Pensans' Written Method Calculation Policy

Written September 2023

Review September 2024

Addition Formal Written Methods For Calculation

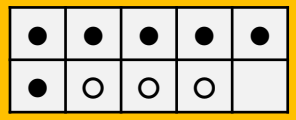
Year 1

National curriculum expectations

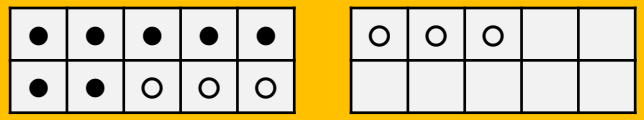
Add two one-digit numbers and a two-digit and one-digit number with a total less than 20.

- 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.

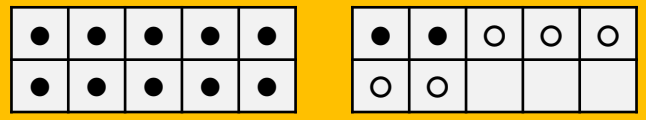
Example: 6 + 3 = 9



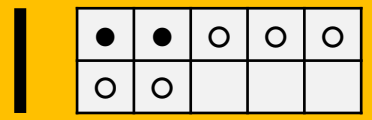
Example: 7 + 6 = 13



Example (two frames): 12 + 5 = 17



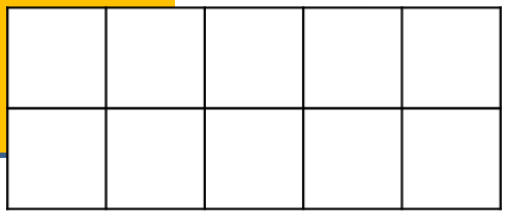
Example (tens and ones): 12 + 5 = 17



Resources:

- Tens Frames
- Two sided counters
- Dienes

Practical first!



Addition

Addition Formal Written Methods for Calculation

Addition

Year 2

National curriculum expectations

Add ones to a two-digit number.

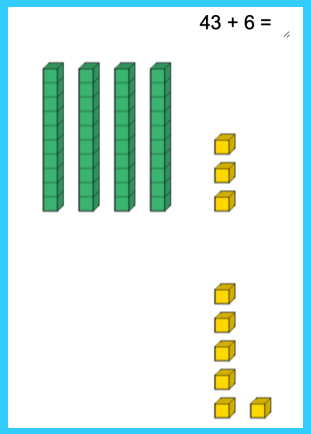
Add tens to a two-digit number.

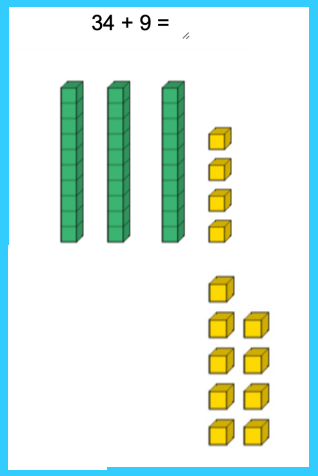
Add one two-digit number to another.

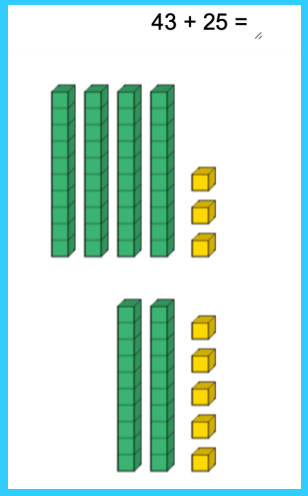
Resources:

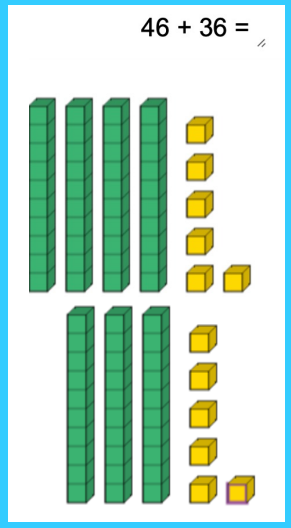
- Dienes

Practical + Pictorial









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 Formal Written Methods for Calculation

Year 3

National curriculum expectations

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

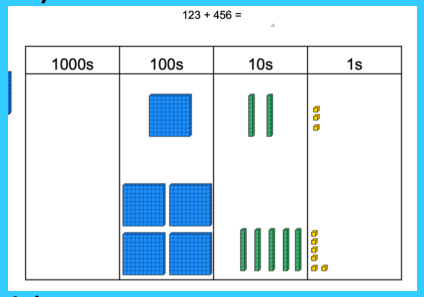
Resources:

