

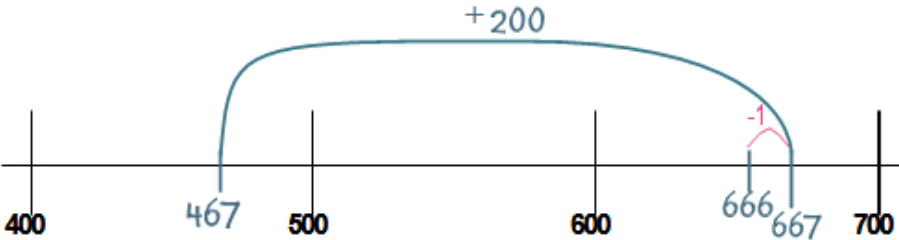
LOWER KEY STAGE 2

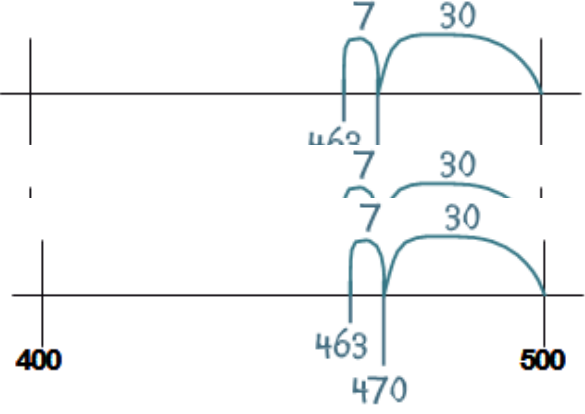
In Lower Key Stage 2, children build on the concrete and conceptual understandings they have gained in Key Stage 1 to develop a real mathematical understanding of the four operations, in particular developing arithmetical competence in relation to larger numbers.

Addition and subtraction: Children are taught to use place value and number facts to add and subtract numbers mentally and they will develop a range of strategies to enable them to discard the ‘counting in 1s’ or fingers-based methods of Key Stage 1. In particular, children will learn to add and subtract multiples and near multiples of 10, 100 and 1000, and will become fluent in complementary addition as an accurate means of achieving fast and accurate answers to 3-digit subtractions. Standard written methods for adding larger numbers are taught, learned and consolidated, and written column subtraction is also introduced.

Multiplication and division: This key stage is also the period during which all the multiplication and division facts are thoroughly memorised, including all facts up to 12×12 . Efficient written methods for multiplying or dividing a 2-digit or 3-digit number by a 1-digit number are taught, as are mental strategies for multiplication or division with large but ‘friendly’ numbers, e.g. when dividing by 5 or multiplying by 20.

Fractions and decimals: Children will develop their understanding of fractions, learning to reduce a fraction to its simplest form, as well as finding non-unit fractions of amounts and quantities. The concept of a decimal number is introduced and children consolidate a firm understanding of 1-place decimals, multiplying and dividing whole numbers by 10 and 100.

| | | Year 4 Mental Methods | Year 4 Written Methods |
|----------|---|---|--|
| Addition | Using place value | <p>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>Build on expanded column addition to develop compact column addition with larger numbers e.g. $1466 + 4868$</p> $ \begin{array}{r} 1000 \quad 400 \quad 60 \quad 6 \\ 4000 \quad 800 \quad 60 \quad 8 \\ + 1000 \quad 100 \quad 10 \quad \\ \hline 6000 \quad 300 \quad 30 \quad 4 \end{array} $ |
| | Counting on | <p>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>Compact column addition with larger numbers e.g. $5347 + 2286 + 1495$</p> $ \begin{array}{r} 5347 \\ 2286 \\ + 1495 \\ \hline 9128 \end{array} $ |
| | Count on to add 3-digit numbers and money | <p>e.g. $463 + 124$ as $463 + 100$ (563) + 20 (583) + 4 = 587 e.g. $£4.67 + £5.30$ as $£9.67 + 30p$</p> | <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> |

| | Year 4 Mental Methods | Year 4 Written Methods |
|----------|---|------------------------|
| Addition |  <p>Number bonds to £1 and to the next whole pound e.g. $63p + 37p = £1$ e.g. $£3.45 + 55p = £4$ Add to the next whole number e.g. $4.6 + 0.4$ e.g. $7.2 + 0.8$</p> | |

