Pensans' Written Method Calculation Policy
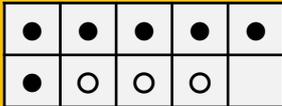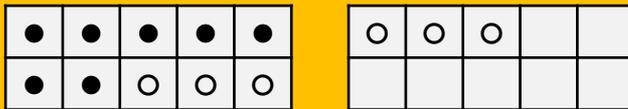
Year 1

Add two one-digit numbers and a two-digit and one-digit number with a total less than 20.

Addition

➢ Solid circles for the first addend, hollow circles for the second.
➢ Solid represents RED   Hollow represents YELLOW
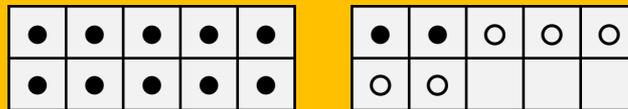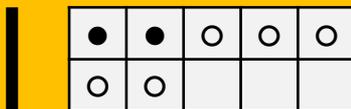➢ Fill in the Tens Frames top row first, from the left.

Example: 6 + 3 = 9
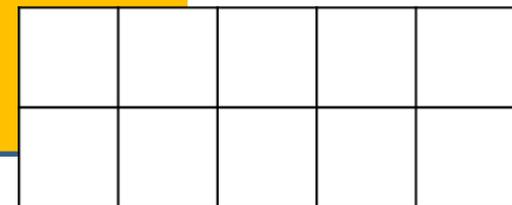
Example: 7 + 6 = 13

Example (two frames): 12 + 5 = 17

Example (tens and ones): 12 + 5 = 17

Resources:

• Tens Frames

• Two sided counters
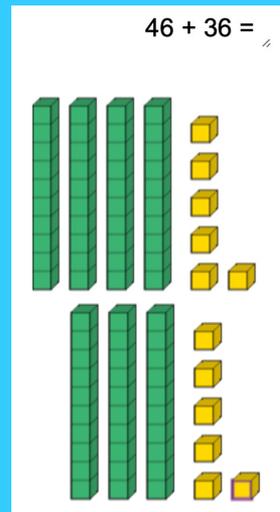
• Dienes

Practical first!

Year 2

Add ones to a two-digit number.

Add tens to a two-digit number.

Add one two-digit number to another.

National curriculum expectations

Addition

Resources:

- Dienes

Practical + Pictorial

43 + 6 =

34 + 9 =

43 + 25 =

46 + 36 =
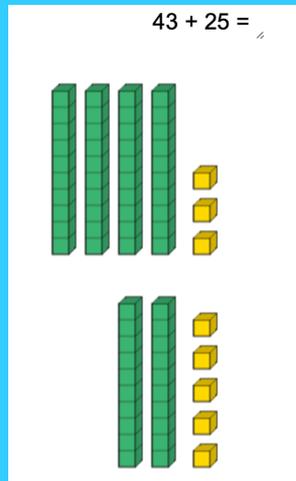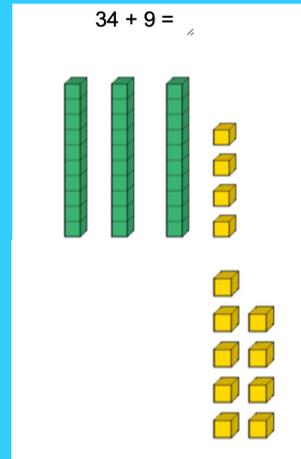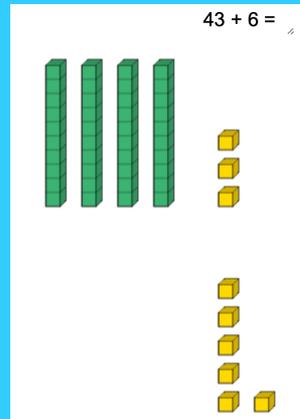
Abstract   **Short Column Written Method**

Two-digit + one-digit (not going over 10)
Example 43 + 6 = 49

```
    4   3
+   0   6
-------
    4   9
-------
```

Two-digit + one-digit (going over 10)
Example 34 + 9 = 43

```
    3   4
+   0   9
-------
    4   3
-------
    1
```

Two-digit + two-digit (not going over 10)
Example 43 + 25 = 68

```
    4   3
+   2   5
-------
    6   8
-------
```

Two-digit + two-digit (going over 10)
Example 46 + 36 = 82

```
    4   6
+   3   6
-------
    8   2
-------
    1
```

Addition

Year 3

Add numbers with up to 3 digits using formal written methods of columnar addition.

Resources:

- Dienes

Practical + Pictorial
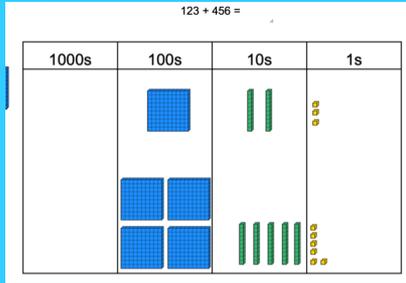
a) 123 + 456 = 579

b) 385 + 386 = 771
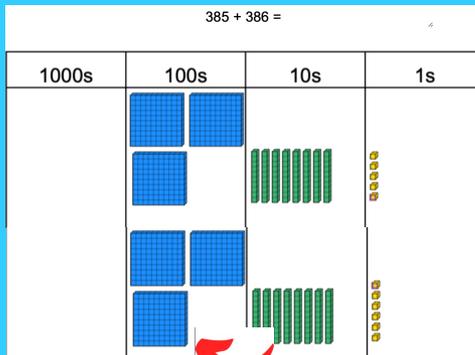
c) 47 + 276 = 323
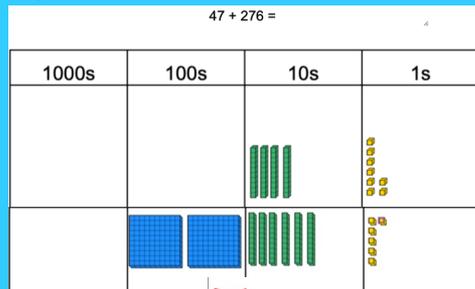
Abstract