- Dienes

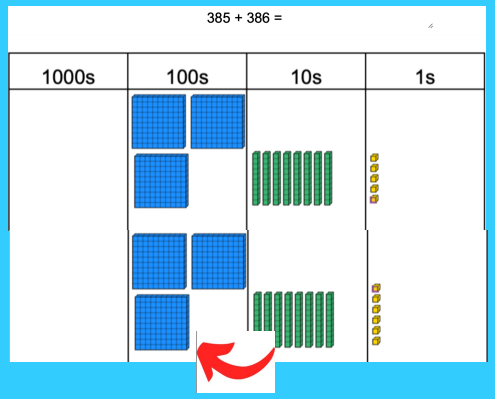
Addition

Practical + Pictorial

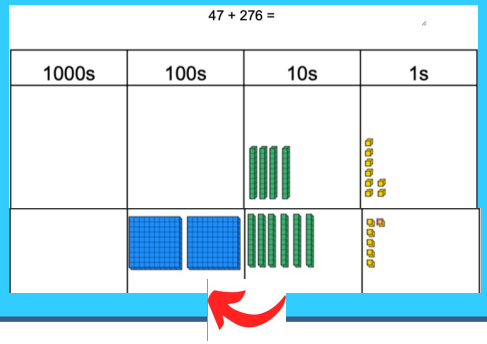
a) 123 + 456 = 579



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~~	

Addition Formal Written Methods for Calculation

Year 4

National curriculum expectations

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

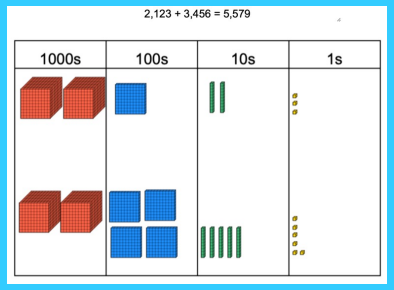
Resources:

- Dienes
- Place Value Mats (Progressive)

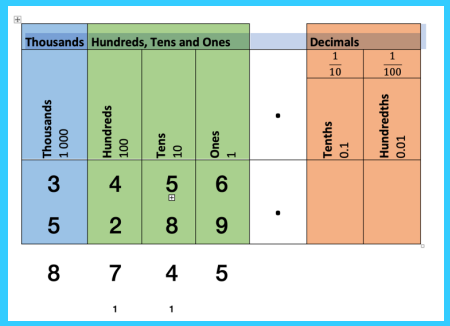
Addition

Practical + Pictorial

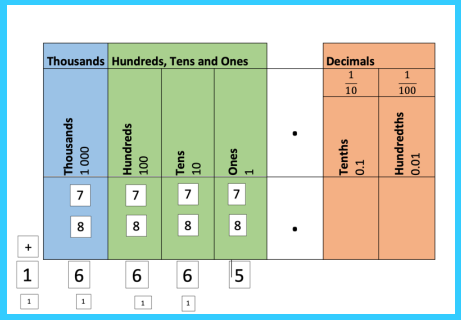
a) 2,123 + 3,456 = 5,579



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

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

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

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

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

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

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

Addition Formal Written Methods for Calculation

National curriculum expectations

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.

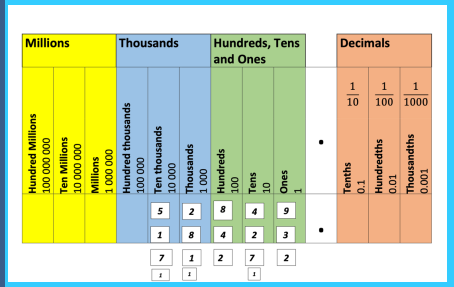
Resources:

Place Value Mats (Progressive)

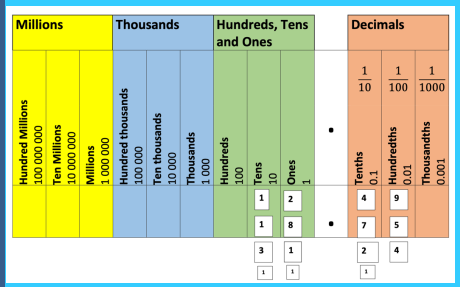
Addition

Practical + Pictorial

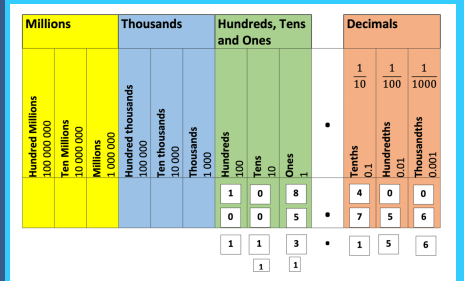
a) 52,849 + 18,423 = 71,272



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

Addition

National curriculum expectations

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.

Subtraction Formal Written Methods For Calculation

Year 1

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

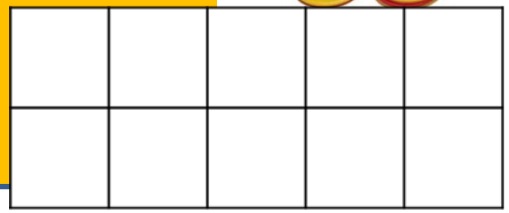
National curriculum expectations

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

Resources:

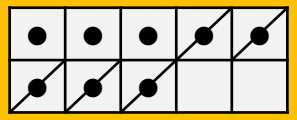
- Tens Frames
- Two sided counters
- Dienes

Practical first!



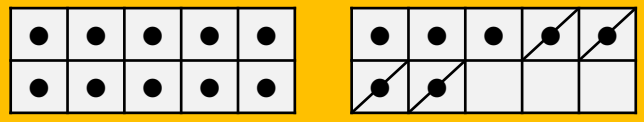
Subtraction

One-digit subtract one-digit Example: 8 – 5 = 3



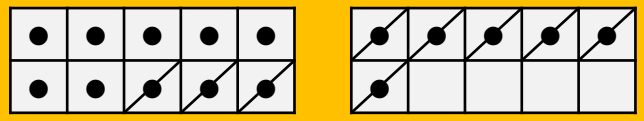
Two-digit subtract one-digit (not crossing ten)

Example: 17 – 4 = 13



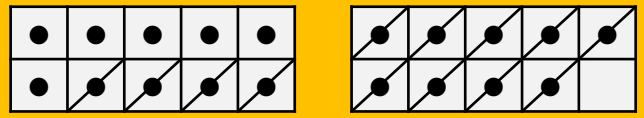
Two-digit subtract one-digit (crossing ten)

Example: 16 – 9 = 7



Two-digit subtract two-digit

Example: 19 – 13 = 6



Subtraction Formal Written Methods for Calculation

Subtraction

National curriculum expectations

Year 2

Subtract ones from a two-digit number.

