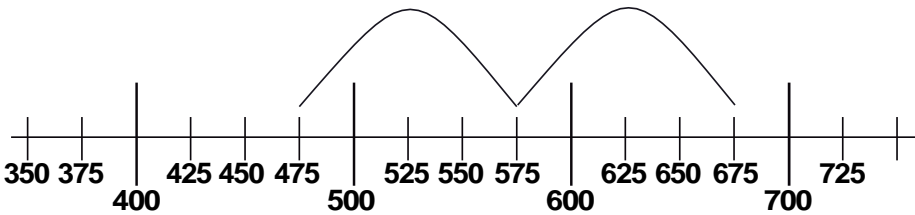
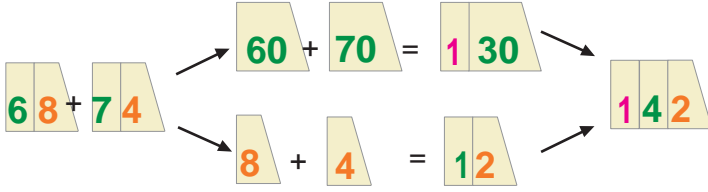
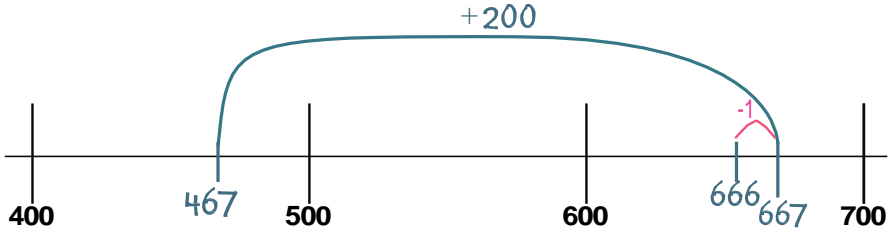
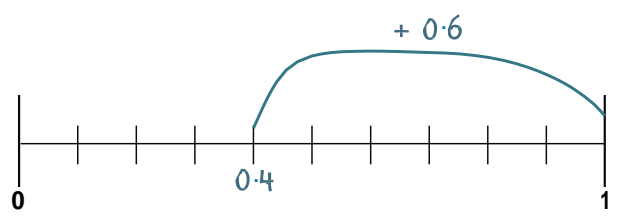
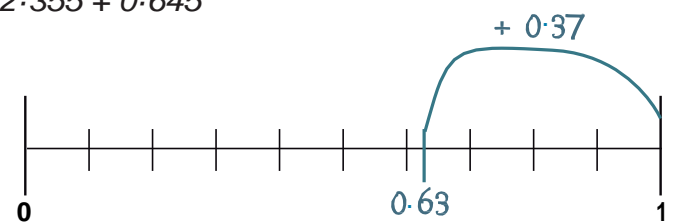


	Year 3	Year 4
Mental Addition	<p>Using place value Count in 100s e.g. Know $475 + 200$ as 475, 575, 675</p>  <p>Add multiples of 10, 100 and £1 e.g. $746 + 200$ e.g. $746 + 40$ e.g. $£6.34 + £5$ as $£6 + £5$ and 34p</p> <p>Partitioning e.g. $£8.50 + £3.70$ as $£8 + £3$ and $50p + 70p$ and combine the totals: $£11 + £1.20$ e.g. $347 + 36$ as 300 and $40 + 30$ and $7 + 6$ and combine the totals: $370 + 13 = 383$ e.g. $68 + 74$ as $60 + 70$ and $8 + 4$ and combine the totals: $130 + 12 = 142$</p> 	<p>Using place value Count in 1000s e.g. Know $3475 + 2000$ as 3475, 4475, 5475</p> <p>Partitioning e.g. $746 + 40$ e.g. $746 + 203$ as $700 + 200$ and 40 and $6 + 3$ e.g. $134 + 707$ as $100 + 700$ and 30 and $4 + 7$</p> <p>Counting on Add 2-digit numbers to 2-, 3- and 4-digit numbers by adding the multiple of 10 then the 1s e.g. $167 + 55$ as $167 + 50$ (217) + 5 = 222</p> <p>Add near multiples of 10, 100 and 1000 e.g. $467 + 199$ e.g. $3462 + 2999$</p>  <p>Count on to add 3-digit numbers and money e.g. $463 + 124$ as $463 + 100$ (563) + 20 (583) + 4 = 587 e.g. $£4.67 + £5.30$ as $£9.67 + 30p$</p>

	Year 3	Year 4
Written Addition	<p>Build on partitioning to develop expanded column addition with two 3-digit numbers e.g. $466 + 358$</p> $\begin{array}{r} 400 & 60 & 6 \\ + 300 & 50 & 8 \\ \hline 700 & 110 & 14 \end{array} = 824$	<p>Build on expanded column addition to develop compact column addition with larger numbers e.g. $1466 + 4868$</p> $\begin{array}{r} 1000 & 400 & 60 & 6 \\ 4000 & 800 & 60 & 8 \\ + 1000 & 100 & 10 & \\ \hline 6000 & 300 & 30 & 4 \end{array}$
	<p>Use expanded column addition where digits in a column add to more than the column value e.g. $466 + 358$</p> $\begin{array}{r} 400 & 60 & 6 \\ 300 & 50 & 8 \\ + 100 & 10 & \\ \hline 800 & 20 & 4 \end{array}$	<p>Compact column addition with larger numbers e.g. $5347 + 2286 + 1495$</p> $\begin{array}{r} 5347 \\ 2286 \\ + 1495 \\ \hline 9128 \end{array}$
	<p>Compact column addition with two or more 3-digit numbers or towers of 2-digit numbers e.g. $347 + 286 + 495$</p> $\begin{array}{r} 347 \\ 286 \\ + 495 \\ 21 \\ \hline 1128 \end{array}$	<p>Use expanded and compact column addition to add amounts of money Add like fractions e.g. $\frac{3}{8} + \frac{1}{8} + \frac{1}{8}$</p>
	<p>Compact column addition with 3- and 4-digit numbers Recognise like fractions that add to 1 e.g. $\frac{1}{4} + \frac{3}{4}$ e.g. $\frac{3}{5} + \frac{2}{5}$</p>	