Year 4 Mental Methods

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. $6723 - 3000$

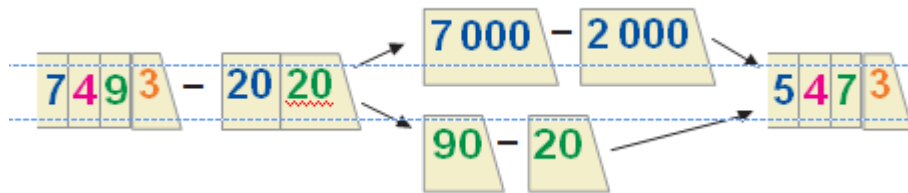
e.g. $£3.74 - 30p$

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

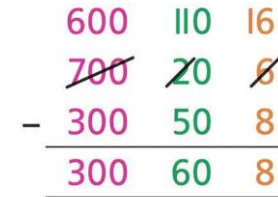
e.g. $3522 - 1999$

e.g. $£34.86 - £19.99$

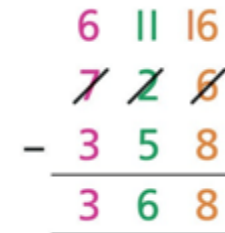
Year 4 Written Methods

Expanded column subtraction with 3- and 4-digit numbers

e.g. $726 - 358$



Begin to develop compact column subtraction e.g. $726 - 358$



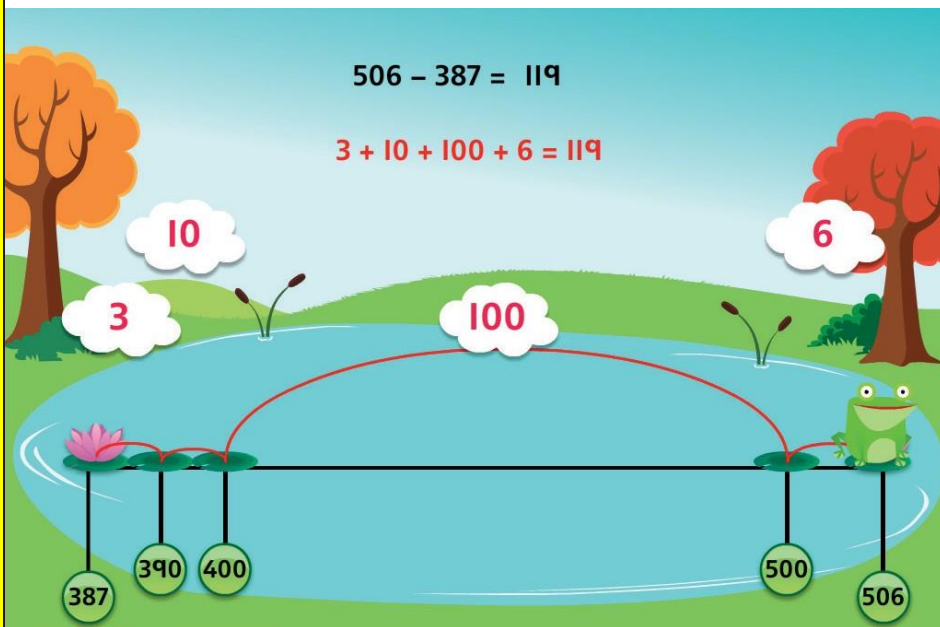
Year 4 Mental Methods

Counting up

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

e.g. $506 - 387$

e.g. $4000 - 2693$



Subtraction

Year 4 Written Methods

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

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



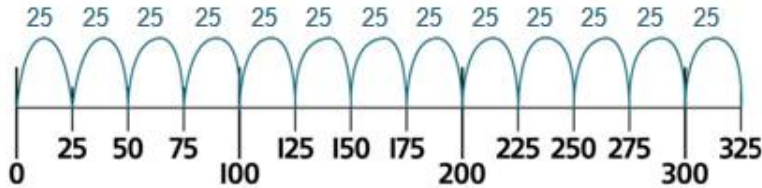
Subtract like fractions

e.g. $\frac{3}{8} - \frac{1}{8} = \frac{2}{8}$

Year 4 Mental Methods

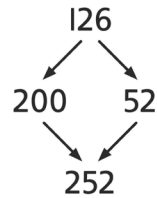
Counting in steps (sequences)

