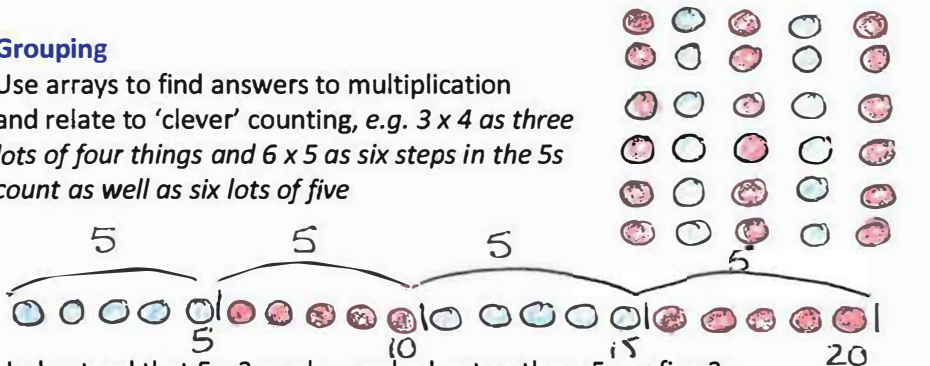
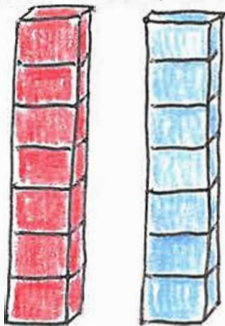
	Year 5	Year 6
Mental Subtraction	<p><b>Taking away</b>            Use place value to subtract decimals, e.g. <math>4.58 - 0.08</math> or <math>6.26 - 0.2</math>, etc.            Take away multiples of powers of 10, e.g. <math>15,672 - 300</math> or <math>4.82 - 2</math> or <math>2.71 - 0.5</math> or <math>4.68 - 0.02</math>            Partition or count back, e.g. <math>3964 - 1051</math> or <math>5.72 - 2.01</math>            Subtract near multiples, e.g. <math>86,456 - 9999</math> or <math>3.58 - 1.99</math></p> <p><b>Counting up</b>            Find a difference between two numbers by counting up from the smaller to the larger, e.g. <math>2009 - 869</math></p>  <p>Find change using shopkeepers' addition, e.g. buy toy for £6.89 using £10</p>  <p><b>Using number facts</b>            Derived facts from number bonds to 10 and 100, e.g. <math>2 - 0.45</math> using <math>45 + 55 = 100</math> or <math>3.00 - 0.86</math> using <math>86 + 14 = 100</math></p>  <p>Number bonds to £1, £10 and £100, e.g. <math>£4.00 - £3.86p = 14p</math> or <math>£100 - £66</math> using <math>66 + 34 = £100</math></p>	<p><b>Taking away</b>            Use place value to subtract decimals, e.g. <math>7.782 - 0.08</math> or <math>16.263 - 0.2</math>, etc.            Take away multiples of powers of 10, e.g. <math>132,956 - 400</math> or <math>686,109 - 40,000</math> or <math>7.823 - 0.5</math>            Partition or count back, e.g. <math>3964 - 1051</math> or <math>5.72 - 2.01</math>            Subtract near multiples, e.g. <math>360,078 - 99,998</math> or <math>12.831 - 0.99</math></p> <p><b>Counting up</b>            Count up to subtract numbers from multiples of 10, 100, 1000, 10,000            Find a difference between two decimal numbers by counting up from the smaller to the larger, e.g. <math>1.2 - 0.87</math></p>  <p><b>Using number facts</b>            Derived facts from number bonds to 10 and 100, e.g. <math>0.1 - 0.075</math> using <math>75 + 25 = 100</math> or <math>5 - 0.65</math> using <math>65 + 35 = 100</math></p>  <p>Number bonds to £1, £10 and £100, e.g. <math>£7.00 - £4.37</math> or <math>£100 - £66.20</math> using <math>20p + 80p = £1</math> and <math>£67 + £33 = £100</math>.</p>