Subtract tens from a two-digit number.

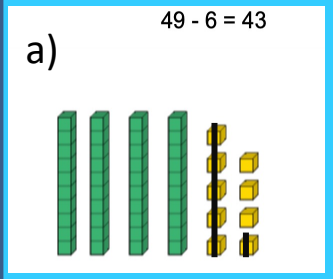
Subtract one two-digit number from another.

Resources:

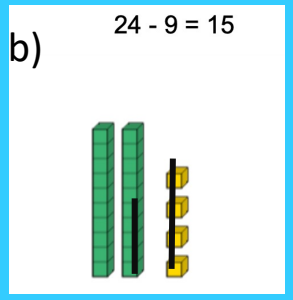
- Dienes

Practical + Pictorial

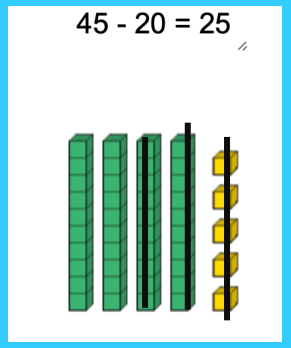
a)



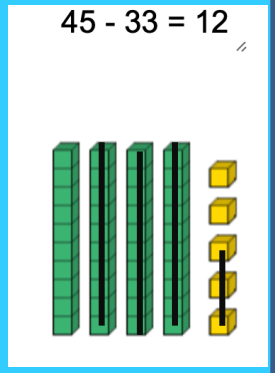
b)



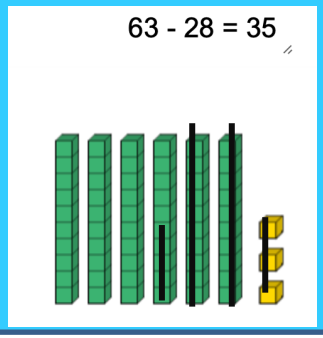
c)



d)



e)



Abstract

Short Column Written Method

Two-digit - single digit (not breaking 10)

a) 49 - 6 = 43

	4	9
-	0	6
	4	3

Two-digit - single digit (breaking 10)

b) 34 - 9 = 25

	~~3~~ ^{2}	^{1}4
-	0	9
	2	5

Two-digit - tens

c) 45 - 20 = 25

	4	5
-	2	0
	2	5

Two-digit - two-digit (not breaking 10)

d) 45 - 33 = 12

	4	5
-	3	3
	1	2

Two-digit - two-digit (breaking 10)

e) 63 - 28 = 35

	~~6~~ ^{5}	^{1}3
-	2	8
	3	5

Subtraction Formal Written Methods for Calculation

Year 3

National curriculum expectations

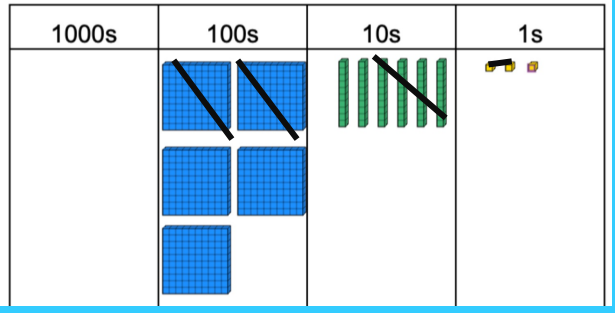
Subtract numbers with up to 3 digits using formal written methods of columnar subtraction.

Resources:

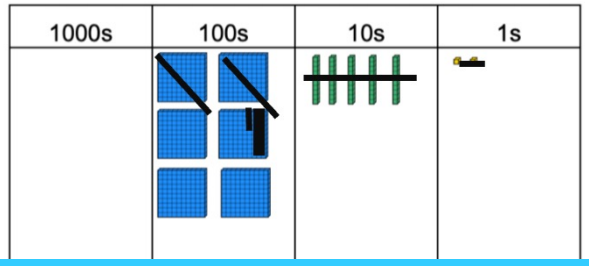
- Dienes

Practical + Pictorial

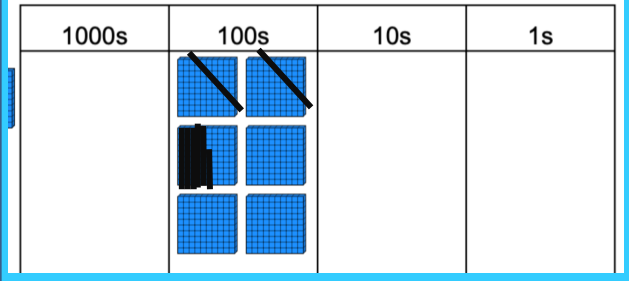
563 - 241 = 322



652 - 287 =



600 - 255 = 345



Abstract

Short Column Written Method

3-digit - 3-digit

563 – 241 = 322

$$\begin{array}{rrr} 5 & 6 & 3 \\ - \; 2 & 4 & 1 \\ \hline 3 & 2 & 2 \end{array}$$

652 - 287 = 365

$$\begin{array}{rrr} {}^{5}\not{6} & {}^{14}\not{5} & {}^{1}2 \\ - \; 2 & 8 & 7 \\ \hline 3 & 6 & 5 \end{array}$$