	Year 5	Year 6																																																																																																				
Mental Addition	<p>Using place value Count in 0.1s, 0.01s e.g. <i>Know what 0.1 more than 0.51 is</i></p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="color: green;">10s</td> <td style="color: orange;">1s</td> <td>0.1s</td> <td>0.01s</td> </tr> <tr> <td></td> <td style="color: orange;">0</td> <td>5</td> <td>1</td> </tr> </table>	10s	1s	0.1s	0.01s		0	5	1	<p>Using place value Count in 0.1s, 0.01s, 0.001s e.g. <i>Know what 0.001 more than 6.725 is</i></p> <p>Partitioning e.g. <i>9.54 + 3.23 as 9 + 3, 0.5 + 0.2 and 0.04 + 0.03, to give 12.77</i></p>																																																																																												
	10s	1s	0.1s	0.01s																																																																																																		
		0	5	1																																																																																																		
	<p>Partitioning e.g. <i>2.4 + 5.8 as 2 + 5 and 0.4 + 0.8 and combine the totals: 7 + 1.2 = 8.2</i></p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td>0.1</td><td>0.2</td><td>0.3</td><td>0.4</td><td>0.5</td><td>0.6</td><td>0.7</td><td>0.8</td><td>0.9</td><td>1</td></tr> <tr><td>1.1</td><td>1.2</td><td>1.3</td><td>1.4</td><td>1.5</td><td>1.6</td><td>1.7</td><td>1.8</td><td>1.9</td><td>2</td></tr> <tr><td>2.1</td><td>2.2</td><td>2.3</td><td>2.4</td><td>2.5</td><td>2.6</td><td>2.7</td><td>2.8</td><td>2.9</td><td>3</td></tr> <tr><td>3.1</td><td>3.2</td><td>3.3</td><td>3.4</td><td>3.5</td><td>3.6</td><td>3.7</td><td>3.8</td><td>3.9</td><td>4</td></tr> <tr><td>4.1</td><td>4.2</td><td>4.3</td><td>4.4</td><td>4.5</td><td>4.6</td><td>4.7</td><td>4.8</td><td>4.9</td><td>5</td></tr> <tr><td>5.1</td><td>5.2</td><td>5.3</td><td>5.4</td><td>5.5</td><td>5.6</td><td>5.7</td><td>5.8</td><td>5.9</td><td>6</td></tr> <tr><td>6.1</td><td>6.2</td><td>6.3</td><td>6.4</td><td>6.5</td><td>6.6</td><td>6.7</td><td>6.8</td><td>6.9</td><td>7</td></tr> <tr><td>7.1</td><td>7.2</td><td>7.3</td><td>7.4</td><td>7.5</td><td>7.6</td><td>7.7</td><td>7.8</td><td>7.9</td><td>8</td></tr> <tr><td>8.1</td><td>8.2</td><td>8.3</td><td>8.4</td><td>8.5</td><td>8.6</td><td>8.7</td><td>8.8</td><td>8.9</td><td>9</td></tr> <tr><td>9.1</td><td>9.2</td><td>9.3</td><td>9.4</td><td>9.5</td><td>9.6</td><td>9.7</td><td>9.8</td><td>9.9</td><td>10</td></tr> </table>	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	4	4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.8	4.9	5	5.1	5.2	5.3	5.4	5.5	5.6	5.7	5.8	5.9	6	6.1	6.2	6.3	6.4	6.5	6.6	6.7	6.8	6.9	7	7.1	7.2	7.3	7.4	7.5	7.6	7.7	7.8	7.9	8	8.1	8.2	8.3	8.4	8.5	8.6	8.7	8.8	8.9	9	9.1	9.2	9.3	9.4	9.5	9.6	9.7	9.8	9.9	10	<p>Counting on Add two decimal numbers by adding the 1s, then the 0.1s/0.01s/0.001s e.g. <i>6.314 + 3.006 as 6.314 + 3 (9.314) + 0.006 = 9.32</i></p> <p>Add near multiples of 1 e.g. <i>6.345 + 0.999</i> e.g. <i>5.673 + 0.9</i></p> <p>Count on from large numbers e.g. <i>16 375 + 12 003 as 28 375 + 3</i></p>
	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1																																																																																												
	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2																																																																																												
	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3																																																																																												
	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	4																																																																																												
	4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.8	4.9	5																																																																																												
	5.1	5.2	5.3	5.4	5.5	5.6	5.7	5.8	5.9	6																																																																																												
6.1	6.2	6.3	6.4	6.5	6.6	6.7	6.8	6.9	7																																																																																													
7.1	7.2	7.3	7.4	7.5	7.6	7.7	7.8	7.9	8																																																																																													
8.1	8.2	8.3	8.4	8.5	8.6	8.7	8.8	8.9	9																																																																																													
9.1	9.2	9.3	9.4	9.5	9.6	9.7	9.8	9.9	10																																																																																													

	Year 5	Year 6
Mental Addition	<p>Counting on Add two decimal numbers by adding the 1s, then the 0.1s/0.01s e.g. $5.72 + 3.05$ as $5.72 + 3 (8.72) + 0.05 = 8.77$ Add near multiples of 1 e.g. $6.34 + 0.99$ e.g. $5.63 + 0.9$ Count on from large numbers e.g. $6834 + 3005$ as $9834 + 5$</p> <p>Using number facts Number bonds to 1 and to the next whole number e.g. $5.7 + 0.3$ e.g. $0.4 + 0.6$</p>  <p>Add to the next 10 from a decimal number e.g. $7.8 + 2.2 = 10$</p>	<p>Using number facts Number bonds to 1 and to the next multiple of 1 e.g. $0.63 + 0.37$ e.g. $2.355 + 0.645$</p>  <p>Add to the next 10 e.g. $4.62 + 5.38$</p>

	Year 5	Year 6
Written Addition	<p>Expanded column addition for money leading to compact column addition for adding several amounts of money e.g. £14.64 + £28.78 + £12.26</p> $ \begin{array}{r} \text{£}14 \text{ 60p 4p} \\ \text{£}28 \text{ 70p 8p} \\ + \text{£}12 \text{ 20p 6p} \\ \text{£}1 \text{ 10p} \\ \hline \text{£}55 \text{ 60p 8p} \end{array} $	<p>Compact column addition for adding several large numbers and decimal numbers with up to 2 decimal places Compact column addition with money e.g. £14.64 + £28.78 + £12.26</p> $ \begin{array}{r} \text{£}14.64 \\ + \text{£}28.78 \\ \text{£}12.26 \\ \hline \text{£}55.68 \end{array} $
	<p>Compact column addition to add pairs of 5-digit numbers Continue to use column addition to add towers of several larger numbers Use compact addition to add decimal numbers with up to 2 decimal places e.g. 15.68 + 27.86</p> $ \begin{array}{r} 15.68 \\ + 27.86 \\ \hline 43.54 \end{array} $	<p>Add unlike fractions, including mixed numbers</p> <p>- - - e.g. $\frac{1}{4} + \frac{2}{3} = \frac{11}{12}$ - - - e.g. $2 \frac{1}{4} + 1 \frac{1}{3} = 3 \frac{7}{12}$</p>
	<p>Add related fractions - - - e.g. $\frac{3}{4} + \frac{1}{8} = \frac{7}{8}$</p>	