Short Column Written Method

3-digit + 3-digit

a) 123 + 456 = 579

```
      1   2   3
  +   4   5   6
  _____
      5   7   9
  _____
```

b) 385 + 386 = 771

```
      3   8   5
  +   3   8   6
  _____
      7   7   1
  _____
      1   1
```

Mixed 2-digit + 3-digit

c) 47 + 276 = 323

```
      0   4   7
  +   2   7   6
  _____
      3   2   3
  _____
      1   1
```

Year 4

National curriculum expectations

Add numbers with up to 4 digits using the formal written methods of columnar addition.

Addition

Resources:

- Dienes
- Place Value Mats (Progressive)

Practical + Pictorial

a) 2,123 + 3,456 = 5,579

b) 3,456 + 5,289 = 8,745

c) 7,777 + 8,888 = 16,665

Abstract

Short Column Written Method

4-digit + 4-digit

a) 2,123 + 3,456 = 5,579

$$
\begin{array}{cccc}
  & 2 & 1 & 2 & 3 \\
+ & 3 & 4 & 5 & 6 \\
\hline
  & 5 & 5 & 7 & 9 \\
\hline
\end{array}
$$

b) 3,456 + 5,289 = 8,745

$$
\begin{array}{cccc}
  & 3 & 4 & 5 & 6 \\
+ & 5 & 2 & 8 & 9 \\
\hline
  & 8 & 7 & 4 & 5 \\
  &   & 1 & 1 &   \\
\end{array}
$$

c) 7,777 + 8,888 = 16,665

$$
\begin{array}{ccccc}
  &   & 7 & 7 & 7 & 7 \\
+ &   & 8 & 8 & 8 & 8 \\
\hline
  & 1 & 6 & 6 & 6 & 5 \\
  & 1 & 1 & 1 & 1 &   \\
\end{array}
$$

Don't forget mixed 3-digit + 4-digit

Addition

Year 5 + 6

Add whole numbers with more than 4 digits including using formal written methods (columnar addition).

Practise adding decimals including a mix of whole numbers and decimals, decimals with different numbers of decimal places and compliments of 1 e.g 0.17 + 0.83 = 1.

Resources:

Place Value Mats (Progressive)

Practical + Pictorial

a) 52,849 + 18,423 = 71,272

c) 12.49 + 18.75 = 31.24

d) 108.4 + 5.756 = 114.156

Abstract

Short Column Written Method

More than 4-digit + 4-digit whole numbers

a) 52,849 + 18,423 = 71,272

```
    5  2  8  4  9
 +  1  8  4  2  3
 ─────────────────
    7  1  2  7  2
 ─────────────────
    1  1  -  1
```

b) 2,668,777 + 2,776,899 = 5,445,676

```
    2  6  6  8  7  7  7
 +  2  7  7  6  8  9  9
 ──────────────────────
    5  4  4  5  6  7  6
 ──────────────────────
    1  1  1  1  1  1
```

Decimals
(Same number of decimal places)

c) 12.49 + 18.75 = 31.24

```
    1  2  .  4  9
 +  1  8  .  7  5
 ────────────────
    3  1  .  2  4
 ────────────────
    1  1  -  1
```

Decimals
(Different number of decimal places)

d) 108.4 + 5.756 = 114.156

```
    1  0  8  .  4  0  0
 +  0  0  5  .  7  5  6
 ──────────────────────
    1  1  4  .  1  5  6
 ──────────────────────
    1  1
```

Add in place holders to 'box' the addition.

Don't forget mixed digit whole number questions

Addition Formal Written Methods for Calculation

National curriculum expectations

Addition

Column method

Year 2

Add up to 2 two-digit numbers.

2-digit + 2-digit

$43 + 25 = 68$

```
    4   3
+   2   5
_____
    6   8
_____
```

$46 + 36 = 82$

```
    4   6
+   3   6
_____
    8   2
_____
    1
```

$47 + 76 = 123$

```
        4   7
+       7   6
_____
    1   2   3
_____
    1   1
```

Year 3

Add numbers with up to 3 digits using formal written methods of columnar addition.

3-digit + 3-digit

$123 + 456 = 579$

```
    1   2   3
+   4   5   6
_____
    5   7   9
_____
```

$385 + 386 = 771$

```
    3   8   5
+   3   8   6
_____
    7   7   1
_____
    1   1
```

Year 4

Add numbers with up to 4 digits using the formal written methods of columnar addition.