600 – 255 = 345

$$\begin{array}{rrr} {}^{5}\not{6} & {}^{9}{}^{1}\not{0} & {}^{1}0 \\ - \; 2 & 5 & 5 \\ \hline 3 & 4 & 5 \end{array}$$

Don't forget mixed digit whole number questions

Subtraction

Subtraction Formal Written Methods for Calculation

Year 4

National curriculum expectations

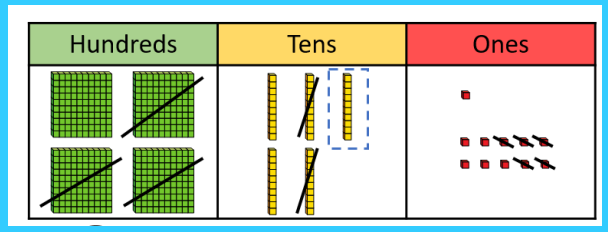
Subtract numbers with up to 4 digits using the formal written methods of columnar subtraction.

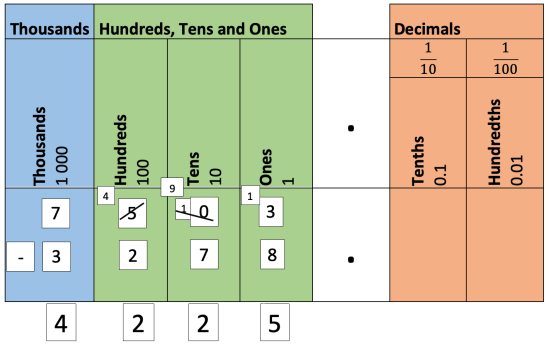
Resources:

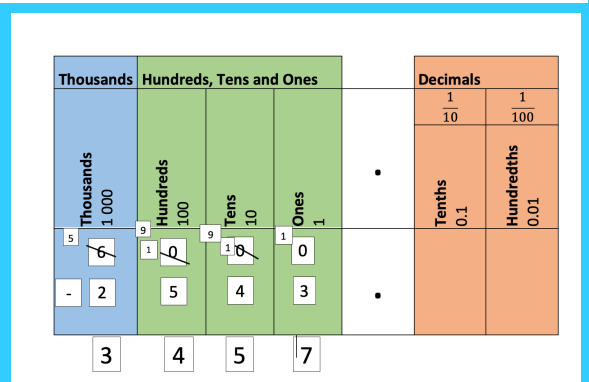
- Dienes
- Place Value Mats (Progressive)

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

	7	~~5~~ 4	~~0~~ 9	13
-	3	2	7	8
	4	2	2	5

c) 6,000 – 2,543 = 3,457

	~~6~~ 5	~~0~~ 9	~~0~~ 9	10
-	2	5	4	3
	3	4	5	7

Don't forget mixed digit whole number questions

Subtraction

Subtraction Formal Written Methods for Calculation

Year 5 + 6

Subtraction

National curriculum expectations

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

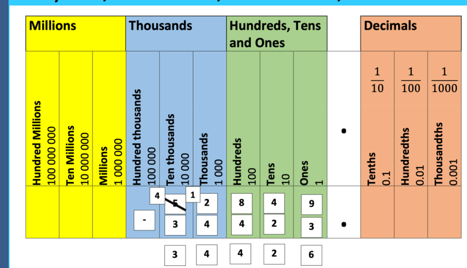
Practise subtracting decimals, including a mix of whole numbers and decimals, followed by decimals with different numbers of decimal places.

Resources:

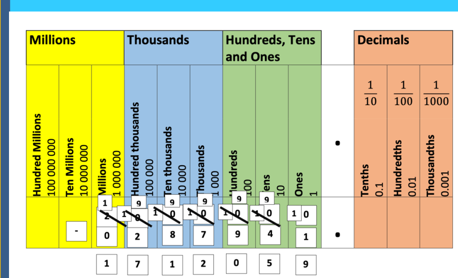
- Dienes
- Place Value Mats (Progressive)

Practical + Pictorial

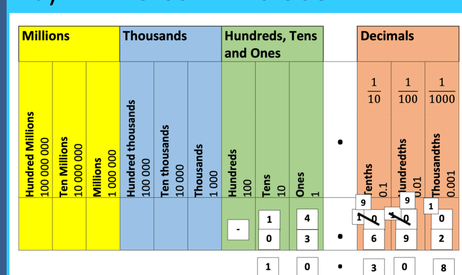
a) 52,849 - 18,423 = 34,426



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

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

b) 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

c) 63.75 – 17.28 = 46.47

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

d) 14 – 3.692 = 10.308

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

Don't forget mixed digit whole number questions

Subtraction Formal Written Methods for Calculation

Subtraction

National curriculum expectations

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

$$\begin{array}{r} 7\ 4 \\ -\ 2\ 3 \\ \hline 5\ 1 \end{array}$$

63 – 48 = 15

$$\begin{array}{r} {\scriptstyle 5}\ \ \\ \cancel{6}\ {}^{1}3 \\ -\ 4\ 8 \\ \hline 1\ 5 \end{array}$$

Year 3

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

3-digit - 3-digit

563 – 241 = 322

$$\begin{array}{r} 5\ 6\ 3 \\ -\ 2\ 4\ 1 \\ \hline 3\ 2\ 2 \end{array}$$

652 - 287 = 365

$$\begin{array}{r} {\scriptstyle 5}\ {\scriptstyle 14}\ \ \\ \cancel{6}\ \cancel{5}\ {}^{1}2 \\ -\ 2\ 8\ 7 \\ \hline 3\ 6\ 5 \end{array}$$