Year 3

Taking away

Use place value to subtract

e.g. $348 - 300$

e.g. $348 - 40$

e.g. $348 - 8$



Take away multiples of 10, 100 and £1

e.g. $476 - 40 = 436$

e.g. $476 - 300 = 176$

e.g. $£4.76 - £2 = £2.76$

Partitioning

e.g. $68 - 42$ as $60 - 40$ and $8 - 2$

e.g. $£6.84 - £2.40$ as $£6 - £2$ and $80p - 40p$



Year 4

Taking away

Use place value to subtract

e.g. $4748 - 4000$



Take away multiples of 10, 100, 1000, £1, 10p or 0.1

e.g. $8392 - 50$

e.g. $6723 - 3000$

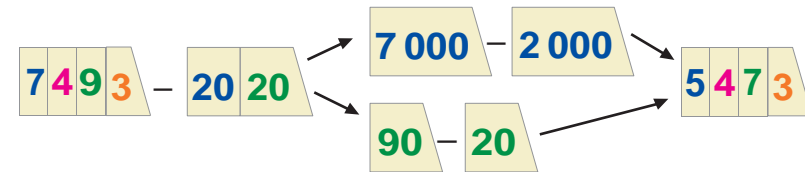
e.g. $£3.74 - 30p$

e.g. $5.6 - 0.2$

Partitioning

e.g. $£5.87 - £3.04$ as $£5 - £3$ and $7p - 4p$

e.g. $7493 - 2020$ as $7000 - 2000$ and $90 - 20$



Count back

e.g. $6482 - 1301$ as $6482 - 1000 (5482) - 300 (5182) - 1 = 5181$

Subtract near multiples of 10, 100, 1000 or £1

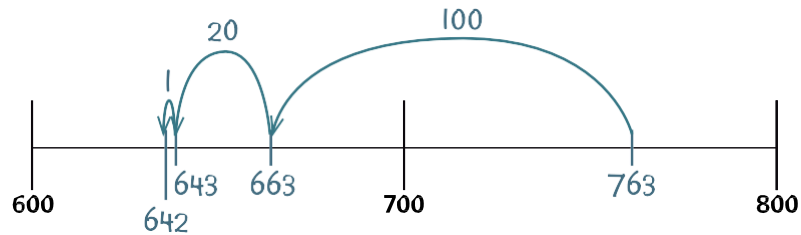
e.g. $3522 - 1999$

e.g. $£34.86 - £19.99$

Year 3

Count back in 100s, 10s then 1s

e.g. $763 - 121$ as $763 - 100$ (663) $- 20$ (643) $- 1 = 642$



Subtract near multiples of 10 and 100

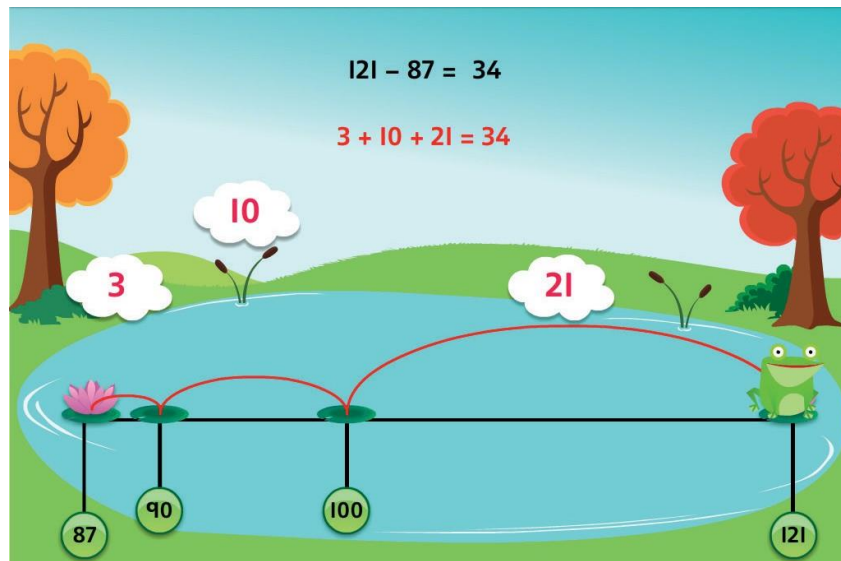
e.g. $648 - 199$

e.g. $86 - 39$

Counting up

Find a difference between two numbers by counting up from the smaller to the larger

e.g. $121 - 87$



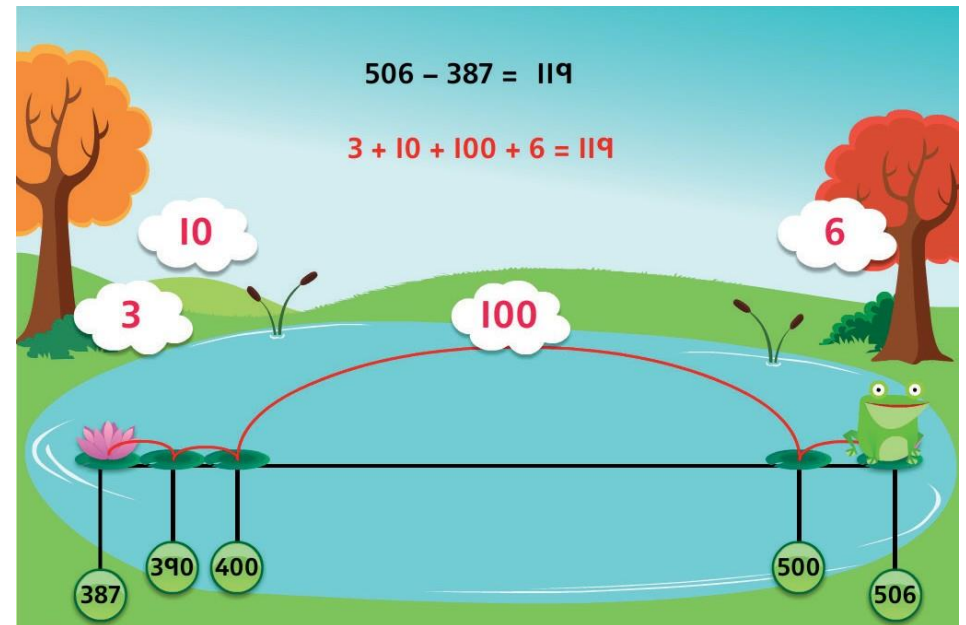
Year 4


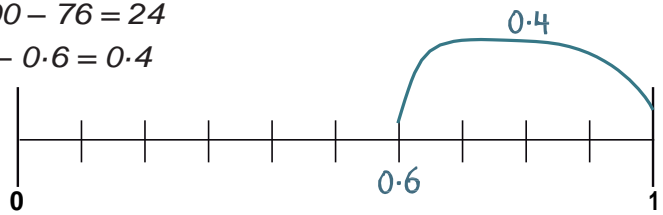
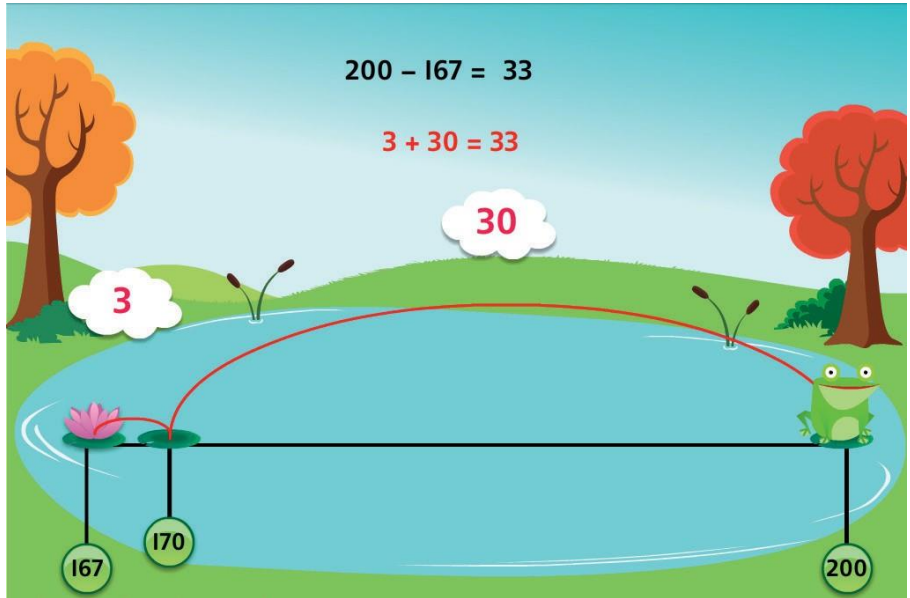
Counting up

Find a difference between two numbers by counting up from the smaller to the larger

e.g. $506 - 387$

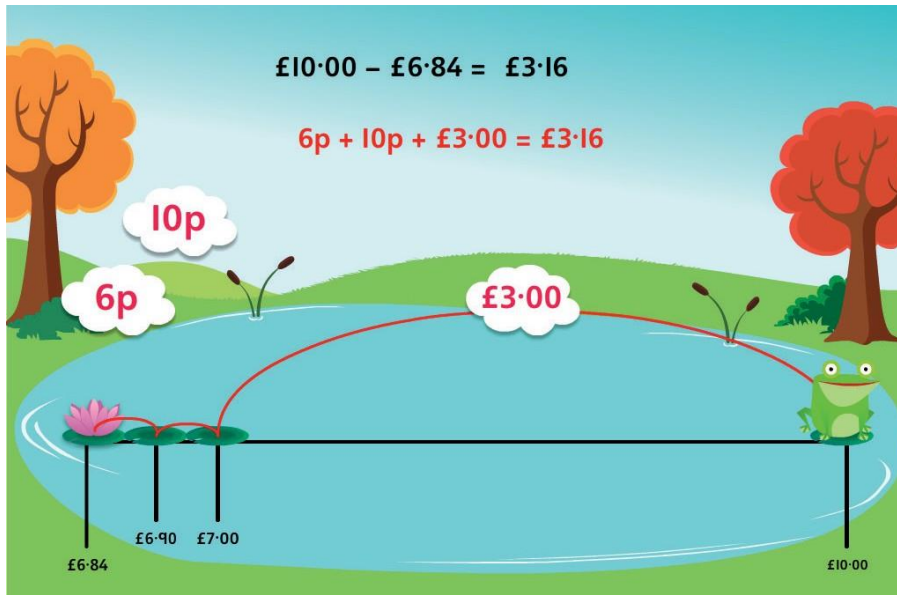
e.g. $4000 - 2693$



	Year 3	Year 4
Mental Subtraction	<p>Using number facts Know pairs which total each number to 20 e.g. $20 - 14 = 6$ Number bonds to 100 e.g. $100 - 48 = 52$ e.g. $100 - 35 = 65$</p>  <p>Subtract using number facts to bridge back through a 10 e.g. $42 - 5 = 42 - 2 (40) - 3 = 37$</p>	<p>Using number facts Number bonds to 10 and 100 and derived facts e.g. $100 - 76 = 24$ e.g. $1 - 0.6 = 0.4$</p>  <p>Number bonds to £1 and £10 e.g. $£1.00 - 86p = 14p$ e.g. $£10.00 - £3.40 = £6.60$</p>
Written Subtraction	<p>Develop counting up subtraction e.g. $200 - 167$</p> 	<p>Expanded column subtraction with 3- and 4-digit numbers e.g. $726 - 358$</p> $ \begin{array}{r} 600 \quad 110 \quad 16 \\ \cancel{700} \quad \cancel{20} \quad \cancel{8} \\ - 300 \quad 50 \quad 8 \\ \hline 300 \quad 60 \quad 8 \end{array} $ <p>Begin to develop compact column subtraction e.g. $726 - 358$</p> $ \begin{array}{r} 6 \quad 11 \quad 16 \\ \cancel{7} \quad \cancel{2} \quad \cancel{8} \\ - 3 \quad 5 \quad 8 \\ \hline 3 \quad 6 \quad 8 \end{array} $