4-digit + 4-digit

$2,123 + 3,456 = 5,579$

```
    2   1   2   3
+   3   4   5   6
_____
    5   5   7   9
```

$3,456 + 5,289 = 8,745$

```
    3   4   5   6
+   5   2   8   9
_____
    8   7   4   5
        1   1
```

$7,777 + 8,888 = 16,665$

```
        7   7   7   7
+       8   8   8   8
_____
    1   6   6   6   5
        1   1   1   1
```

Year 5 and Year 6

Add whole numbers with more than 4 digits including using formal written methods (columnar addition).

Practise adding decimals including a mix of whole numbers and decimals, decimals with different numbers of decimal places and compliments of 1 e.g $0.17 + 0.83 = 1$.

More than 4-digit + 4-digit

$52,849 + 18,423 = 71,272$

```
    5   2   8   4   9
+   1   8   4   2   3
_____
    7   1   2   7   2
    1   1   -   1
```

$2,668,777 + 2,776,899 = 5,445,676$

```
    2   6   6   8   7   7   7
+   2   7   7   6   8   9   9
_____
    5   4   4   5   6   7   6
    1   1   1   1   1   1
```

Decimals (Same number of decimal places)

$12.49 + 18.75 = 31.24$

```
    1   2   .   4   9
+   1   8   .   7   5
_____
    3   1   .   2   4
    1   1   -   1
```

Decimals (Different number of decimal places)

$108.4 + 5.756 = 114.156$

```
    1   0   8   .   4   0   0
+   0   0   5   .   7   5   6
_____
    1   1   4   .   1   5   6
            1   1
```

Add in place holders to 'box' the addition.

Year 1

Subtract one-digit and two-digit numbers to 20, including zero.

➢ Draw the starting number in **solid** circles and then <u>cross out </u>the amount you are taking away.
➢ Solid represents RED
➢ Fill in the Tens Frames top row first, from the left.

Subtraction

One-digit subtract one-digit   Example: 8 – 5 = 3
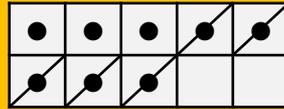
Two-digit subtract one-digit (not crossing ten)
Example: 17 – 4 = 13
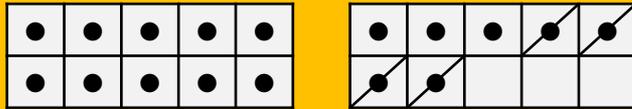
Two-digit subtract one-digit (crossing ten)
Example: 16 – 9 = 7
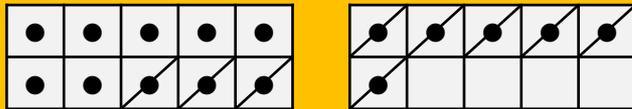
Two-digit subtract two-digit
Example: 19 – 13 = 6
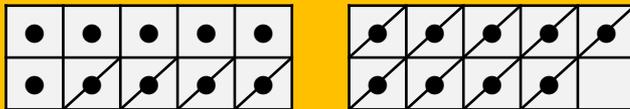
Resources:

• Tens Frames

• Two sided counters

• Dienes

Practical first!

Year 2

Subtraction

National curriculum expectations

Subtract ones from a two-digit number.

Subtract tens from a two-digit number.

Subtract one two-digit number from another.

Resources:

- Dienes

Practical + Pictorial

a) $49 - 6 = 43$

b) $24 - 9 = 15$

c) $45 - 20 = 25$

d) $45 - 33 = 12$

e) $63 - 28 = 35$

Abstract   Short Column Written Method

Two-digit - single digit (not breaking 10)
a) $49 - 6 = 43$

$$\begin{array}{rr} 4 & 9 \\ - \quad 0 & 6 \\ \hline 4 & 3 \\ \hline \end{array}$$

Two-digit - single digit (breaking 10)
b) $34 - 9 = 25$

$$\begin{array}{rr} & 2 \\ \cancel{3} & {}^1 4 \\ - \quad 0 & 9 \\ \hline 2 & 5 \\ \hline \end{array}$$

Two-digit - tens
c) $45 - 20 = 25$

$$\begin{array}{rr} 4 & 5 \\ - \quad 2 & 0 \\ \hline 2 & 5 \\ \hline \end{array}$$

Two-digit - two-digit (not breaking 10)
d) $45 - 33 = 12$

$$\begin{array}{rr} 4 & 5 \\ - \quad 3 & 3 \\ \hline 1 & 2 \\ \hline \end{array}$$

Two-digit - two-digit (breaking 10)
e) $63 - 28 = 35$

$$\begin{array}{rr} 5 & \\ \cancel{6} & {}^1 3 \\ - \quad 2 & 8 \\ \hline 3 & 5 \\ \hline \end{array}$$

Year 3

Subtraction

National curriculum expectations

Subtract numbers with up to 3 digits using formal written methods of columnar subtraction.