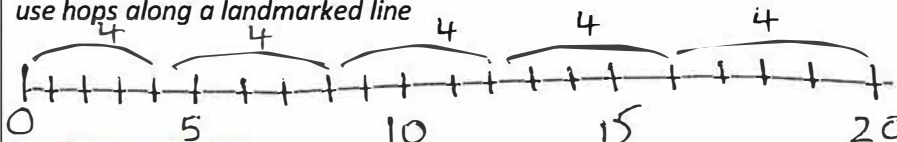
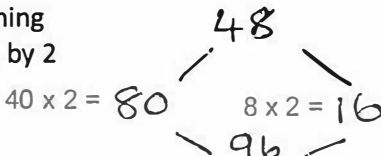
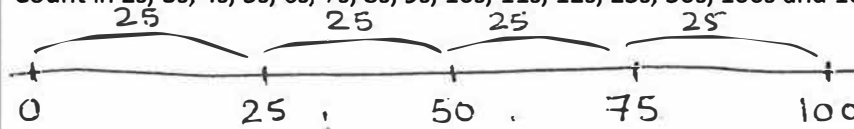
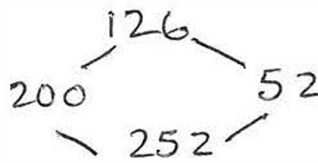
# Fritwell C of E Primary School - Calculation Policy October 2015

	Year 5	Year 6
Written Subtraction	<p>Compact column subtraction for numbers with up to 5 digits</p> $  \begin{array}{r}  01513114 \\  \cancel{1} \cancel{5} \cancel{3} \cancel{2} \cancel{4} \\  - \quad 8516 \\  \hline  7808  \end{array}  $	<p>Compact column subtraction for large numbers</p> $  \begin{array}{r}  214715 \\  \cancel{2} \cancel{1} \cancel{4} \cancel{6} \cancel{8} \cancel{5} \\  - \quad 16458 \\  \hline  18227  \end{array}  $
	<p>Continue to use counting up subtraction for subtractions involving money, including finding change or, e.g. £50 - £28.76</p> <p> <math>28.76 \xrightarrow{24p} 29 \xrightarrow{£1} 30 \xrightarrow{£20} 50</math> </p>	<p>Use counting up subtraction when dealing with money, e.g. £100 - £78.56 or £45.23 - £27.57</p> <p> <math>78.56 \xrightarrow{44p} 79 \xrightarrow{£1} 80 \xrightarrow{£20} 100</math> </p>
	<p>Use counting up subtraction to subtract decimal numbers, e.g. 4.2 - 1.74</p> <p> <math>1.74 \xrightarrow{0.06} 1.80 \xrightarrow{0.2} 2.0 \xrightarrow{2.2} 4.2</math> </p>	<p>Use counting up subtraction to subtract decimal numbers, e.g. 13.1 - 2.37</p> <p> <math>2.37 \xrightarrow{0.13} 2.50 \xrightarrow{0.50} 3.00 \xrightarrow{10.1} 13.1</math> </p>
	<p>Subtracting fractions with like denominators, e.g. <math>1\frac{1}{8} - \frac{3}{8}</math> as <math>1\frac{2}{8} - \frac{3}{8}</math> or <math>\frac{10}{8} - \frac{3}{8} = \frac{7}{8}</math></p>	<p>Subtracting fractions with unlike denominators, e.g. <math>1\frac{1}{4} - \frac{2}{3}</math> as <math>1\frac{3}{12} - \frac{8}{12}</math> or <math>\frac{15}{12} - \frac{8}{12} = \frac{7}{12}</math></p>

# Fritwell C of E Primary School - Calculation Policy October 2015

	Year 1	Year 2
Mental Multiplication	<p><b>Counting in steps ('Clever' counting)</b> Count in 2s and 10s</p>  <p><b>Doubling and halving</b> Find doubles to double 6 using fingers</p>  <p><b>Grouping</b> Begin to use visual and concrete arrays and 'sets of' objects to find the answers to '3 lots of 4' or '2 lots of 5', etc.</p> 	<p><b>Counting in steps ('Clever' counting)</b> Count in 2s, 5s and 10s</p>  <p>Begin to count in 3s</p> <p><b>Doubling and halving</b> Begin to know doubles of multiples of 5 to 100, e.g. double 35 is 70</p> <p><b>Grouping</b> Use arrays to find answers to multiplication and relate to 'clever' counting, e.g. <math>3 \times 4</math> as three lots of four things and <math>6 \times 5</math> as six steps in the 5s count as well as six lots of five</p>  <p>Understand that <math>5 \times 3</math> can be worked out as three 5s or five 3s</p> <p><b>Using number facts</b> Know doubles to double 20</p> <p>Double 7 = 14</p>  <p>Start learning 2x, 5x, 10x tables, relating these to 'Clever counting' in 2s, 5s, and 10s, e.g. <math>5 \times 10 = 50</math>, and 10, 20, 30, 40, 50 is five steps in the tens count</p>