Year 3

Use counting up subtraction to find change from £1, £5 and £10
 e.g. $£10.00 - £6.84$



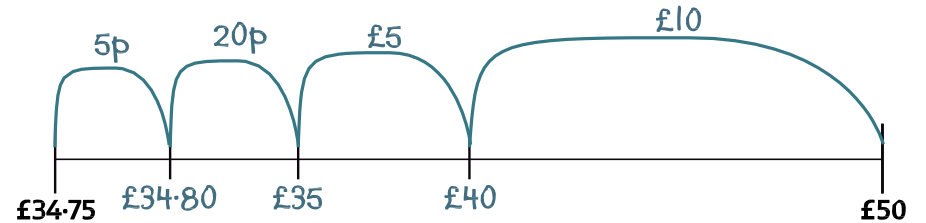
Recognise complements of any fraction to 1

- - e.g. $1 - 1/4 = 3/4$
- - e.g. $1 - 3/5 = 2/5$

Year 4

Use counting up subtraction to find change from £10, £20, £50 and £100

e.g. Buy a computer game for £34.75 using £50



Subtract like fractions

- - - e.g. $3/8 - 1/8 = 2/8$

Year 5

Taking away

Use place value to subtract decimals

e.g. $4.58 - 0.08$

e.g. $6.26 - 0.2$

Take away multiples of powers of 10

e.g. $15\ 672 - 300$

e.g. $4.82 - 2$ e.g. $2.71 - 0.5$

e.g. $4.68 - 0.02$

Partitioning or counting back

e.g. $3964 - 1051$

e.g. $5.72 - 2.01$

Subtract near multiples of 1, 10, 100, 1000, 10 000 or £1

e.g. $86\ 456 - 9999$

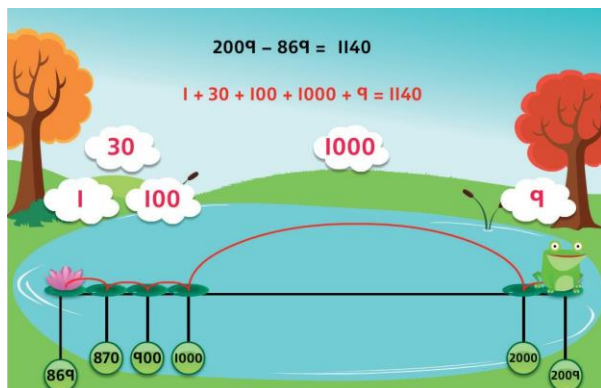
e.g. $3.58 - 1.99$

Counting up

Find a difference between two numbers by counting up from the smaller to the larger

e.g. $£12.05 - £9.59$

e.g. $2009 - 869$



Year 6

Taking away

Use place value to subtract decimals

e.g. $7.782 - 0.08$

e.g. $16.263 - 0.2$

Take away multiples of powers of 10

e.g. $132\ 956 - 400$

e.g. $686\ 109 - 40\ 000$

e.g. $7.823 - 0.5$

Partitioning or counting back

e.g. $3964 - 1051$

e.g. $5.72 - 2.01$

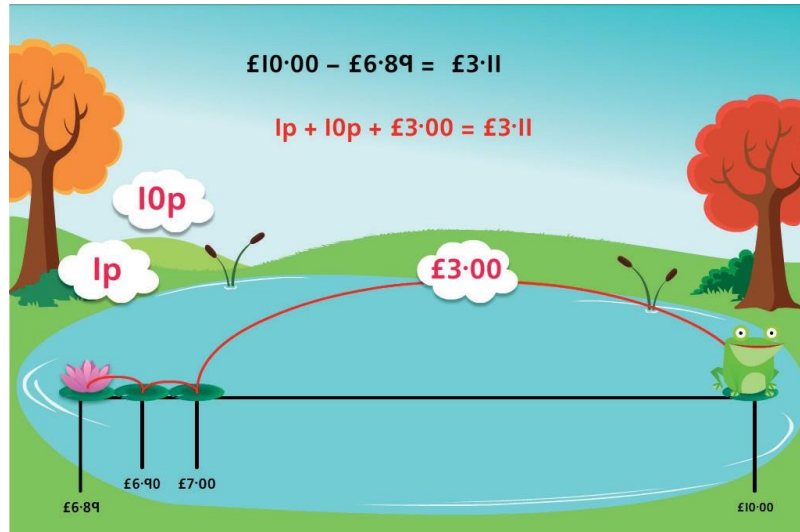
Subtract near multiples of powers of 10

e.g. $360\ 078 - 99\ 998$

e.g. $12.831 - 0.99$

Year 5

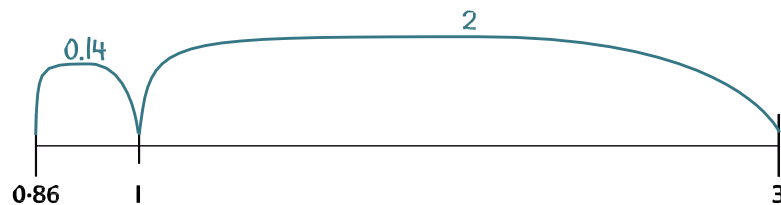
Find change using shopkeepers' addition
e.g. Buy a toy for £6.89 using £10.00



Find a difference between two amounts of money by counting up

Using number facts

Derived facts from number bonds to 10 and 100
e.g. $2 - 0.45$ using $45 + 55 = 100$
e.g. $3 - 0.86$ using $86 + 14 = 100$

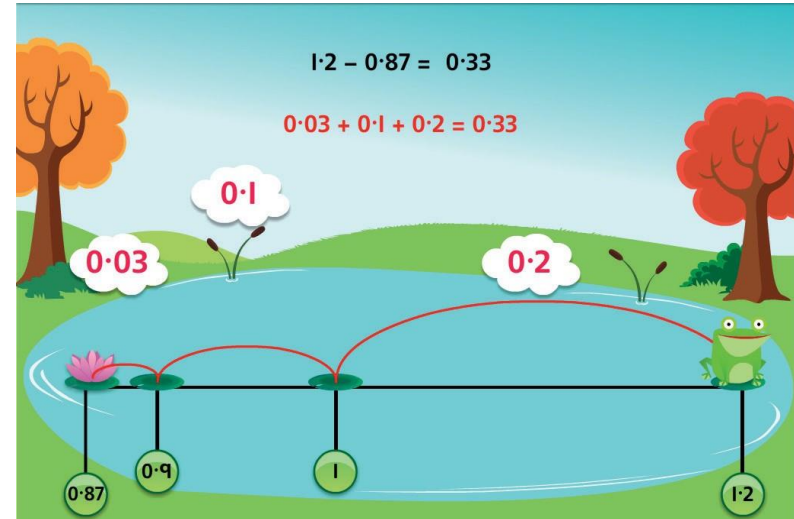


Number bonds to £1, £10 and £100
e.g. $£4.00 - £3.86$
e.g. $£100 - £66$ using $66 + 34 = 100$