Resources:

- Dienes

Practical + Pictorial

563 - 241 = 322

1000s	100s	10s	1s

652 - 287 =

1000s	100s	10s	1s

600 - 255 = 345

1000s	100s	10s	1s
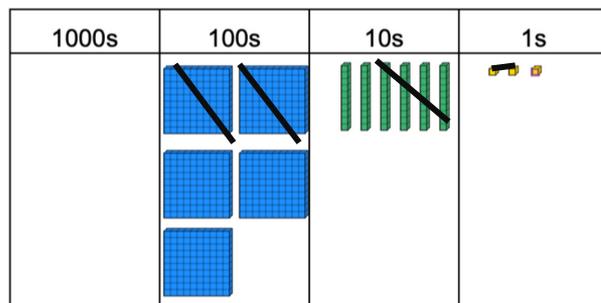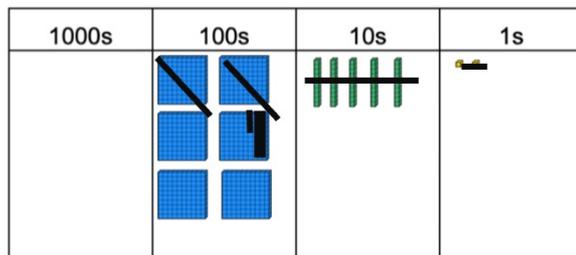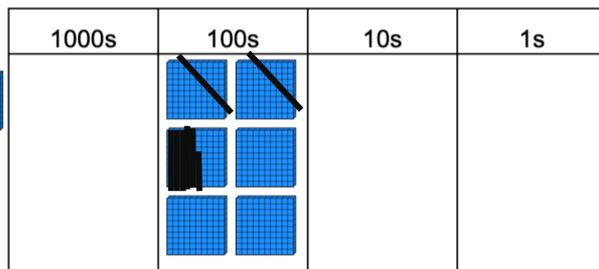
Abstract

Short Column Written Method

3-digit - 3-digit

$563 - 241 = 322$

```
    5   6   3
-   2   4   1
  _____
    3   2   2
```

$652 - 287 = 365$

```
        5      ¹4
        6      5      ¹2
-       2      8      7
      _____
        3      6      5
```

$600 - 255 = 345$

```
        5       9
        6      ¹0     ¹0
-       2       5      5
      _____
        3       4      5
```

Don't forget mixed digit whole number questions

Subtraction

National curriculum expectations

Year 4

Subtract numbers with up to 4 digits using the formal written methods of columnar subtraction.

Resources:

- Dienes
- Place Value Mats (Progressive)

Practical + Pictorial

$451 - 325 = 126$

Abstract

Short Column Written Method

4-digit + 4-digit

a) $8,469 - 2,127 = 6,342$

```
   8   4   6   9
-  2   1   2   7
_____
   6   3   4   2
```

b) $7,503 - 3,278 = 4,225$

```
           4       9
   7       5¹0     ¹013
-  3       2   7   8
_____
   4       2   2   5
```

c) $6,000 - 2,543 = 3,457$

```
   5       9       9
   6¹0     ¹0     ¹0    ¹0
-  2       5   4   3
_____
   3       4   5   7
```

Don't forget mixed digit whole number questions

Subtraction Formal Written Methods for Calculation

Subtraction

Subtract whole numbers with more than 4 digits including using formal written methods (columnar subtraction).

Practise subtracting decimals, including a mix of whole numbers and decimals, followed by decimals with different numbers of decimal places.

Resources:

- Dienes
- Place Value Mats (Progressive)

Practical + Pictorial

a) $52,849 - 18,423 = 34,426$

b) $2,000,000 - 287,941 = 1,712,059$

d) $14 - 3.692 = 10.308$

Abstract

Short Column Written Method

More than 4-digit + 4-digit whole numbers

a) $52,849 - 18,423 = 34,426$

$$\begin{array}{rrrrr} & 4 & & & \\ \cancel{5} & {}^{1}2 & 8 & 4 & 9 \\ - \quad 1 & 8 & 4 & 2 & 3 \\ \hline 3 & 4 & 4 & 2 & 6 \end{array}$$

b) $2,000,000 - 287,941 = 1,712,059$

$$\begin{array}{rrrrrrr} 1 & 9 & 9 & 9 & 9 & 9 & \\ \cancel{2} & {}^{1}\cancel{0} & {}^{1}\cancel{0} & {}^{1}\cancel{0} & {}^{1}\cancel{0} & {}^{1}\cancel{0} & {}^{1}0 \\ - \quad 0 & 2 & 8 & 7 & 9 & 4 & 1 \\ \hline 1 & 7 & 1 & 2 & 0 & 5 & 9 \end{array}$$

Add in place holders to 'box' the subtraction.

With decimals

c) $63.75 - 17.28 = 46.47$

$$\begin{array}{rrrrr} 5 & & & 6 & \\ \cancel{6} & {}^{1}3 & . & \cancel{7} & {}^{1}5 \\ - \quad 1 & 7 & . & 2 & 8 \\ \hline 4 & 6 & . & 4 & 7 \end{array}$$

d) $14 - 3.692 = 10.308$

$$\begin{array}{rrrrr} & 3 & & 9 & 9 \\ 1 & \cancel{4} & . & {}^{1}\cancel{0} & {}^{1}\cancel{0} & {}^{1}0 \\ - \quad 0 & 3 & . & 6 & 9 & 2 \\ \hline 1 & 0 & . & 3 & 0 & 8 \end{array}$$

Don't forget mixed digit whole number questions

Subtraction Formal Written Methods for Calculation

Subtraction

Column method

Year 2

Subtract ones from a two-digit number.

Subtract tens from a two-digit number.

Subtract one two-digit number from another.

2-digit - 2-digit

$74 - 23 = 51$

```
    7   4
-   2   3
  ---------
    5   1
```

$63 - 48 = 15$

```
      5
      6   ¹3
  -
      4   8
    ---------
      1   5
```

Year 3

Subtract numbers with up to 3 digits using formal written methods of columnar subtraction.

