



eastbury  
primary  
school  
*Succeeding together*

# CALCULATION POLICY

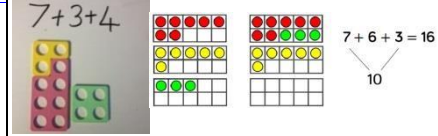
# Addition

Key language: sum, total, parts and wholes, plus, add, altogether, more, 'is equal to', 'is the same as' and exchanging.

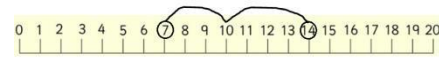
EYFS/Year1

2.1 Adding three single digits.

Using Numicon or ten frames.



Using pictures of ten frames or number line.  $7 + 3 + 4$

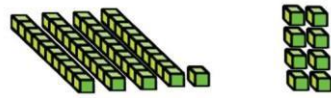


Use number bonds to make ten.

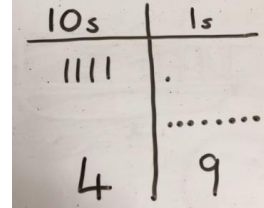
$$6 + 7 + 4 = 6 + 4 + 7 = 17$$

2.2 Use dienes to add two numbers.  
(2 digit + 1 digit and 2 digit + 2 digit)

Continue to develop understanding of partitioning and place value.  
 $41 + 8$



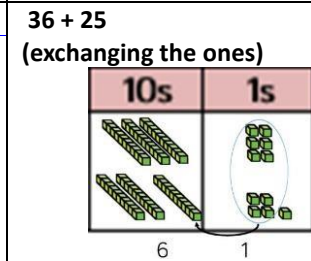
Children to represent the dienes e.g. lines for tens and dot/crosses for ones.



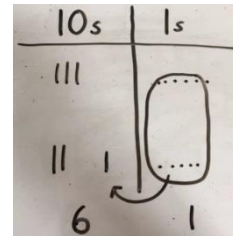
$$41 + 8$$

Add the ones:  $1 + 8 = 9$   
Add the tens:  $40 + 9 = 49$

2.3 Addition with exchanging using dienes  
(2 digit + 1 digit and 2 digit + 2 digit)



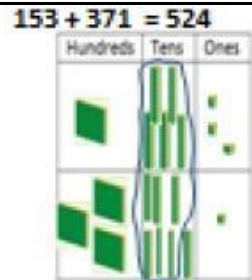
$$36 + 25$$



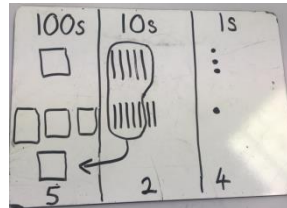
Introduce formal column method:

$$\begin{array}{r} 36 \\ +25 \\ \hline 61 \\ 1 \end{array}$$

3.1 Column method-exchanging (up to 3 digits).  
Using dienes.

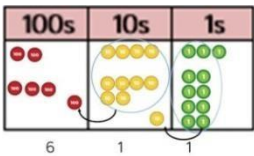
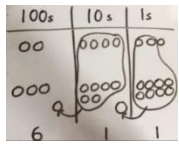
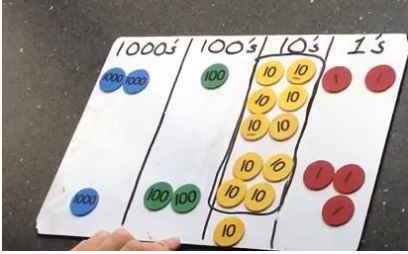
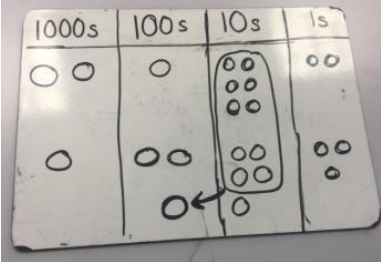
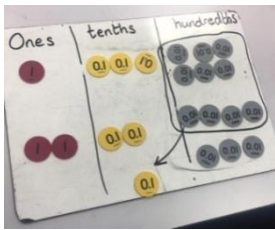
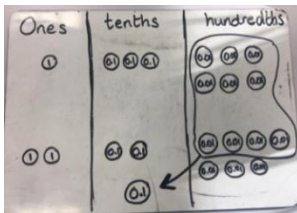