Year 6

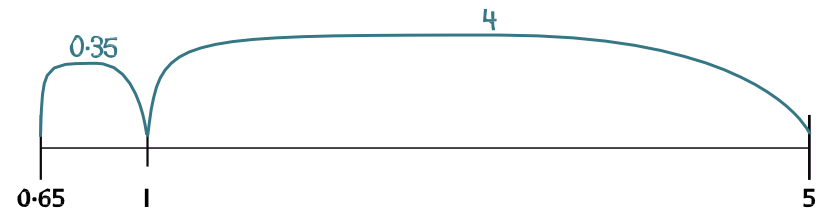
Counting up

Find a difference between two decimal numbers by counting up from the smaller to the larger
e.g. $1.2 - 0.87$



Using number facts

Derived facts from number bonds to 10 and 100
e.g. $0.1 - 0.075$ using $75 + 25 = 100$
e.g. $5 - 0.65$ using $65 + 35 = 100$



Number bonds to £1, £10 and £100
e.g. $£7.00 - £4.37$
e.g. $£100 - £66.20$ using $20p + 80p = £1$ and $£67 + £33 = £100$

Year 5

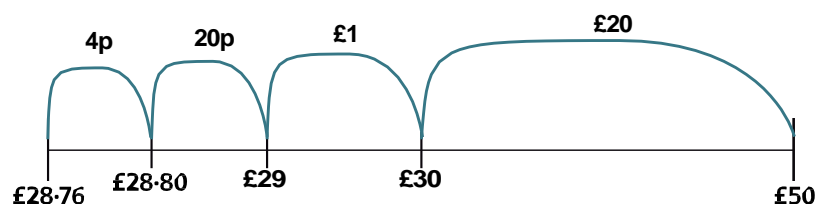
Compact column subtraction for numbers with up to 5 digits

e.g. $16\ 324 - 8516$

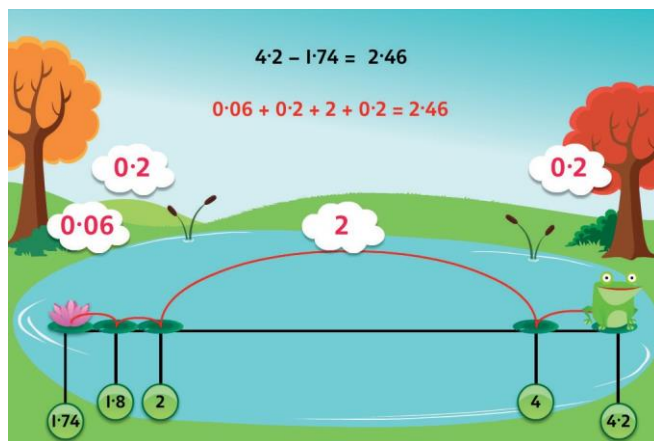
$$\begin{array}{r} 0\ 15\ 13\ 1\ 14 \\ \cancel{1}\ \cancel{6}\ \cancel{3}\ \cancel{2}\ \cancel{4} \\ -\quad 8\ 5\ 1\ 6 \\ \hline 7\ 8\ 0\ 8 \end{array}$$

Continue to use counting up subtraction for subtractions involving money, including finding change

e.g. $£50 - £28.76$



Use counting up subtraction to subtract decimal numbers



e.g. $4.2 - 1.74$

Subtract related fractions

- - - e.g. $\frac{3}{4} - \frac{1}{8} = \frac{5}{8}$

NB Counting up subtraction provides a default method for ALL children

Year 6

Compact column subtraction for large numbers

e.g. $34\ 685 - 16\ 458$

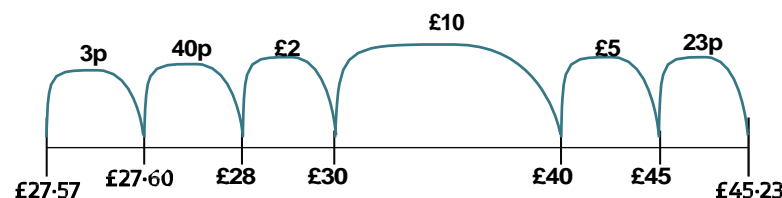
$$\begin{array}{r} 2\ 14\quad 7\ 15 \\ \cancel{3}\ \cancel{4}\ \cancel{6}\ \cancel{8}\ \cancel{5} \\ -\quad 1\ 6\ 4\ 5\ 8 \\ \hline 1\ 8\ 2\ 2\ 7 \end{array}$$

Use counting up for subtractions where the larger number is a multiple or near multiple of 1000 or 10000

Use counting up subtraction when dealing with money

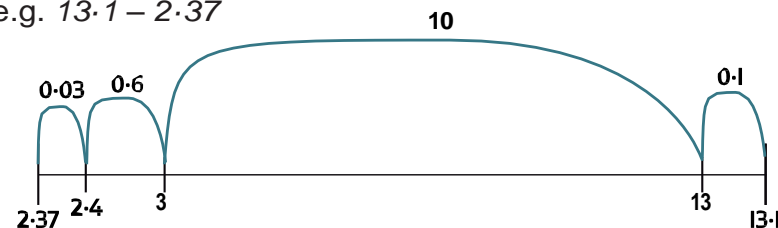
e.g. $£100 - £78.56$

e.g. $£45.23 - £27.57$



Use counting up subtraction to subtract decimal numbers

e.g. $13.1 - 2.37$



Subtract unlike fractions, including mixed numbers

- - - e.g. $\frac{3}{4} - \frac{1}{3} = \frac{5}{12}$
 - - - e.g. $2\ \frac{3}{4} - 1\ \frac{1}{3} = 1\ \frac{5}{12}$

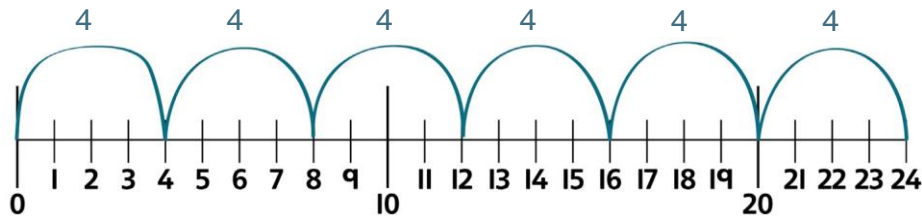
NB Counting up subtraction provides a default method for ALL children

Year 3

Counting in steps ('clever' counting)

Count in 2s, 3s, 4s, 5s, 8s and 10s

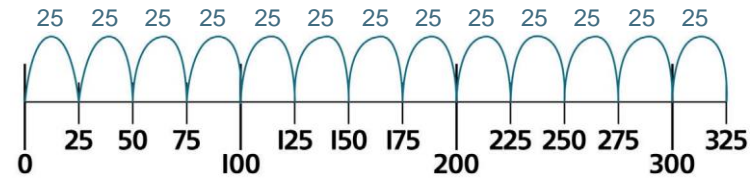
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100



Year 4

Counting in steps (sequences)

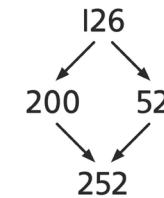
Count in 2s, 3s, 4s, 5s, 6s, 7s, 8s, 9s, 10s, 11s, 12s, 25s, 50s, 100s and 1000s



Doubling and halving

Find doubles to double 100 and beyond using partitioning

e.g. *double 126*



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

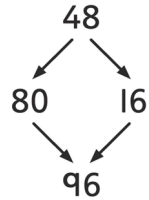
e.g. 34×4 is double 34 (68) doubled again = 136

Year 3

Doubling and halving

Find doubles of numbers to 50 using partitioning

e.g. *double 48*



Use doubling as a strategy in multiplying by 2

e.g. 18×2 is double $18 = 36$

Grouping

Recognise that multiplication is commutative

e.g. $4 \times 8 = 8 \times 4$

Multiply multiples of 10 by 1-digit numbers

e.g. $30 \times 8 = 240$

Multiply 'friendly' 2-digit numbers by 1-digit numbers

e.g. 13×4

Using number facts

Know doubles to double 20

e.g. *double 15 is 30*

Know doubles of multiples of 5 to 100

e.g. *double 85 is 170*

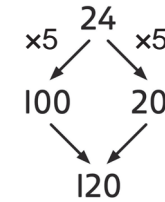
Know $\times 2, \times 3, \times 4, \times 5, \times 8, \times 10$ tables facts

Year 4

Grouping

Use partitioning to multiply 2-digit numbers by 1-digit numbers

e.g. 24×5



Multiply multiples of 100 and 1000 by 1-digit numbers using tables facts

e.g. $400 \times 8 = 3200$

Multiply near multiples by rounding e.g.