# Fritwell C of E Primary School - Calculation Policy October 2015

	Year 3	Year 4																																															
Mental Multiplication	<p><b>Counting in steps ('Clever' counting)</b> Count in 2s, 3s, 4s, 5s, 8s and 10s, e.g. colour the multiples on a 1-100 grid or use hops along a landmarked line</p>  <p><b>Doubling and halving</b> Find doubles to double 50 using partitioning Use doubling as a strategy in multiplying by 2 E.g. 18 x 2 is double 18 (36)</p>  <p><b>Grouping</b> Recognise that multiplication is commutative, e.g. 4 x 8 ≡ 8 x 4 Multiply multiples of 10 by single digit numbers, e.g. 30 x 8 = 240 Multiply friendly 2-digit numbers by single digit numbers, e.g. 13 x 4</p> <p><b>Using number facts</b> Know doubles to 20 and doubles of multiples of 5 to 100, e.g. double 45 is 90 Know doubles of multiples of 5 to 100, e.g. double 85 is 170 Know 2x, 3x, 4x, 5x, 8x, 10x tables facts</p>	<p><b>Counting in steps – sequences</b> Count in 2s, 3s, 4s, 5s, 6s, 7s, 8s, 9s, 10s, 11s, 12s, 25s, 50s, 100s and 1000s</p>  <p><b>Doubling and halving</b> Find doubles to double 100 and beyond using partitioning Begin to double amounts of money. E.g. £3.50 doubled is £7 Use doubling as a strategy in multiplying by 2, 4 and 8, e.g. 34 x 4 = double 34 (68) doubled again (136)</p>  <p><b>Grouping</b> Use partitioning to multiply 2-digit numbers by single-digit numbers Multiply multiples of 100 by single digit numbers using tables facts, e.g. 400 x 8 = 3200 Multiply using near multiples by rounding, e.g. 24 x 19 as (24 x 20) – 24</p> <p><b>Using number facts</b> - Know times tables up to 12 x 12</p>																																															
	Written Multiplication	<p>Build on partitioning to develop grid multiplication</p> <table border="1" data-bbox="232 1059 546 1179"><tr><td>x</td><td>20</td><td>3</td></tr><tr><td>4</td><td>80</td><td>12</td></tr></table> <p>= 92</p>	x	20	3	4	80	12	<p>Use grid multiplication to multiply 3-digit by 1-digit numbers</p> <table border="1" data-bbox="1554 979 2069 1059"><tr><td>x</td><td>200</td><td>50</td><td>3</td></tr><tr><td>6</td><td>1200</td><td>300</td><td>18</td></tr></table> <p>= 1518</p> <p>Use a vertical written algorithm (ladder) to multiply 3-digit numbers by 1-digit numbers</p> <table border="1" data-bbox="1554 1121 1653 1337"><tr><td>2</td><td>5</td><td>3</td></tr><tr><td>x</td><td>6</td><td></td></tr><tr><td>1</td><td>2</td><td>0</td></tr><tr><td>3</td><td>0</td><td>0</td></tr><tr><td>1</td><td>8</td><td></td></tr><tr><td>1</td><td>5</td><td>1</td></tr><tr><td>8</td><td></td><td></td></tr></table> <p>Use grid multiplication to multiply 2-digit numbers by 2-digit numbers</p> <table border="1" data-bbox="1756 1243 2103 1394"><tr><td>x</td><td>40</td><td>6</td></tr><tr><td>10</td><td>400</td><td>60</td></tr><tr><td>8</td><td>320</td><td>48</td></tr><tr><td></td><td>720</td><td>108</td></tr></table> <p>= 828</p>	x	200	50	3	6	1200	300	18	2	5	3	x	6		1	2	0	3	0	0	1	8		1	5	1	8			x	40	6	10	400	60	8	320	48		720
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	720	108																																															