$$153 + 371 = 524$$



Introduce formal column method:

$$\begin{array}{r} 153 \\ +371 \\ \hline 524 \\ 1 \end{array}$$

	<p>3.2 Column method - <u>exchanging (up to 3 digits).</u> Using place value counters.</p>	 <p>243 + 368 = 611</p>	<p>243 + 368 = 611</p> 	$\begin{array}{r} 243 \\ +368 \\ \hline 611 \\ 1\ 1 \end{array}$
Year4	<p>4.1 Column method- <u>exchanging (up to 4 digits).</u> Using place value counters.</p>	<p>2162 + 1253</p> 	<p>2162 + 1253</p> 	$\begin{array}{r} 2162 \\ + 1253 \\ \hline 3515 \\ 1 \end{array}$
Year5	<p>5.1 Column method- <u>exchanging with more than 4 digits</u></p>	<p>See Year 4 if required.</p>	<p>See Year 4 if required.</p>	$\begin{array}{r} 1720\text{cm} \\ 750\text{cm} \\ + 1500\text{cm} \\ \hline 3970\text{cm} \\ 1 \end{array}$
	<p>5.2 Column method – <u>decimals (up to 2 d.p.).</u> Use place value counters.</p>	<p>1.36 + 2.37</p> 	<p>1.36 + 2.37</p> 	$\begin{array}{r} \text{£}1.36 \\ + \text{£}2.37 \\ \hline \text{£}3.73 \\ 1 \end{array}$

# Year6

6.1 Column method-  
exchanging with more  
than 4 digits

See Year 4 if required.

See Year 4 if required.

$$\begin{array}{r} 1720\text{cm} \\ 750\text{cm} \\ + 1500\text{cm} \\ \hline 3970\text{cm} \\ 1 \end{array}$$

6.2 Column method –  
decimals  
(up to 2 d.p.).  
Use place value counters.

See Year 5 if required.

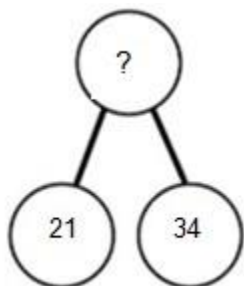
See Year 5 if required.

$$\begin{array}{r} \mathbf{\pounds 1.36} \\ + \mathbf{\pounds 2.37} \\ \hline \mathbf{\pounds 3.73} \\ 1 \end{array}$$

# Conceptual variation; different ways to ask children to solve 21 + 34

## Visual representations:

Part-part-whole diagrams and bar models.



?	
21	34

## Word problems:

In year 3, there are 21 children and in year 4, there are 34 children. How many children in total?

Calculate the sum of twenty-one and thirty-four.

## Different forms of equations:

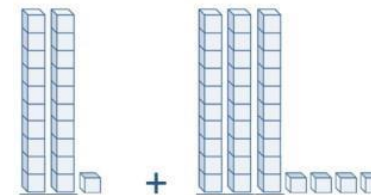
$$\begin{array}{r} 21 \\ +34 \\ \hline \end{array}$$