24×19 as $(24 \times 20) - 24 = 456$

Using number facts

Know times-tables up to 12×12

x	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144

Year 3

Build on partitioning to develop grid multiplication

e.g. 23×4

×	20	3	
4	80	12	= 92

Year 4

Use grid multiplication to multiply 3-digit numbers by 1-digit numbers

e.g. 253×6

×	200	50	3	
6	1200	300	18	= 1518

Use a vertical written algorithm (ladder) to multiply 3-digit numbers by 1-digit numbers

e.g. 253×6

$$\begin{array}{r}
 \\
 \\
 \times \\
 \hline
 1200 \leftarrow 6 \times 200 \\
 300 \leftarrow 6 \times 50 \\
 + 18 \leftarrow 6 \times 3 \\
 \hline
 1518
 \end{array}$$

Use grid multiplication to multiply 2-digit numbers by 2-digit numbers

e.g. 16×48

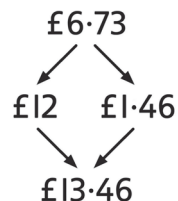
×	10	6	
40	400	240	= 640
8	80	48	= 128
			<hr/> 768

Year 5

Doubling and halving

Double amounts of money using partitioning

e.g. *double £6.73*



Use doubling and halving as a strategy in multiplying by 2, 4, 8, 5 and 20

e.g. 58×5 is half of 58×10 (580) = 290

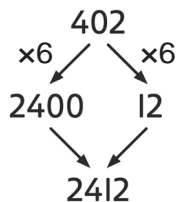
Grouping

Multiply whole numbers and decimals by 10, 100, 1000

e.g. $3.4 \times 100 = 340$

Use partitioning to multiply 'friendly' 2- and 3-digit numbers by 1-digit numbers

e.g. 402×6 as 400×6 (2400) and 2×6 (12) = 2412



Use partitioning to multiply decimal numbers by 1-digit numbers

e.g. 4.5×3 as 4×3 (12) and 0.5×3 (1.5) = 13.5

Multiply near multiples by rounding e.g.

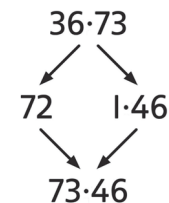
32×29 as $(32 \times 30) - 32 = 928$

Year 6

Doubling and halving

Double decimal numbers with up to 2 places using partitioning

e.g. *double 36.73*



Use doubling and halving as strategies in mental multiplication

Grouping

Use partitioning as a strategy in mental multiplication, as appropriate

e.g. 3060×4 as 3000×4 (12 000) and 60×4 (240) = 12 240

e.g. 8.4×8 as 8×8 (64) and 0.4×8 (3.2) = 67.2

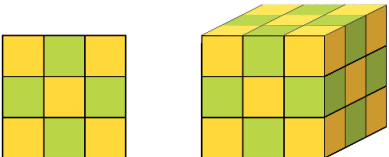
Use factors in mental multiplication

e.g. 421×6 as 421×3 (1263) doubled = 2526

e.g. 3.42×5 as half of $3.42 \times 10 = 17.1$

Multiply decimal numbers using near multiples by rounding

e.g. 4.3×19 as $(4.3 \times 20) - 4.3 = 81.7$

	Year 5	Year 6
Mental Multiplication	<p>Using number facts</p> <p>Use times-tables facts up to 12×12 to multiply multiples of 10/100 of the multiplier e.g. $4 \times 6 = 24$ so $40 \times 6 = 240$ and $400 \times 6 = 2400$</p> <p>Use knowledge of factors and multiples in multiplication e.g. 43×6 is double 43×3 e.g. 28×50 is half of 28×100 (2800) = 1400</p> <p>Know square numbers and cube numbers</p> <div style="text-align: center;">  </div>	<p>Using number facts</p> <p>Use times-tables facts up to 12×12 in mental multiplication of large numbers or numbers with up to 2 decimal places e.g. $6 \times 4 = 24$ and $0.06 \times 4 = 0.24$</p>
Written Multiplication	<p>Short multiplication of 2-, 3- and 4-digit numbers by 1-digit numbers e.g. 435×8</p> $ \begin{array}{r} 435 \\ \times 8 \\ \hline 24 \\ \hline 3480 \end{array} $ <p>Long multiplication of 2-, 3- and 4-digit numbers by 'teen' numbers e.g. 48×16</p> $ \begin{array}{r} 48 \\ \times 16 \\ \hline 288 \\ 480 \\ \hline 768 \end{array} $	<p>Short multiplication of 2-, 3- and 4-digit numbers by 1-digit numbers e.g. 3743×6</p> $ \begin{array}{r} 3743 \\ \times 6 \\ \hline 4218 \\ \hline 22458 \end{array} $ <p>Long multiplication of 2-, 3- and 4-digit numbers by 2-digit numbers e.g. 456×38</p> $ \begin{array}{r} 456 \\ \times 38 \\ \hline 3648 \\ 13680 \\ \hline 17328 \end{array} $

Year 5

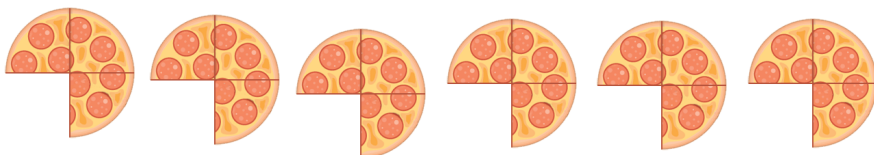
Grid multiplication of numbers with up to 2 decimal places by 1-digit numbers

e.g. 1.34×6

x	1	0.3	0.04	
6	6	1.8	0.24	= 8.04

Multiply fractions by 1-digit numbers

e.g. $\frac{3}{4} \times 6 = \frac{18}{4} = 4 \frac{2}{4} = 4 \frac{1}{2}$



NB Grid multiplication provides a default method for ALL children

Year 6

Short multiplication of decimal numbers using $\times 100$ and $\div 100$

e.g. 13.72×6 as $(1372 \times 6) \div 100 = 82.32$

Short multiplication of money

e.g. $\text{£}13.72 \times 6$

£	1	3	7	2	
	x				6
			2	4	1
£	8	2	3	2	

Grid multiplication of numbers with up to 2 decimal places by 1-digit numbers

e.g. 6.76×4

x	6	0.7	0.06	
4	24	2.8	0.24	= 27.04

Multiply simple pairs of proper fractions

e.g. $\frac{1}{2} \times \frac{1}{4} = \frac{1}{8}$

- - -

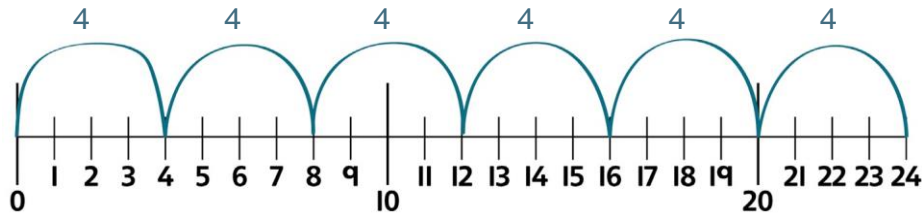
NB Grid multiplication provides a default method for ALL children

Year 3

Counting in steps ('clever' counting)

Count in 2s, 3s, 4s, 5s, 8s and 10s

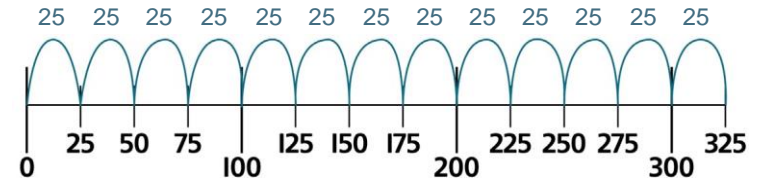
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100



Year 4

Counting in steps (sequences)