600 – 255 = 345

$$\begin{array}{r} {\scriptstyle 5}\ {\scriptstyle 9}\ \ \\ \cancel{6}\ {}^{1}\cancel{0}\ {}^{1}0 \\ -\ 2\ 5\ 5 \\ \hline 3\ 4\ 5 \end{array}$$

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

$$\begin{array}{r} 8\ 4\ 6\ 9 \\ -\ 2\ 1\ 2\ 7 \\ \hline 6\ 3\ 4\ 2 \end{array}$$

7,503 – 3,278 = 4,225

$$\begin{array}{r} \ \ {\scriptstyle 4}\ {\scriptstyle 9}\ \ \\ 7\ \cancel{5}\ {}^{1}\cancel{0}\ {}^{1}3 \\ -\ 3\ 2\ 7\ 8 \\ \hline 4\ 2\ 2\ 5 \end{array}$$

6,000 – 2,543 = 3,457

$$\begin{array}{r} {\scriptstyle 5}\ {\scriptstyle 9}\ {\scriptstyle 9}\ \ \\ \cancel{6}\ {}^{1}\cancel{0}\ {}^{1}\cancel{0}\ {}^{1}0 \\ -\ 2\ 5\ 4\ 3 \\ \hline 3\ 4\ 5\ 7 \end{array}$$

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

$$\begin{array}{r} \ \ {\scriptstyle 4}\ \ \ \ \\ \cancel{5}\ {}^{1}2\ 8\ 4\ 9 \\ -\ 1\ 8\ 4\ 2\ 3 \\ \hline 3\ 4\ 4\ 2\ 6 \end{array}$$

2,000,000 – 287, 941 = 1,712,059

$$\begin{array}{r} {\scriptstyle 1}\ {\scriptstyle 9}\ {\scriptstyle 9}\ {\scriptstyle 9}\ {\scriptstyle 9}\ {\scriptstyle 9}\ \ \\ \cancel{2}\ {}^{1}\cancel{0}\ {}^{1}\cancel{0}\ {}^{1}\cancel{0}\ {}^{1}\cancel{0}\ {}^{1}\cancel{0}\ {}^{1}0 \\ -\ 0\ 2\ 8\ 7\ 9\ 4\ 1 \\ \hline 1\ 7\ 1\ 2\ 0\ 5\ 9 \end{array}$$

Add in place holders to 'box' the subtraction.

With decimals

63.75 – 17.28 = 46.47

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

14 – 3.692 = 10.308

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

Multiplication Formal Written Methods for Calculation

Multiplication

National curriculum expectations

Year 3

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

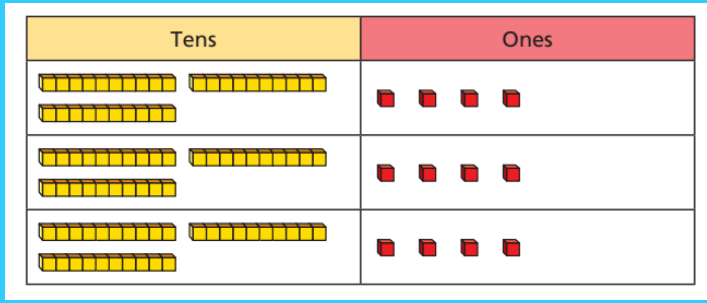
Pupils practise to become fluent in the formal written method of short multiplication using the times tables they know.

Resources:

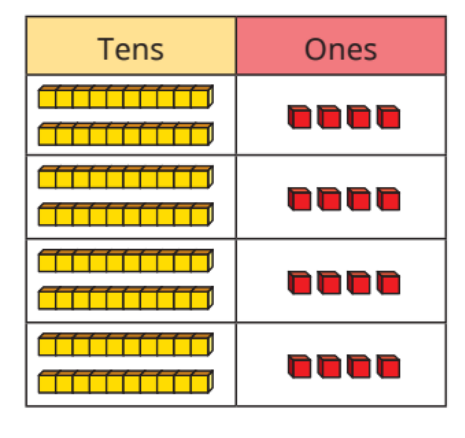
- Dienes

Practical + Pictorial

34 x 3 = 102



24 x 4 = 96



Abstract

Short Method
2 x 1 examples

21 x 4 = 84

$$\begin{array}{r} 2\ 1 \\ \times\quad 4 \\ \hline 8\ 4 \end{array}$$

14 x 5 = 70

$$\begin{array}{r} 1\ 4 \\ \times\quad 5 \\ \hline 7\ 0 \\ \not{2} \end{array}$$

34 x 8 = 272

$$\begin{array}{r} 3\ 4 \\ \times\quad 8 \\ \hline 2\ 7\ 2 \\ \not{2}\ \not{3} \end{array}$$

Multiplication Formal Written Methods for Calculation

Year 4

National curriculum expectations

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

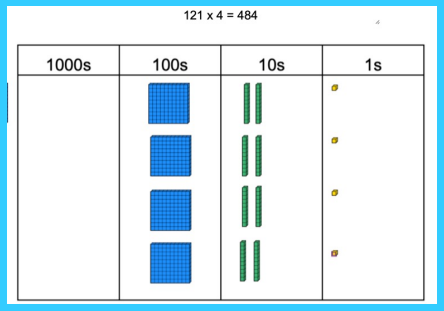
Pupils consolidate their fluency in the formal written method of short multiplication using all times tables facts.