$$21 + 34 =$$

$$\square = 21 + 34$$

$21 + 34 = 55$ . Prove it

## Concrete representations:



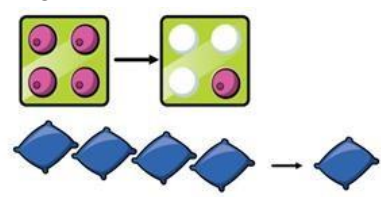
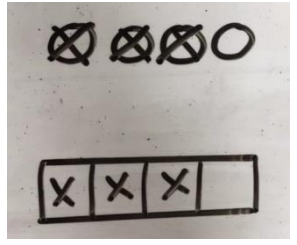
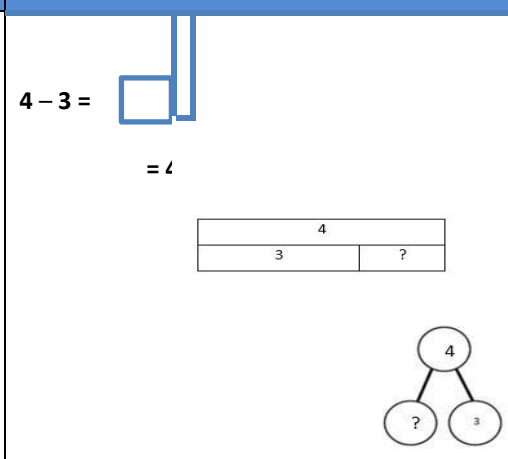
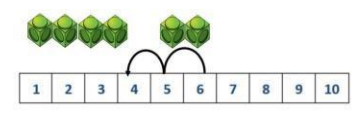
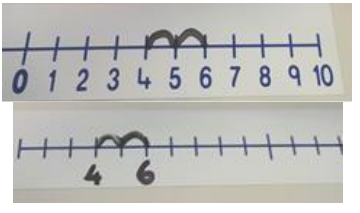
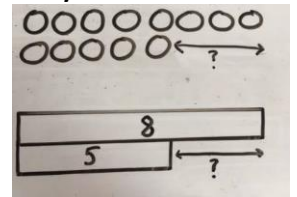
Missing digit problems:

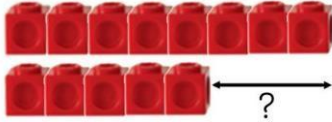
10s	1s
10 10	1
10 10 10	?
?	5

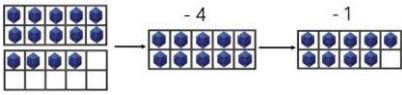
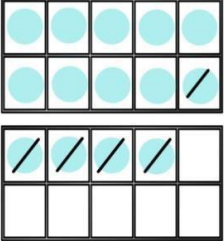
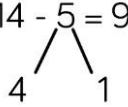

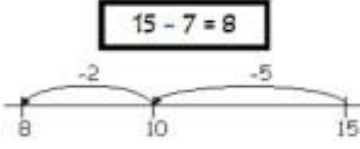
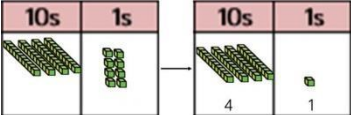
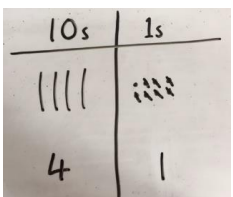
# Subtraction

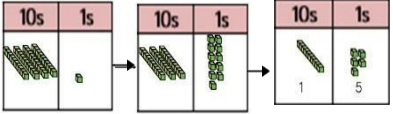
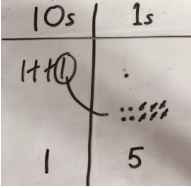
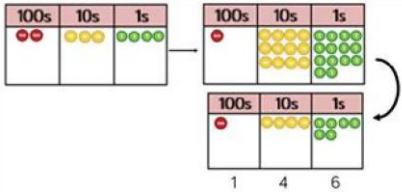
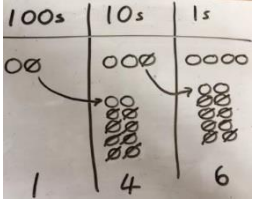
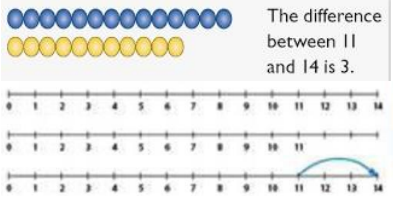
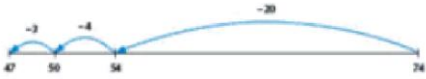
Key language: take away, less than, difference, subtract, minus, fewer, decrease and exchanging.