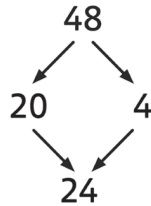
Count in 2s, 3s, 4s, 5s, 6s, 7s, 8s, 9s, 10s, 11s, 12s, 25s, 50s, 100s and 1000s



Year 3

Doubling and halving

Find half of even numbers to 100 using partitioning
e.g. *find half of 48*

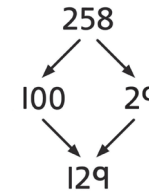


Use halving as a strategy in dividing by 2
e.g. $36 \div 2$ is half of 36 = 18
Find half of odd numbers

Year 4

Doubling and halving


Find half of even numbers to 200 and beyond using partitioning
e.g. *find half of 258*



Begin to halve amounts of money
e.g. £9 halved is £4.50

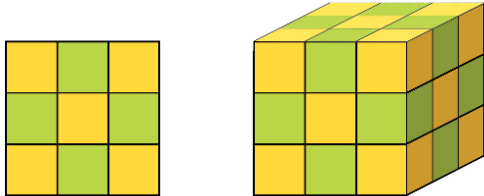
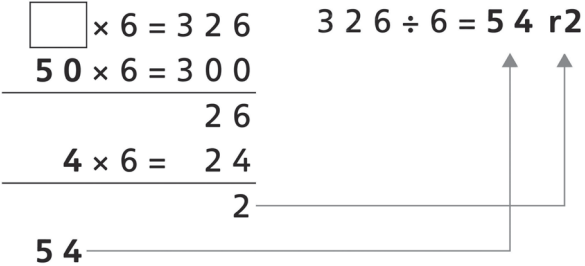


Use halving as a strategy in dividing by 2, 4 and 8
e.g. $164 \div 4$ is half of 164 (82) halved again = 41

	Year 3	Year 4
Mental Division	<p>Grouping</p> <p>Recognise that division is not commutative e.g. $16 \div 8$ does not equal $8 \div 16$</p> <p>Relate division to multiplications 'with holes in' e.g. $_ \times 5 = 30$ is the same calculation as $30 \div 5 = _$ thus we can count in 5s to find the answer</p>  <p style="text-align: center;">$_ \times \text{£}5 = \text{£}30$</p> <p>Divide multiples of 10 by 1-digit numbers e.g. $240 \div 8 = 30$</p> <p>Begin to use subtraction of multiples of 10 of the divisor to divide numbers above the 10th multiple e.g. $52 \div 4$ is 10×4 (40) and 3×4 (12) = 13</p>	<p>Grouping</p> <p>Use multiples of 10 times the divisor to divide by 1-digit numbers above the tables facts e.g. $45 \div 3$ as 10×3 (30) and 5×3 (15)</p> <div style="text-align: center;"> $45 \div 3 = \square$ $\square \times 3 = 45$ $45 \div 3 = 15$ $10 \times 3 = 30$ $\quad \quad 15$ $5 \times 3 = 15$ $\quad \quad \quad 0$ 15 </div> <p>Divide multiples of 100 by 1-digit numbers using division facts e.g. $3200 \div 8 = 400$</p>

	Year 3	Year 4																																																																																																																																																																									
Mental Division	<p>Using number facts</p> <p>Know half of even numbers to 40 Know half of multiples of 10 to 200 e.g. <i>half of 170 is 85</i></p> <p>Know x2, x3, x4, x5, x8, x10 division facts</p>	<p>Using number facts</p> <p>Know times-tables up to 12 x 12 and all related division facts</p> <table border="1" data-bbox="1355 287 1892 829"> <thead> <tr> <th>x</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>5</th> <th>6</th> <th>7</th> <th>8</th> <th>9</th> <th>10</th> <th>11</th> <th>12</th> </tr> </thead> <tbody> <tr><td>1</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td></tr> <tr><td>2</td><td>2</td><td>4</td><td>6</td><td>8</td><td>10</td><td>12</td><td>14</td><td>16</td><td>18</td><td>20</td><td>22</td><td>24</td></tr> <tr><td>3</td><td>3</td><td>6</td><td>9</td><td>12</td><td>15</td><td>18</td><td>21</td><td>24</td><td>27</td><td>30</td><td>33</td><td>36</td></tr> <tr><td>4</td><td>4</td><td>8</td><td>12</td><td>16</td><td>20</td><td>24</td><td>28</td><td>32</td><td>36</td><td>40</td><td>44</td><td>48</td></tr> <tr><td>5</td><td>5</td><td>10</td><td>15</td><td>20</td><td>25</td><td>30</td><td>35</td><td>40</td><td>45</td><td>50</td><td>55</td><td>60</td></tr> <tr><td>6</td><td>6</td><td>12</td><td>18</td><td>24</td><td>30</td><td>36</td><td>42</td><td>48</td><td>54</td><td>60</td><td>66</td><td>72</td></tr> <tr><td>7</td><td>7</td><td>14</td><td>21</td><td>28</td><td>35</td><td>42</td><td>49</td><td>56</td><td>63</td><td>70</td><td>77</td><td>84</td></tr> <tr><td>8</td><td>8</td><td>16</td><td>24</td><td>32</td><td>40</td><td>48</td><td>56</td><td>64</td><td>72</td><td>80</td><td>88</td><td>96</td></tr> <tr><td>9</td><td>9</td><td>18</td><td>27</td><td>36</td><td>45</td><td>54</td><td>63</td><td>72</td><td>81</td><td>90</td><td>99</td><td>108</td></tr> <tr><td>10</td><td>10</td><td>20</td><td>30</td><td>40</td><td>50</td><td>60</td><td>70</td><td>80</td><td>90</td><td>100</td><td>110</td><td>120</td></tr> <tr><td>11</td><td>11</td><td>22</td><td>33</td><td>44</td><td>55</td><td>66</td><td>77</td><td>88</td><td>99</td><td>110</td><td>121</td><td>132</td></tr> <tr><td>12</td><td>12</td><td>24</td><td>36</td><td>48</td><td>60</td><td>72</td><td>84</td><td>96</td><td>108</td><td>120</td><td>132</td><td>144</td></tr> </tbody> </table>	x	1	2	3	4	5	6	7	8	9	10	11	12	1	1	2	3	4	5	6	7	8	9	10	11	12	2	2	4	6	8	10	12	14	16	18	20	22	24	3	3	6	9	12	15	18	21	24	27	30	33	36	4	4	8	12	16	20	24	28	32	36	40	44	48	5	5	10	15	20	25	30	35	40	45	50	55	60	6	6	12	18	24	30	36	42	48	54	60	66	72	7	7	14	21	28	35	42	49	56	63	70	77	84	8	8	16	24	32	40	48	56	64	72	80	88	96	9	9	18	27	36	45	54	63	72	81	90	99	108	10	10	20	30	40	50	60	70	80	90	100	110	120	11	11	22	33	44	55	66	77	88	99	110	121	132	12	12	24	36	48	60	72	84	96	108	120	132	144
x	1	2	3	4	5	6	7	8	9	10	11	12																																																																																																																																																															
1	1	2	3	4	5	6	7	8	9	10	11	12																																																																																																																																																															
2	2	4	6	8	10	12	14	16	18	20	22	24																																																																																																																																																															
3	3	6	9	12	15	18	21	24	27	30	33	36																																																																																																																																																															
4	4	8	12	16	20	24	28	32	36	40	44	48																																																																																																																																																															
5	5	10	15	20	25	30	35	40	45	50	55	60																																																																																																																																																															
6	6	12	18	24	30	36	42	48	54	60	66	72																																																																																																																																																															
7	7	14	21	28	35	42	49	56	63	70	77	84																																																																																																																																																															
8	8	16	24	32	40	48	56	64	72	80	88	96																																																																																																																																																															
9	9	18	27	36	45	54	63	72	81	90	99	108																																																																																																																																																															
10	10	20	30	40	50	60	70	80	90	100	110	120																																																																																																																																																															
11	11	22	33	44	55	66	77	88	99	110	121	132																																																																																																																																																															
12	12	24	36	48	60	72	84	96	108	120	132	144																																																																																																																																																															
Written Division	<p>Perform divisions just above the 10th multiple using written jottings, understanding how to give a remainder as a whole number</p> <p>Use division facts to find unit and simple non-unit fractions of amounts within the times-tables</p> <p>- e.g. <i>3/4 of 48 is $3 \times (48 \div 4) = 36$</i></p>	<p>Use a written version of a mental method to divide 2- and 3-digit numbers by 1-digit numbers</p> <p>e.g. <i>$86 \div 3$ as $20 \times 3 (60)$ and $8 \times 3 (24)$, remainder 2</i></p> $86 \div 3 = \square$ $\square \times 3 = 86 \quad 86 \div 3 = 28 \text{ r}2$ <table style="margin-left: 20px;"> <tr> <td style="border-bottom: 1px solid black; padding: 2px;">$20 \times 3 = 60$</td> <td style="padding: 2px;">$86 \div 3 = 28 \text{ r}2$</td> </tr> <tr> <td style="padding: 2px;">26</td> <td style="padding: 2px;">$\uparrow \uparrow$</td> </tr> <tr> <td style="border-bottom: 1px solid black; padding: 2px;">$8 \times 3 = 24$</td> <td style="padding: 2px;">$\uparrow \uparrow$</td> </tr> <tr> <td style="padding: 2px;">2</td> <td style="padding: 2px;">$\uparrow \uparrow$</td> </tr> <tr> <td style="padding: 2px;">28</td> <td style="padding: 2px;">$\uparrow \uparrow$</td> </tr> </table> <p>Use division facts to find unit and non-unit fractions of amounts within the times-tables</p> <p>- e.g. <i>7/8 of 56 is $7 \times (56 \div 8) = 48$</i></p>	$20 \times 3 = 60$	$86 \div 3 = 28 \text{ r}2$	26	$\uparrow \uparrow$	$8 \times 3 = 24$	$\uparrow \uparrow$	2	$\uparrow \uparrow$	28	$\uparrow \uparrow$																																																																																																																																																															
$20 \times 3 = 60$	$86 \div 3 = 28 \text{ r}2$																																																																																																																																																																										
26	$\uparrow \uparrow$																																																																																																																																																																										
$8 \times 3 = 24$	$\uparrow \uparrow$																																																																																																																																																																										
2	$\uparrow \uparrow$																																																																																																																																																																										
28	$\uparrow \uparrow$																																																																																																																																																																										