	Year 5	Year 6
Mental Multiplication	<p><b>Doubling and halving</b> Double amounts of money using partitioning, e.g. £6.73 doubled is double £6 (£12) plus double 73p (£1.46) Use doubling and halving as a strategy in multiplying by 2, 4, 8, 5 and 20. E.g. <math>58 \times 5 = \frac{1}{2}</math> of 58 (29) <math>\times 10</math> (290)</p> <p><b>Grouping</b> Multiply decimals by 10, 100, 1000, e.g. <math>3.4 \times 100 = 340</math> Use partitioning to multiply friendly 2-digit and 3-digit numbers by single-digit numbers. E.g. <math>402 \times 6</math> as <math>400 \times 6</math> (2400) and <math>2 \times 6</math> (12)</p> <p>Use partitioning to multiply decimal numbers by single-digit numbers, e.g. <math>4.5 \times 3</math> as <math>(4 \times 3) + (4 \times 0.5)</math> Multiply using near multiples by rounding, e.g. <math>32 \times 29</math> as <math>(32 \times 30) - 32</math></p> <p><b>Using number facts</b> Use times tables facts up to <math>12 \times 12</math> to multiply multiples of the multiplier, e.g. <math>4 \times 6 = 24</math> so <math>40 \times 6 = 240</math> and <math>400 \times 6 = 2400</math> Know square numbers and cube numbers</p>	<p><b>Doubling and halving</b> Double decimal numbers with up to 2-places using partitioning, e.g. 36.73 doubled is double 36 (72) plus double 0.73 (1.46)</p> <p>Use doubling and halving as strategies in mental multiplication</p> <p><b>Grouping</b> Use partitioning as a strategy in mental multiplication, as appropriate, e.g. <math>3060 \times 4</math> as <math>(3000 \times 4) + (60 \times 4)</math> or <math>8.4 \times 8</math> as <math>8 \times 8</math> (64) and <math>0.4 \times 8</math> (3.2) Use factors in mental multiplication, e.g. <math>421 \times 6</math> as <math>421 \times 3</math> (1263) doubled (2526) or <math>3.42 \times 5</math> as half of <math>(3.42 \times 10)</math> Multiply decimal numbers using near multiples by rounding, e.g. <math>4.3 \times 19</math> as <math>4.3 \times 20</math> (86 – 4.3)</p> <p><b>Using number facts</b> Use times tables facts up to <math>12 \times 12</math> in mental multiplication of large numbers or numbers with up to two decimal places, e.g. <math>6 \times 4 = 24</math> and <math>0.06 \times 4 = 0.24</math></p>
	<p>Handwritten diagrams for Year 5:</p> <ul style="list-style-type: none"> <li>£6.73 partitioned into £12 and £1.46, which sum to £13.46.</li> <li>402 partitioned into 2400 and 12, which sum to 2412.</li> </ul>	<p>Handwritten diagram for Year 6:</p> <ul style="list-style-type: none"> <li>36.73 partitioned into 72.00 and 1.46, which sum to 73.46.</li> </ul>
Written Multiplication	<p>Short multiplication of 2-digit, 3-digit and 4-digit numbers by 1-digit numbers</p> $\begin{array}{r} 387 \\ \times 6 \\ \hline 54 \end{array}$ <p>Long multiplication of 2-digit, 3-digit and 4-digit numbers by teen numbers</p> $\begin{array}{r} 2322 \\ \times 11 \\ \hline 2322 \\ 2322 \\ \hline 25542 \end{array}$ <p>Grid multiplication of numbers with up to 2 decimal places by single digit numbers</p> $\begin{array}{r} 387 \\ \times 14 \\ \hline 3870 \\ 15348 \\ \hline 5418 \end{array}$ <p>Multiplying fractions by single digit numbers E.g. <math>\frac{3}{4} \times 6 = \frac{18}{4}</math> which is <math>4\frac{2}{4} = 4\frac{1}{2}</math></p>	<p>Short multiplication of 2-digit, 3-digit and 4-digit numbers by 1-digit numbers</p> $\begin{array}{r} 3875 \\ \times 6 \\ \hline 543 \end{array}$ <p>Long multiplication of 2-digit, 3-digit and 4-digit numbers by 2-digit numbers</p> $\begin{array}{r} 23250 \\ \times 11 \\ \hline 23250 \\ 23250 \\ \hline 255750 \end{array}$ <p>Short multiplication of decimal numbers using <math>\times 100</math> and <math>\div 100</math>, e.g. <math>13.72 \times 6</math> as <math>1372 \times 6 \div 100</math></p> <p>Short multiplication of money, £13.72 <math>\times 6</math></p> <p>Grid multiplication of numbers with up to 2 decimal places by single digit numbers</p> <p>Multiplying proper and improper fractions, e.g. <math>\frac{3}{4} \times \frac{2}{3}</math></p>
	NB Grid multiplication provides a default method for ALL children	NB Grid multiplication provides a default method for ALL children