3-digit - 3-digit

$563 - 241 = 322$

```
    5   6   3
-   2   4   1
  -------------
    3   2   2
```

$652 - 287 = 365$

```
    5      ¹4
    6   5   ¹2
-   2   8   7
  -------------
    3   6   5
```

$600 - 255 = 345$

```
    5   9
    6   ¹0   ¹0
-   2   5   5
  -------------
    3   4   5
```

Year 4

Subtract numbers with up to 4 digits using the formal written methods of columnar subtraction.

4-digit - 4-digit

$8,469 - 2,127 = 6,342$

```
    8   4   6   9
-   2   1   2   7
  -----------------
    6   3   4   2
```

$7,503 - 3,278 = 4,225$

```
          4   9
    7   5   ¹0   ¹3
-   3   2   7   8
  -----------------
    4   2   2   5
```

$6,000 - 2,543 = 3,457$

```
    5   9   9
    6   ¹0   ¹0   ¹0
-   2   5   4   3
  -----------------
    3   4   5   7
```

Year 5 and Year 6

Subtract whole numbers with more than 4 digits including using formal written methods (columnar subtraction).

Practise subtracting decimals, including a mix of whole numbers and decimals, followed by decimals with different numbers of decimal places.

$52,849 - 18,423 = 34,426$

```
    4
    5   ¹2   8   4   9
-   1   8   4   2   3
  ---------------------
    3   4   4   2   6
```

$2,000,000 - 287, 941 = 1,712,059$

```
    1   9   9   9   9   9
    2   ¹0   ¹0   ¹0   ¹0   ¹0   ¹0
-   0   2   8   7   9   4   1
  ---------------------------------
    1   7   1   2   0   5   9
```

Add in place holders to 'box' the subtraction.

With decimals

$63.75 - 17.28 = 46.47$

```
    5          6
    6   ¹3   .   7   ¹5
-   1   7   .   2   8
  ---------------------
    4   6   .   4   7
```

$14 - 3.692 = 10.308$

```
          3      9   9
    1   4   .   ¹0   ¹0   ¹0
-   0   3   .   6   9   2
  -------------------------
    1   0   .   3   0   8
```

Multiplication Formal Written Methods for Calculation

Multiplication

Year 3

Multiply 2 numbers by a 1 digit number using a formal written layout.

Pupils practise to become fluent in the formal written method of short multiplication using the times tables they know.

Resources:

- Dienes

Practical + Pictorial

$34 \times 3 = 102$

Tens	Ones

$24 \times 4 = 96$

Tens	Ones

Abstract

Short Method
2 x 1 examples

$21 \times 4 = 84$

$$\begin{array}{ccc} & 2 & 1 \\ \times & & 4 \\ \hline & 8 & 4 \end{array}$$

$14 \times 5 = 70$

$$\begin{array}{ccc} & 1 & 4 \\ \times & & 5 \\ \hline & 7 & 0 \\ & 2 & \end{array}$$

$34 \times 8 = 272$

$$\begin{array}{ccc} & 3 & 4 \\ \times & & 8 \\ \hline 2 & 7 & 2 \\ 2 & 3 & \end{array}$$

Multiplication

National curriculum expectations

Year 4

Multiply 2 and 3 digit numbers by a 1 digit number using a formal written layout.

Pupils consolidate their fluency in the formal written method of short multiplication using all times tables facts.

Resources:

- Dienes
- Place Value Mats (Progressive)

Practical + Pictorial

121 x 4 = 484

119 x 4 = 476

456 x 7 = 3192

Abstract

Short Method
3 x 1 examples

121 x 4 = 484

```
    1 2 1
x       4
  _____
    4 8 4
```

119 x 4 = 476

```
    1 1 9
x       4
  _____
    4 7 6
      3
```

456 x 7 = 3192

```
    4 5 6
x       7
  _____
  3 1 9 2
  3 3 4
```

Multiplication Formal Written Methods for Calculation

Multiplication

Year 5

Multiply numbers up to 4 digits by a 1 or 2 digit number using a formal written method, including long multiplication for 2 digit numbers.

Resources:

- Place Value Mats (Progressive)

Practical + Pictorial

a)   1234 x 4 = 4936

Millions			Thousands			Hundreds, Tens and Ones		
Hundred Millions 100 000 000	Ten Millions 10 000 000	Millions 1 000 000	Hundred thousands 100 000	Ten thousands 10 000	Thousands 1 000	Hundreds 100	Tens 10	Ones 1
					1	2	3	4
								4
					4	9	3	6
							1	1

x

b)   24 x 16 = 384

Millions			Thousands			Hundreds, Tens and Ones		
Hundred Millions 100 000 000	Ten Millions 10 000 000	Millions 1 000 000	Hundred thousands 100 000	Ten thousands 10 000	Thousands 1 000	Hundreds 100	Tens 10	Ones 1
							2	4
							1	6
						1	4	4
							2	
						2	4	0
						3	8	4

x

Abstract

Short Method
4 x 1 example

1234 x 4 = 4936

```
      1   2   3   4
  x               4
  _____
      4   9   3   6
  _____
              1   1
```

Long Multiplication
2 x 2 example

24 x 16 = 384

```
              2   4
      x       1   6
      _____
          1   4   4
                  2
  +       2   4   0
      _____
          3   8   4
      _____
```

Multiplication Formal Written Methods for Calculation

Year 6

National curriculum expectations

Multiply multi-digit numbers up to 4 digits by a 2 digit whole number using the formal written method of long multiplication.