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 4 Written Methods

Use grid multiplication to multiply 3-digit numbers by

$$\begin{array}{r}
 253 \\
 \times \quad 6 \\
 \hline
 1200 \leftarrow 6 \times 200 \\
 300 \leftarrow 6 \times 50 \\
 + \quad 18 \leftarrow 6 \times 3 \\
 \hline
 1518
 \end{array}$$

1518

multiply 3-digit

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

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 |
| | | | <u>768</u> |

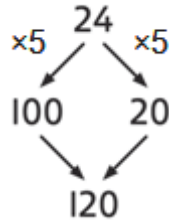
Year 4 Mental Methods

Year 4 Written Methods

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

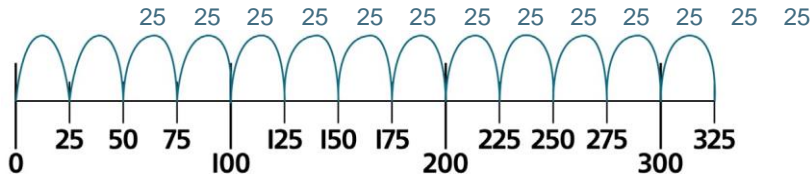
Know times-tables up to 12×12

| 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 4 Mental Methods

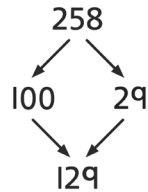
Counting in steps (sequences)

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



Doubling and halving

Find 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 4 Written Methods

Use a written version of a mental method to divide 2- and 3-digit numbers by 1-digit numbers

e.g. $86 \div 3$ as 20×3 (60) and 8×3 (24), remainder 2

$$86 \div 3 = \square$$

$$\begin{array}{r} \square \times 3 = 86 \\ 20 \times 3 = 60 \\ \hline 26 \\ 8 \times 3 = 24 \end{array}$$

$$86 \div 3 = 28 \text{ r}2$$



| | Year 4 Mental Methods | Year 4 Written Methods | | | | | | | | | |
|-----------------|--|------------------------|----------|--|---|----------|----|--|---|---|--|
| Division | <p>Grouping</p> <p>Use multiples of 10 times the divisor to divide by 1-digit numbers above the tables facts</p> <p>e.g. $45 \div 3$ as 10×3 (30) and 5×3 (15)</p> $45 \div 3 = \square$ $\square \times 3 = 45 \quad 45 \div 3 = 15$ <table style="margin-left: 20px;"> <tr> <td style="border-bottom: 1px solid black;">10</td> <td style="padding-left: 10px;">× 3 = 30</td> <td></td> </tr> <tr> <td style="border-bottom: 1px solid black;">5</td> <td style="padding-left: 10px;">× 3 = 15</td> <td style="padding-left: 10px;">15</td> </tr> <tr> <td></td> <td style="padding-left: 10px;">0</td> <td style="padding-left: 10px;">0</td> </tr> </table> <p style="margin-left: 20px;">15</p> <p>Divide multiples of 100 by 1-digit numbers using division facts e.g. $3200 \div 8 = 400$</p> | 10 | × 3 = 30 | | 5 | × 3 = 15 | 15 | | 0 | 0 | |
| 10 | × 3 = 30 | | | | | | | | | | |
| 5 | × 3 = 15 | 15 | | | | | | | | | |
| | 0 | 0 | | | | | | | | | |

Year 4 Mental Methods

Year 4 Written Methods

Know times-tables up to 12×12 and all related division facts

Division

| × | 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 |