Resources:

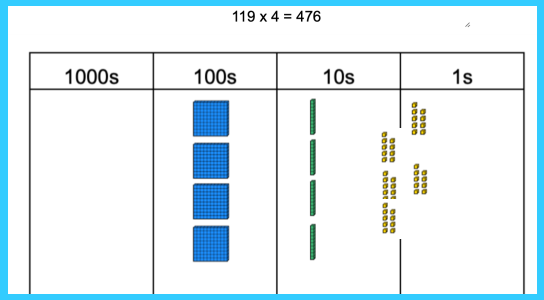
- Dienes
- Place Value Mats (Progressive)

Practical + Pictorial

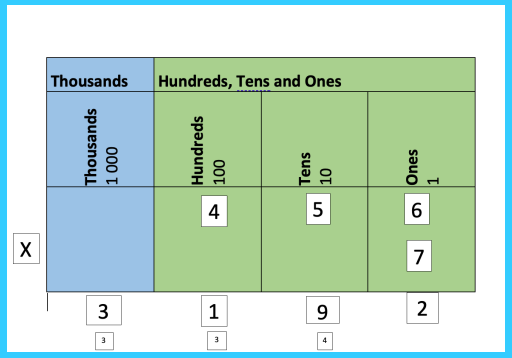
121 x 4 = 484



119 x 4 = 476



456 x 7 = 3192



Abstract

Short Method
3 x 1 examples

121 x 4 = 484

$$\begin{array}{r} 1\ 2\ 1 \\ \times \quad\ 4 \\ \hline 4\ 8\ 4 \end{array}$$

119 x 4 = 476

$$\begin{array}{r} 1\ 1\ 9 \\ \times \quad\ 4 \\ \hline 4\ 7\ 6 \\ \ \ \ 3 \end{array}$$

456 x 7 = 3192

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

Multiplication

Multiplication Formal Written Methods for Calculation

Year 5

National curriculum expectations

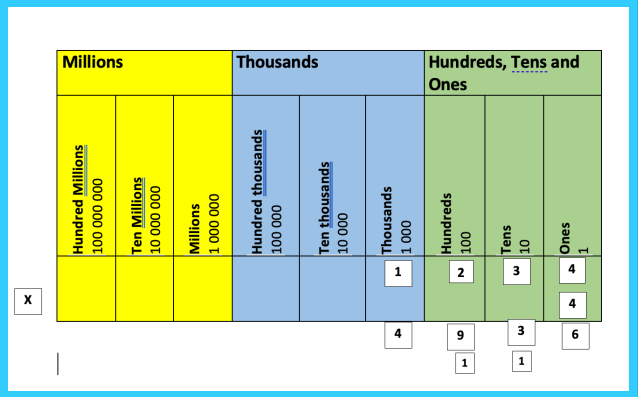
Multiply numbers up to 4 digits by a 1 or 2 digit number using a formal written method, including long multiplication for 2 digit numbers.

Resources:

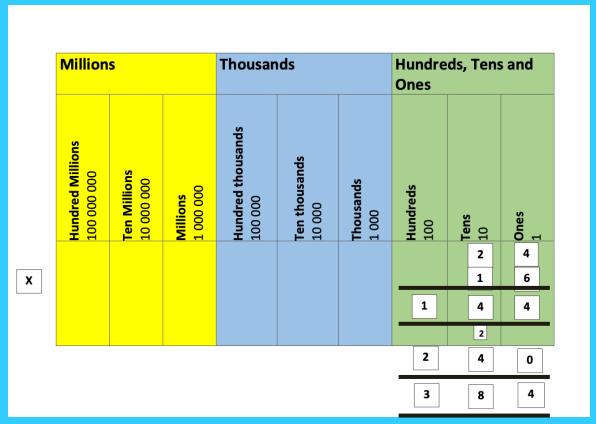
- Place Value Mats (Progressive)

Practical + Pictorial

a) 1234 x 4 = 4936



b) 24 x 16 = 384



Abstract

Short Method
4 x 1 example

1234 x 4 = 4936

	1	**2**	**3**	**4**
x				**4**
	4	9	3	6

Long Multiplication
2 x 2 example

24 x 16 = 384

		2	**4**
	x	**1**	**6**
	1	4	4
+	2	4	0
	3	8	4

Multiplication

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.

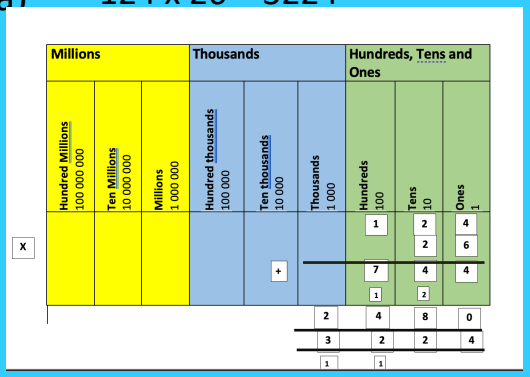
Resources:

- Place Value Mats (Progressive)

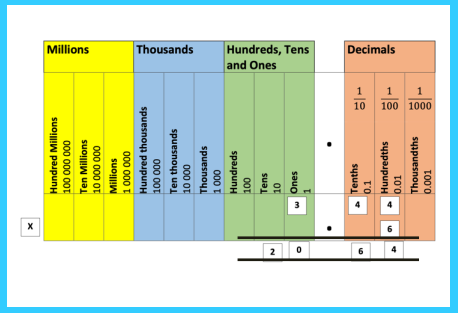
Multiplication

Practical + Pictorial

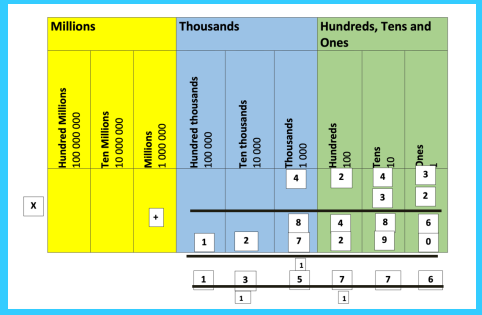
a) 124 x 26 = 3224



b) 3.44 x 6 = 20.64



c) 4243 x 32 = 135,776



Abstract

Long Multiplication 3 x 2 example

124 x 26 = 3224

		1	2	4
	x		2	6
		7	4	4
		~~1~~	~~2~~	
+	2	4	8	0
	3	2	2	4
	~~1~~	~~1~~		

Multiplying decimals (Short method)