Multiply 1 digit numbers with up to 2 decimal places by whole numbers.

Resources:

- Place Value Mats (Progressive)

Practical + Pictorial

a) 124 x 26 = 3224

b) 3.44 x 6 = 20.64

c) 4243 x 32 = 135,776

Abstract

Long Multiplication
3 x 2 example

124 x 26 = 3224

$$
\begin{array}{r}
1\ 2\ 4 \\
\times\ \ \ 2\ 6 \\
\hline
7\ 4\ 4 \\
\ \ \ 2 \\
+\ \ 2\ 4\ 8\ 0 \\
\hline
3\ 2\ 2\ 4 \\
\hline
1\ \ 1
\end{array}
$$

Multiplying decimals (Short method)

$$
\begin{array}{r}
3\ .\ 4\ 4 \\
\times\ \ \ \ \ \ \ 6 \\
\hline
2\ 0\ .\ 6\ 4 \\
\hline
2\ \ \ \ 2
\end{array}
$$

Long Multiplication
4 x 2 example

$$
\begin{array}{r}
4\ 2\ 4\ 3 \\
\times\ \ \ \ \ 3\ 2 \\
\hline
8\ 4\ 8\ 6 \\
+\ 1\ 2\ 7\ 2\ 9\ 0 \\
1 \\
\hline
1\ 3\ 5\ 7\ 7\ 6 \\
\hline
1\ \ \ \ \ 1
\end{array}
$$

Multiplication Formal Written Methods for Calculation

Multiplication

Year 2

Calculate mathematical statements for multiplication within the multiplication tables and write them using the signs x and =

Number Statements

6 x 5 = 30
5 x 6 = 30

8 x 2 = 16
2 x 8 = 16

Year 3

Multiply 2 numbers by a 1 digit number using a formal written layout.

Pupils practise to become fluent in the formal written method of short multiplication using the times tables they know.

Short Method
2 x 1 examples

21 x 4 = 84

```
    2  1
x      4
-------
    8  4
```

14 x 5 = 70

```
    1  4
x      5
-------
    7  0
    2
```

34 x 8 = 272

```
    3  4
x      8
-------
 2  7  2
    2  3
```

Year 4

Multiply 2 and 3 digit numbers by a 1 digit number using a formal written layout.

Pupils consolidate their fluency in the formal written method of short multiplication using all times tables facts.

Short Method
3 x 1 examples

121 x 4 = 484

```
    1  2  1
x         4
----------
    4  8  4
```

119 x 4 = 476

```
    1  1  9
x         4
----------
    4  7  6
          3
```

456 x 7 = 3192

```
       4  5  6
x            7
-------------
    3  1  9  2
    3  3  4
```

Year 5 and Year 6

Multiply numbers up to 4 digits by a 1 or 2 digit number using a formal written method, including long multiplication for 2 digit numbers.

Short Method
4 x 1 example

```
    1  2  3  4
x            4
-------------
    4  9  3  6
       1  1
```

Multiplying decimals (Short method)

```
    3  .  4  4
x            6
-------------
 2  0  .  6  4
    2     2
```

Long Multiplication
2 x 2 example

```
       2  4
x      1  6
----------
    1  4  4
       2
+   2  4  0
----------
    3  8  4
```

Multiply multi-digit numbers up to 4 digits by a 2 digit whole number using the formal written method of long multiplication.

Multiply 1 digit numbers with up to 2 decimal places by whole numbers.

Long Multiplication
3 x 2 example

```
       1  2  4
x         2  6
-------------
       7  4  4
       1  2
+   2  4  8  0
-------------
    3  2  2  4
       1  1
```

4 x 2 example

```
    4  2  4  3
x         3  2
-------------
    8  4  8  6
+ 1 2  7  2  9  0
       1
-------------
  1 3  5  7  7  6
       1     1
```

Division Formal Written Methods for Calculation

Year 3

National curriculum expectations

Write and calculate mathematical statements for division using the multiplication tables that they know, including for 2 digit numbers times 1 digit numbers.

Pupils develop reliable written methods for division starting with calculations of 2 digit by 1 digit and progression to the formal written methods of short division.

Resources:

- Dienes

Practical + Pictorial

a)

$69 \div 3 = 23$

1000s	100s	10s	1s

$69 \div 3 = 23$

$65 \div 5 = 13$

1000s	100s	10s	1s

$65 \div 5 = 13$

Abstract

Short Method: 2 x 1 examples

$69 \div 3 = 23$

$$\begin{array}{r} 2 \quad 3 \\ 3 \overline{) 6 \quad 9} \end{array}$$

$65 \div 5 = 13$

$$\begin{array}{r} 1 \quad 3 \\ 5 \overline{) 6 \quad {}^15} \end{array}$$

$92 \div 4 = 23$

$$\begin{array}{r} 2 \quad 3 \\ 4 \overline{) 9 \quad {}^12} \end{array}$$

Year 4

Division
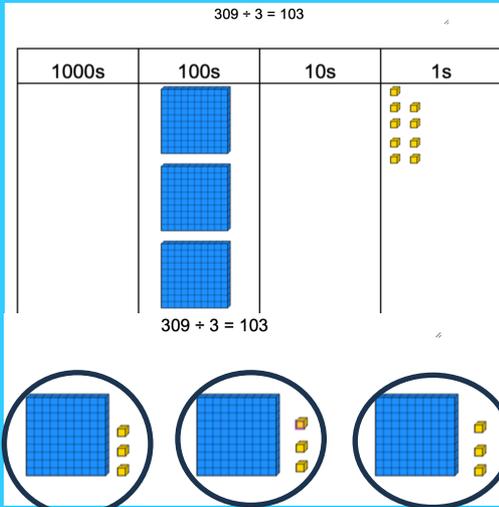
National curriculum expectations