Mental Division

Year 1

Counting in steps ('Clever' counting)

Count in 2s and 10s

Doubling and halving

Find half of even numbers up to 12 including realising that it is hard to halve an odd number

Grouping

Begin to use visual and concrete arrays and 'sets of' objects to find the answers to 'how many towers of 3 can I make with 12 cubes?'

Sharing

Begin to find half of a quantity using sharing, e.g. half of 16 cubes by giving one each repeatedly to two children

Year 2

Counting in steps ('Clever' counting)

Count in 2s, 5s and 10s

Doubling and halving

Find half of numbers up to 40, including realising that half of an odd number gives a remainder of 1 or an answer containing a  $\frac{1}{2}$

Begin to know half of multiples of 10 to 100, e.g. half of 70 is 35

Grouping

Relate division to multiplication by using arrays or towers of cubes to find answers to division, e.g. how many towers of five cubes can I make from 20 cubes as  $\square \times 5 = 20$  and also as  $20 \div 5 = ?$

Relate to division to 'clever' counting and hence to multiplication, e.g. how many 5s do I count to get to 20?

Sharing

Begin to find half or a quarter of a quantity using sharing, e.g.  $\frac{1}{4}$  of 16 cubes by sorting the cubes into four piles

Find  $\frac{1}{4}$ ,  $\frac{1}{2}$ ,  $\frac{3}{4}$  of small quantities

Using number facts

Know halves of even numbers to 24

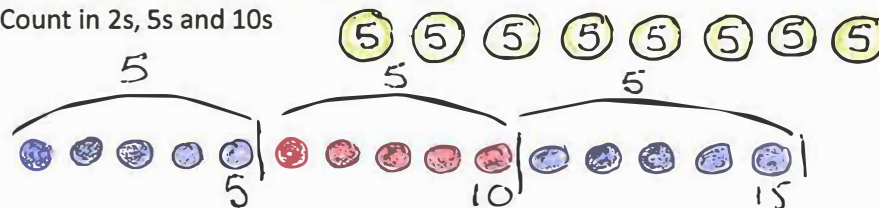
Know  $2x$ ,  $5x$  and  $10x$  division facts

Begin to know  $3x$  division facts

## Year 2

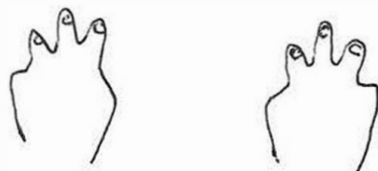
### Counting in steps ('Clever' counting)

### Count in 2s, 5s and 10s



## Doubling and halving

Find half of numbers up to 40, including realising that half of an odd number gives a remainder of 1 or an answer containing a  $\frac{1}{2}$   
Begin to know half of multiples of 10 to 100, *e.g. half of 70 is 35*



## Grouping

Relate division to multiplication by using arrays or towers of cubes to find answers to division, e.g. how many towers of five cubes can I make from 20 cubes as  $\square \times 5 = 20$  and also as  $20 \div 5 = ?$

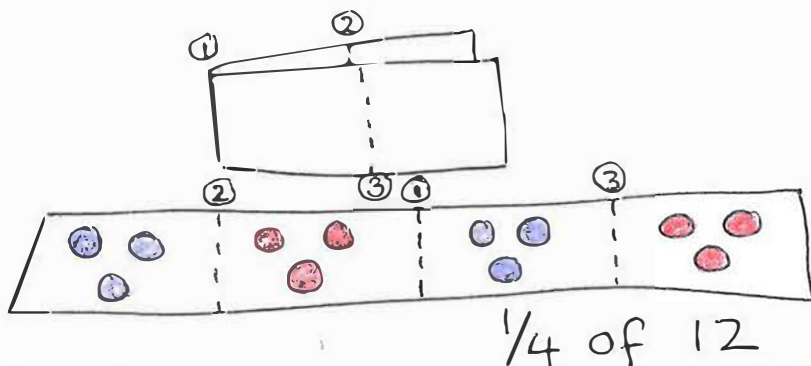


Relate to division to 'clever' counting and hence to multiplication, *e.g. how many 5s do I count to get to 20?*