		3	.	4	4
	x				6
	2	0	.	6	4
		~~2~~		~~2~~	

Long Multiplication 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~~			

Multiplication Formal Written Methods for Calculation

Multiplication

National curriculum expectations

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.

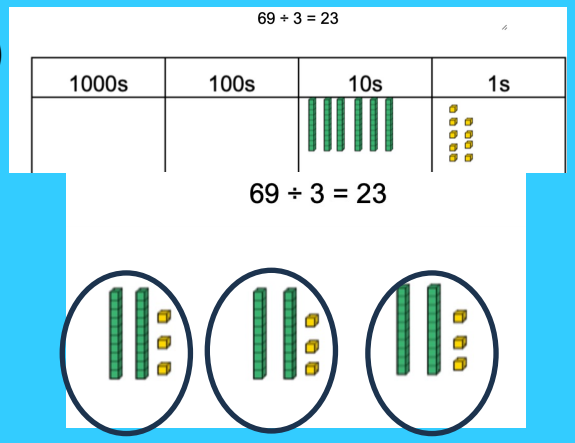
Resources:

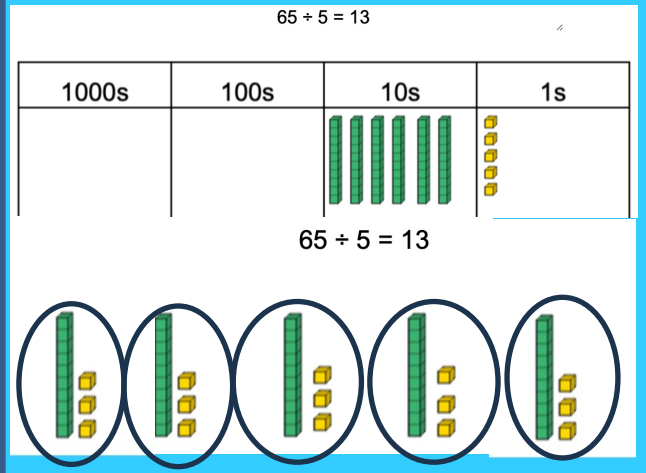
- Dienes

Division

Practical + Pictorial

a)





Abstract

Short Method: 2 x 1 examples

69 ÷ 3 = 23

	2	3
3	6	9

65 ÷ 5 = 13

	1	3
5	6	$^{1}5$

92 ÷ 4 = 23

	2	3
4	9	$^{1}2$

Division Formal Written Methods for Calculation

Year 4

National curriculum expectations

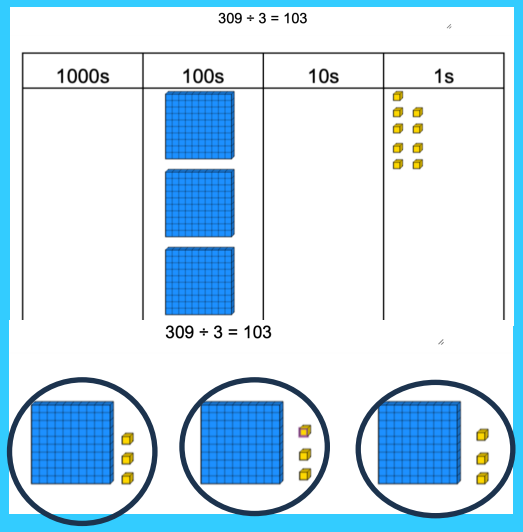
Pupils practise to become fluent in the formal written method of short division with exact answers. (Up to 3 by 1)

Resources:

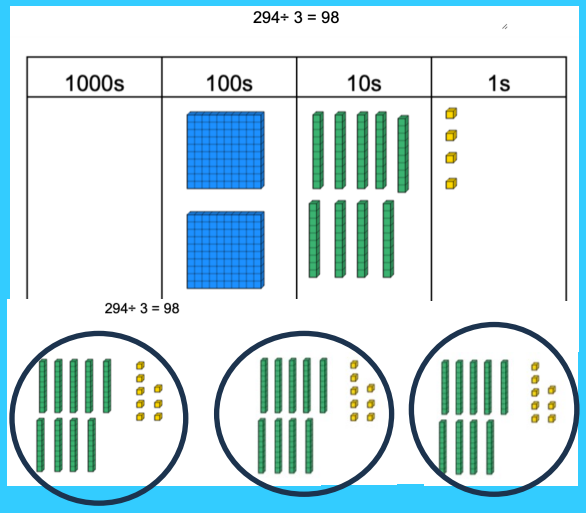
- Dienes

Practical + Pictorial

a) 309 ÷ 3 = 103



b) 294 ÷ 3 = 98



Abstract

Short Method: 3 x 1 examples

309 ÷ 3 = 103

	1	0	3
3	3	0	9

896 ÷ 4 = 224

	2	2	4
4	8	9	$^{1}6$

294 ÷ 3 = 98

	0	9	8
3	2	$^{2}9$	$^{2}4$

Division

Division Formal Written Methods for Calculation

Year 5

National curriculum expectations

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.