Pupils practise to become fluent in the formal written method of short division with exact answers. (Up to 3 by 1)

Resources:

- Dienes

Practical + Pictorial

a) 309 ÷ 3 = 103

309 ÷ 3 = 103

1000s	100s	10s	1s

309 ÷ 3 = 103

b) 294 ÷ 3 = 98

294 ÷ 3 = 98

1000s	100s	10s	1s
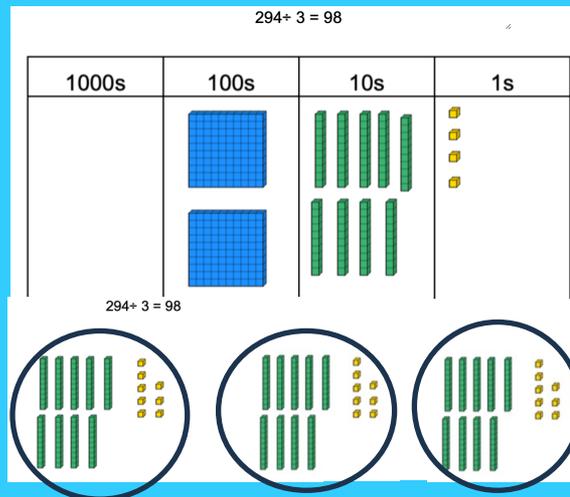
294 ÷ 3 = 98

Abstract

Short Method: 3 x 1 examples

309 ÷ 3 = 103

$$\begin{array}{r} 1\ \ 0\ \ 3 \\ 3\overline{)\ 3\ \ 0\ \ 9} \end{array}$$

896 ÷ 4 = 224

$$\begin{array}{r} 2\ \ 2\ \ 4 \\ 4\overline{)\ 8\ \ 9\ \ {}^16} \end{array}$$

294 ÷ 3 = 98

$$\begin{array}{r} 0\ \ 9\ \ 8 \\ 3\overline{)\ 2\ \ {}^29\ \ {}^24} \end{array}$$

Year 5

National curriculum expectations

Division

Divide numbers up to 4 digits by a 1 digit number using the formal written method of short division and interpret remainders appropriately for the context.

Resources:

- Dienes
- Place Value Mats (Progressive)

Practical + Pictorial

a)

$4293 ÷ 9 = 477$

1000s	100s	10s	1s

b)

Hundreds, Tens and Ones				Decimals		
Hundreds 100	Tens 10	Ones 1		Tenths 0.1	Hundredths 0.01	Thousandths 0.001
	9	1	.	2	0	
5	4	5	6 .	0	0	
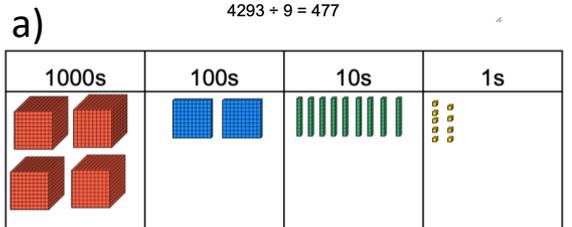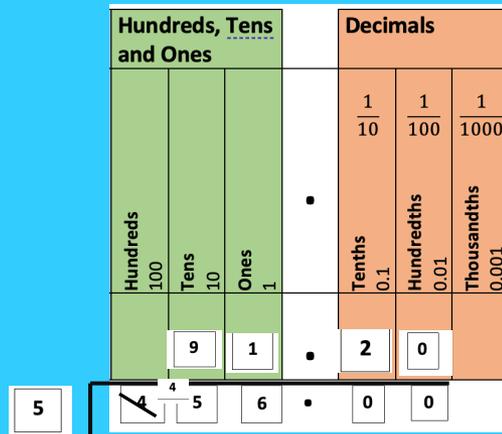
Abstract

Short Method
4 x 1 example

$4293 ÷ 9 = 477$

$$\begin{array}{c c c c c} & 0 & 4 & 7 & 7 \\ \hline 9 & 4 & {}^4 2 & {}^6 9 & {}^6 3 \end{array}$$

Short Method that will have a decimal remainder
e.g. £456 ÷ 5 = £91.20

$$\begin{array}{c c c c c c} & 0 & 9 & 1 & . & 2 \\ \hline 5 & 4 & {}^4 5 & 6 & . & {}^1 0 \end{array}$$

£456 ÷ 5 = £91.2**0**

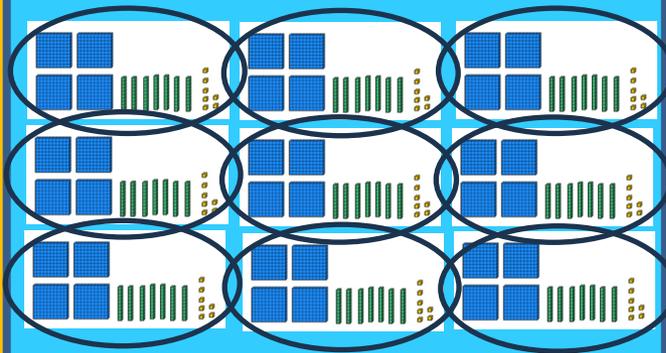Additional place holder for the quotient as money always has 2 decimal places.