	Year 5	Year 6																								
Mental Division	<p>Doubling and halving Halve amounts of money using partitioning e.g. <i>half of £14.84 is half of £14 (£7) plus half of 84p (42p)</i></p> <div style="text-align: center;"> </div> <p>Use doubling and halving as a strategy in dividing by 2, 4, 8, 5 and 20 e.g. $115 \div 5$ as <i>double 115</i> $(230) \div 10 = 23$</p> <p>Grouping Divide numbers by 10, 100, 1000 to obtain decimal answers with up to 3 decimal places e.g. $340 \div 100 = 3.4$ Use the 10th, 20th, 30th ... multiple of the divisor to divide 'friendly' 2- and 3-digit numbers by 1-digit numbers e.g. $186 \div 6$ as 30×6 (180) and 1×6 (6)</p> <div style="text-align: center;"> $186 \div 6 = \square$ <table style="margin: auto;"> <tr> <td style="border: 1px solid black; padding: 2px;">\square</td> <td>$\times 6 = 186$</td> <td rowspan="4" style="padding-left: 20px;">$186 \div 6 = 31$</td> </tr> <tr> <td style="border: 1px solid black; padding: 2px;">30</td> <td>$\times 6 = 180$</td> </tr> <tr> <td style="border: 1px solid black; padding: 2px;"></td> <td style="text-align: right;">6</td> </tr> <tr> <td style="border: 1px solid black; padding: 2px;">1</td> <td>$\times 6 = 6$</td> </tr> <tr> <td></td> <td style="text-align: right;">0</td> <td></td> </tr> </table> </div>	\square	$\times 6 = 186$	$186 \div 6 = 31$	30	$\times 6 = 180$		6	1	$\times 6 = 6$		0		<p>Doubling and halving Halve decimal numbers with up to 2 places using partitioning e.g. <i>half of 36.86 is half of 36 (18) plus half of 0.86 (0.43)</i></p> <div style="text-align: center;"> </div> <p>Use doubling and halving as strategies in mental division</p> <p>Grouping Use the 10th, 20th, 30th, ... or 100th, 200th, 300th ... multiples of the divisor to divide large numbers e.g. $378 \div 9$ as 40×9 (360) and 2×9 (18), remainder 2</p> <div style="text-align: center;"> $378 \div 9 = \square$ <table style="margin: auto;"> <tr> <td style="border: 1px solid black; padding: 2px;">\square</td> <td>$\times 9 = 378$</td> <td rowspan="4" style="padding-left: 20px;">$378 \div 9 = 42 \text{ r}2$</td> </tr> <tr> <td style="border: 1px solid black; padding: 2px;">40</td> <td>$\times 9 = 360$</td> </tr> <tr> <td style="border: 1px solid black; padding: 2px;"></td> <td style="text-align: right;">18</td> </tr> <tr> <td style="border: 1px solid black; padding: 2px;">2</td> <td>$\times 9 = 18$</td> </tr> <tr> <td></td> <td style="text-align: right;">2</td> <td></td> </tr> </table> </div> <p>Use tests for divisibility e.g. <i>135 divides by 3, as $1 + 3 + 5 = 9$ and 9 is in the x3 table</i></p>	\square	$\times 9 = 378$	$378 \div 9 = 42 \text{ r}2$	40	$\times 9 = 360$		18	2	$\times 9 = 18$		2	
	\square	$\times 6 = 186$	$186 \div 6 = 31$																							
30	$\times 6 = 180$																									
	6																									
1	$\times 6 = 6$																									
	0																									
\square	$\times 9 = 378$	$378 \div 9 = 42 \text{ r}2$																								
40	$\times 9 = 360$																									
	18																									
2	$\times 9 = 18$																									
	2																									

	Year 5	Year 6
Mental Division	<p>Using number facts</p> <p>Use division facts from the times-tables up to 12×12 to divide multiples of powers of 10 of the divisor e.g. $3600 \div 9$ using $36 \div 9$</p> <p>Know square numbers and cube numbers</p> 	<p>Using number facts</p> <p>Use division facts from the times-tables up to 12×12 to divide decimal numbers by 1-digit numbers e.g. $1.17 \div 3$ is $1/100$ of $117 \div 3$ (39)</p> <p>Know tests of divisibility for numbers divisible by 2, 3, 4, 5, 9, 10 and 25</p>
Written Division	<p>Use a written version of a mental strategy to divide 3-digit numbers by 1-digit numbers e.g. $326 \div 6$ as 50×6 (300) and 4×6 (24), remainder 2</p> $326 \div 6 = \square$ $\square \times 6 = 326$ $50 \times 6 = 300$ <hr style="width: 100px; margin-left: 0;"/> 26 $4 \times 6 = 24$ <hr style="width: 100px; margin-left: 0;"/> 2 54 	<p>Short division of 3- and 4-digit numbers by 1-digit numbers e.g. $139 \div 3$</p> $3 \overline{) 139} \begin{matrix} 46 \\ \text{r} 1 \end{matrix}$ <p>Long division of 3- and 4-digit numbers by 2-digit numbers e.g. $4176 \div 13$</p> $13 \overline{) 4176} \begin{matrix} 300 + 20 + 1, \text{r} 3 \\ -3900 \\ \hline 276 \\ -260 \\ \hline 16 \\ -13 \\ \hline 3 \end{matrix}$

	Year 5	Year 6
Written Division	<p>Short division of 3- and 4-digit numbers by 1-digit numbers e.g. $139 \div 3$</p> $\begin{array}{r} 46 \text{ r } 1 \\ 3 \overline{) 139} \end{array}$ <p>Give remainders as whole numbers or as fractions Find unit and non-unit fractions of large amounts - e.g. $\frac{3}{5}$ of 265 is $3 \times (265 \div 5) = 159$ Turn improper fractions into mixed numbers and vice versa</p>	<p>Give remainders as whole numbers, fractions or decimals Use place value to divide 1- and 2-place decimals by numbers ≤ 12 e.g. $3.65 \div 5$ as $(365 \div 5) \div 100 = 0.73$ Divide proper fractions by whole numbers</p>