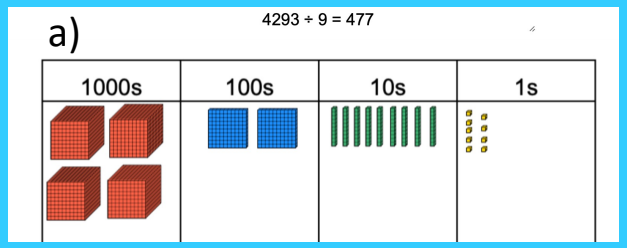
Resources:

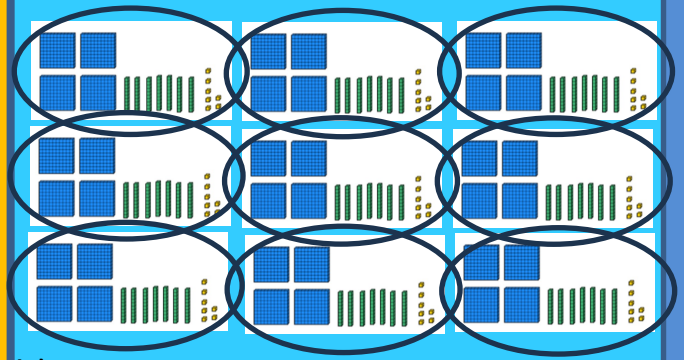
- Dienes
- Place Value Mats (Progressive)

Practical + Pictorial

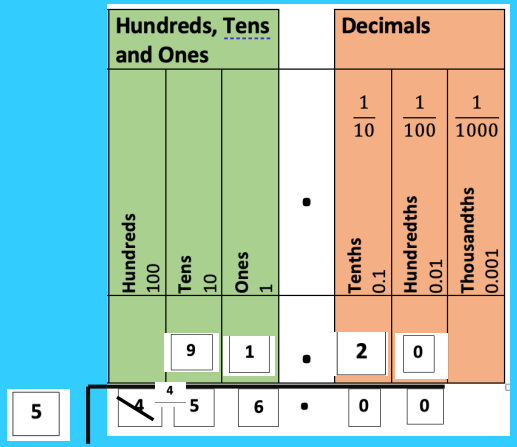
a)

4293 ÷ 9 = 477





b)



Abstract

Short Method
4 x 1 example

4293 ÷ 9 = 477

$$9\overline{)\,4\;{}^{4}2\;{}^{6}9\;{}^{6}3} \quad 0\;4\;7\;7$$

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

$$5\overline{)\,4\;{}^{4}5\;6\;.\;{}^{1}0} \quad 0\;9\;1\;.\;2$$

£456 ÷ 5 = £91.20

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

Division Formal Written Methods for Calculation

Year 6

National curriculum expectations

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.

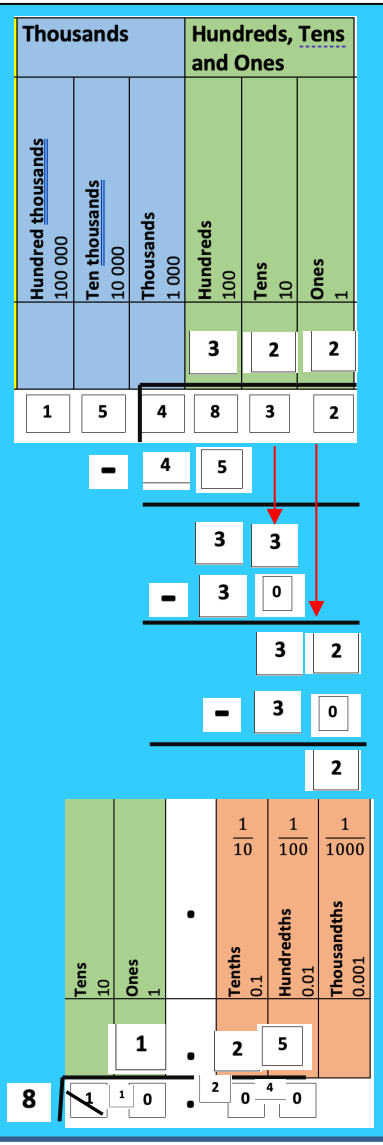
Pupils are introduced to the division of decimal numbers by 1 digit whole number, initially, in practical contexts involving measures and money.

Resources:

- Dienes
- Place Value Mats (Progressive)

Division

Practical + Pictorial



Abstract

Long Division 4 x 2 example
4832 ÷ 15 = 322 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
10 ÷ 8 = 1.25

```
        0   1   .   2   5
   ┌──────────────────
 8 │ 1  ¹0   .  ²0  ⁴0
```

Additional place holders needed here.

Division Formal Written Methods for Calculation

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	$^{1}2$

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	$^{2}9$	$^{2}4$

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	$^{4}2$	$^{6}9$	$^{6}3$

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

	0	9	1	.	2
5	4	$^{4}5$	6	.	$^{1}0$

£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 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	$^{4}2$	$^{20}6$	$^{8}8$

Short Method
Decimal by single digit

267.75 ÷ 5 = 53.55

	0	5	3	.	5	5
5	2	$^{2}6$	$^{1}7$	.	$^{2}7$	$^{2}5$

Short Method
Whole number by single digit with decimal quotient

	0	1	.	2	5
8	1	$^{1}0$	.	$^{2}0$	$^{4}0$

Division