Division

Year 6

Divide numbers up to 4 digits by a 2 digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context.

Divide numbers up to 4 digits by a 2 digit number using the formal written method of short division where appropriate, interpreting remainders according to the context.

Pupils are introduced to the division of decimal numbers by 1 digit whole number, initially, in practical contexts involving measures and money.

Resources:

- Dienes
- Place Value Mats (Progressive)

Practical + Pictorial

Thousands			Hundreds, Tens and Ones		
Hundred thousands 100 000	Ten thousands 10 000	Thousands 1 000	Hundreds 100	Tens 10	Ones 1
			3	2	2

15 | 4 | 8 | 3 | 2

− 4 | 5

3 | 3

− 3 | 0

3 | 2

− 3 | 0

2

Tens 10	Ones 1		Tenths 0.1	Hundredths 0.01	Thousandths 0.001
	1	.	2	5	

8 | 1 . 0 | 2 0 4 0

Abstract

Long Division 4 x 2 example
$4832 \div 15 = 322 \text{ r } 2$

$$
\begin{array}{r}
3\ 2\ 2 \\
15\ \overline{)\ 4\ 8\ 3\ 2} \\
-\ 4\ 5 \\
\hline
3\ 3 \\
-\ 3\ 0 \\
\hline
3\ 2 \\
-\ 3\ 0 \\
\hline
2
\end{array}
$$

Short Division 4 x 2 example
$4268 \div 22 = 194$

$$
\begin{array}{r}
0\ 1\ 9\ 4 \\
22\ \overline{)\ 4\ {}^4 2\ {}^{20}6\ {}^8 8}
\end{array}
$$

Short Method decimal by single digit
$267.75 \div 5 = 53.55$

$$
\begin{array}{r}
0\ 5\ 3\ .\ 5\ 5 \\
5\ \overline{)\ 2\ {}^2 6\ {}^1 7\ .\ {}^2 7\ {}^2 5}
\end{array}
$$

Short Method Whole number by single digit with decimal quotient
$10 \div 8 = 1.25$

Additional place holders needed here.

$$
\begin{array}{r}
0\ 1\ .\ 2\ 5 \\
8\ \overline{)\ 1\ {}^1 0\ .\ {}^2 0\ {}^4 0}
\end{array}
$$

Division Formal Written Methods for Calculation

Division

National curriculum expectations

Year 2

Calculate mathematical statements for division within the multiplication tables and write them using the signs ÷ and =

Number Statements

$6 ÷ 2 = 3$

$20 ÷ 5 = 4$

$18 ÷ 2 = 9$

Year 3

Write and calculate mathematical statements for division using the multiplication tables that they know, including for 2 digit numbers times 1 digit numbers.

Pupils develop reliable written methods for division starting with calculations of 2 digit by 1 digit and progression to the formal written methods of short division.

Short Method: 2 x 1 example

$92 ÷ 4 = 23$

```
      2   3
  4 | 9  ¹2
```

Year 4

Pupils practise to become fluent in the formal written method of short division with exact answers.

Short Method: 3 x 1 example

$294 ÷ 3 = 98$

```
      0   9   8
  3 | 2  ²9  ²4
```

Year 5

Divide numbers up to 4 digits by a 1 digit number using the formal written method of short division and interpret remainders appropriately for the context.

Short Method 4 x 1 example

$4293 ÷ 9 = 477$

```
      0   4   7   7
  9 | 4  ⁴2  ⁶9  ⁶3
```

Short Method that will have a decimal remainder e.g. £456 ÷ 5 = £91.20

```
      0   9   1  .   2
  5 | 4  ⁴5  6  .  ¹0
```

£456 ÷ 5 = £91.20

Additional place holder for the quotient as money always has 2 decimal places.

Year 6

Divide numbers up to 4 digits by a 2 digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context.

Divide numbers up to 4 digits by a 2 digit number using the formal written method of short division where appropriate, interpreting remainders according to the context.

Pupils are introduced to the division of decimal numbers by 1 digit whole number, initially, in practical contexts involving measures and money.

$10 ÷ 8 = 1.25$

Additional place holders needed here.

Long Division 4 x 2 example

$4832 ÷ 15 = 322 \text{ r } 2$

```
              3   2   2
      15 | 4  8   3   2
         -  4  5
            ─────
            3   3
          -  3   0
             ─────
             3   2
           -   3   0
               ─────
                   2
```

Short Division 4 x 2 example

$4268 ÷ 22 = 194$

```
        0   1   9   4
  22 | 4  ⁴2  ²⁰6  ⁸8
```

Short Method Decimal by single digit

$267.75 ÷ 5 = 53.55$

```
     0   5   3  .   5   5
  5 | 2  ²6  ¹7  .  ²7  ²5
```

Short Method Whole number by single digit with decimal quotient

```
     0   1  .   2   5
  8 | 1  ¹0  .  ²0  ⁴0
```