## Sharing

Begin to find half or a quarter of a quantity using sharing, e.g.  $\frac{1}{4}$  of 16 cubes by sorting the cubes into four piles

Find  $\frac{1}{4}$ ,  $\frac{1}{2}$ ,  $\frac{3}{4}$  of small quantities


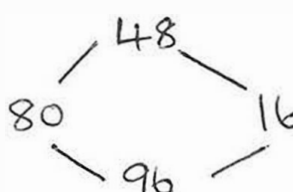
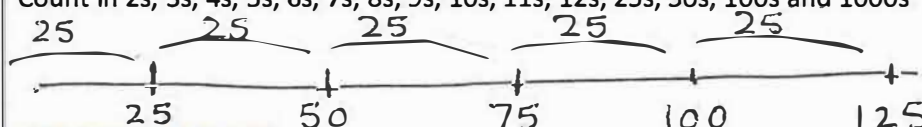


### Using number facts

Know halves of even numbers to 24  
Know  $2x$ ,  $5x$  and  $10x$  division facts  
Begin to know  $3x$  division facts



# Fritwell C of E Primary School - Calculation Policy October 2015

	Year 3	Year 4
Mental Division	<p><b>Counting in steps ('Clever' counting)</b> Count in 2s, 3s, 4s, 5s, 8s and 10s by colouring numbers on the 1-100 grid or using a landmarked line</p>  <p><b>Doubling and halving</b> Find half of even numbers to 100 using partitioning. Use halving as a strategy in dividing by 2. <i>E.g. <math>36 \div 2</math> is half of 36</i></p>  <p><b>Grouping</b> Recognise that division is not commutative, <i>e.g. <math>16 \div 8</math> does not equal <math>8 \div 16</math></i> Relate division to multiplications 'with holes in', <i>e.g. <math>\square \times 5 = 30</math> is the same calculation as <math>30 \div 5 = ?</math> thus we can count in 5s to find the answer</i> Divide multiples of 10 by single digit numbers, <i>e.g. <math>240 \div 8 = 30</math></i></p> <p><b>Using number facts</b> Know halves of even numbers to 40 Know halves of multiples of 10 to 200, <i>e.g. half of 170 is 85</i> Know 2x, 3x, 4x, 5x, 8x, 10x division facts Use division facts to find unit and simple non-unit fractions of amounts within the times tables, <i>e.g. <math>\frac{3}{4}</math> of 48 is <math>3 \times (48 \div 4)</math></i></p>	<p><b>Counting in steps – sequences</b> Count in 2s, 3s, 4s, 5s, 6s, 7s, 8s, 9s, 10s, 11s, 12s, 25s, 50s, 100s and 1000s</p>  <p><b>Doubling and halving</b> Find halves of even numbers to 200 and beyond using partitioning. Begin to half amounts of money. <i>E.g. £9 halved is £4.50</i> Use halving as a strategy in dividing by 2, 4 and 8, <i>e.g. <math>164 \div 4</math> is half of 164 (82) halved again (41)</i></p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p><math>45 \div 3 = \square</math></p> <p><math>\square \times 3 = 45</math></p> <p><math>10 \times 3 = 30</math></p> <p style="text-align: right;">15</p> <p><math>5 \times 3 = 15</math></p> </div> <p><b>Grouping</b> Use multiples of 10 times the divisor to divide by number <math>\leq 9</math> above the tables facts, <i>e.g. <math>45 \div 3</math></i> Divide multiples of 100 by single digit numbers using division facts, <i>e.g. <math>3200 \div 8 = 400</math></i></p> <p><b>Using number facts</b> Know times tables up to <math>12 \times 12</math> and all related division facts Use division facts to find unit and non-unit fractions of amounts within the times tables, <i>e.g. <math>\frac{7}{8}</math> of 56 is <math>7 \times (56 \div 8)</math></i></p>
Written Division		<p>Written version of a mental method</p> <div style="border: 1px solid black; padding: 10px; margin-top: 10px;"> <p><math>\square \times 3 = 86</math>      <math>84 \div 3 = 28 \text{ r}2</math></p> <p><math>20 \times 3 = 60</math></p> <p style="text-align: right;">26</p> <p><math>8 \times 3 = 24</math></p> <p style="text-align: right;">2</p> </div>

# Fritwell C of E Primary School - Calculation Policy October 2015

	Year 5	Year 6
Mental Division	<p><b>Doubling and halving</b> Halve amounts of money using partitioning, e.g. half of £14.84 as half of £14 and half of 84p</p> <div><div>£14.84</div><div>£7</div><div>42p</div><div>£8.42p</div></div> <p>Use doubling and halving as a strategy in dividing by 2, 4, 8, 5 and 20, e.g. <math>115 \div 5</math> as double 115 (230) <math>\div 10</math></p> <p><b>Grouping</b> Divide numbers by 10, 100, 1000 to obtain decimal answers with up to three places, e.g. <math>340 \div 100 = 3.4</math>. Use the 10<sup>th</sup>, 20<sup>th</sup>, 30<sup>th</sup>... multiple of the divisor to divide friendly 2-digit and 3-digit numbers by single-digit numbers, e.g. <math>186 \div 6</math> as <math>30 \times 6</math> (180) and <math>1 \times 6</math> (6) Find unit &amp; non-unit fractions of large amounts, e.g. <math>\frac{3}{5}</math> of 265 is <math>3 \times (265 \div 5)</math></p> <p><b>Using number facts</b> Use division facts from the times tables up to 12 x 12 to divide multiples of powers of ten of the divisor, e.g. <math>3600 \div 9</math> using <math>36 \div 9</math> Know square numbers and cube numbers</p>	<p><b>Doubling and halving</b> Halve decimal numbers with up to 2-places using partitioning, e.g. half of 36.86 is half of 36 (18) plus half of 0.86 (0.43)</p> <div><div>£36.86</div><div>£18</div><div>43p</div><div>£18.43</div></div> <p>Use doubling and halving as strategies in mental division, e.g. <math>216 \div 4</math> is half of 216 (108) and half of 108 (54)</p> <p><b>Grouping</b> Use 10<sup>th</sup>, 20<sup>th</sup>, 30<sup>th</sup>, ... or 100<sup>th</sup>, 200<sup>th</sup>, 300<sup>th</sup>.... multiples of the divisor to divide large numbers, e.g. <math>378 \div 9</math> as <math>40 \times 9 = 360</math> and <math>2 \times 9 = 18</math> so the answer is 42 Use tests for divisibility, e.g. 135 divides by 3 as <math>1 + 3 + 5 = 9</math> and 9 is in the 3x table</p> <p><b>Using number facts</b> Use division facts from the times tables up to 12 x 12 to divide decimal numbers by single-digit numbers, e.g. <math>1.17 \div 3</math> is <math>\frac{1}{100}</math> of <math>117 \div 3</math> (0.39)</p>
	<p>Written version of a mental strategy for 3-digit <math>\div</math> 1 digit numbers</p> <p>Short division of 3-digit and 4-digit numbers by single-digit numbers</p> <div><div><div><div><math>\square \times 6 = 326</math></div><div><math>50 \times 6 = \underline{300}</math></div><div>26</div><div><math>4 \times 6 = \underline{24}</math></div><div>2</div><div>54 r2</div></div></div><div><div><math>326 \div 6 = 54 \text{ r}2</math></div></div></div> <div><div><div>1 2 6 4</div><div>6   7 1 5 3 8 2 4</div></div></div>	<p>Short division of 3-digit and 4-digit numbers by single-digit numbers</p> <div><div><div>1 2 6 4</div><div>6   7 1 5 3 8 2 4</div></div></div> <p>Long division of 3-digit and 4-digit numbers by two-digit numbers</p> <div><div><div><div>200 + 50 + 1</div><div>15   3 7 6 5</div><div><div><div><math>\underline{3000}</math></div><div>7 6 5</div><div><math>\underline{750}</math></div><div>1 5</div></div></div></div><div><div>15</div><div>30</div><div>45</div><div>60</div><div>75</div><div>90</div></div></div></div> <p>Divide fractions by whole numbers, e.g. <math>\frac{1}{4} \div 3 = \frac{1}{12}</math></p>
Written Division		