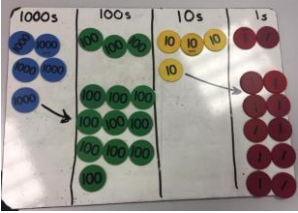
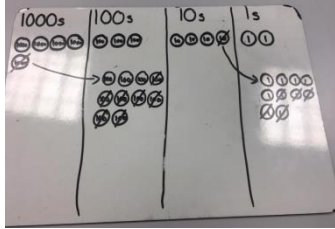
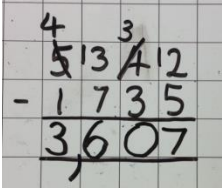
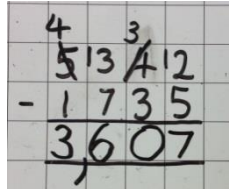
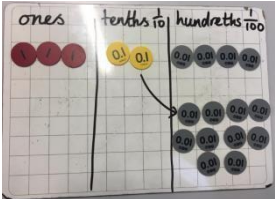
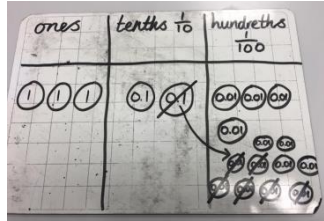
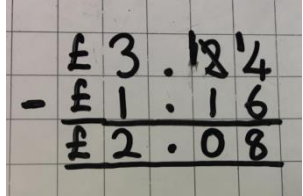
EYFS/Year1

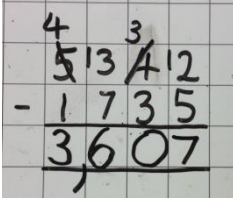
Progression	Concrete	Pictorial	Abstract
<p><b>1.4 Taking away ones from a whole.</b></p>	<p>Physically taking away objects from a whole.</p> <p><math>4 - 3 = 1</math></p> 	<p>Children to draw the concrete resources they are using and cross out the correct amount. The bar model can also be used.</p> 	<p><math>4 - 3 =</math></p> 
<p><b>1.5 Counting back using a number line.</b></p>	<p>Counting back (using number lines or number tracks) children start with 6 and count back 2.</p> <p><math>6 - 2 = 4</math></p> 	<p><math>6 - 2 = 4</math></p> 	<p><b><math>6 - 2 = 4</math></b></p>
<p><b>1.6 Find the difference by counting on.</b></p>	<p>Finding the difference (using cubes, Numicon or Cuisenaire rods).</p>	<p>Children to draw the concrete resources they have used or used a bar model to illustrate what they need to calculate.</p> 	<p>Find the difference between 8 and 5.</p> <p><b><math>5 + 3 = 8</math></b></p>

		 <p>Find the difference between 8 and 5.</p>		
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Year2	<p><a href="#">1.7 Make 10 using the ten frame</a></p>	<p>Making 10 using a ten frame. <math>14 - 5</math></p> 	<p>Children to present the ten frame pictorially and discuss what they did to make ten.</p> 	<p>Children to show how they can make ten by partitioning the smaller number.</p> $14 - 5 = 9$  <p><math>14 - 4 = 10</math> <math>10 - 1 = 9</math></p>
	<p><a href="#">2.4 Counting back using a number line.</a></p>	<p><math>15 - 7</math></p> 		<p><math>15 - 7 = 8</math></p>
	<p><a href="#">2.5 Use dienes to subtract numbers up to 2 digits (without exchanging).</a></p>	<p>Column method using dienes. <math>48 - 7</math></p> 	 <p>Children to represent dienes pictorially.</p>	<p><math>48 - 7 = 41</math></p>

	<p><b>2.6 Subtraction with exchanging using dienes</b></p> <p>(2 digit - 1 digit and 2 digit - 2 digit)</p>	<p>Column method using dienes. 41 - 26</p> 	<p>41-26</p> 	<p>Introduce formal column method:</p> $\begin{array}{r} 3 \\ \cancel{4}1 \\ - 26 \\ \hline 15 \end{array}$
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Year3</p>	<p><b>3.3 Column method with exchanging.</b></p> <p>Using place value counters and dienes up to 3 digits.</p>	<p>Column method using place value counters.</p> <p>234</p>  <p>88</p>	<p>234-88</p> 	<p>Formal column method.</p> $\begin{array}{r} 234 \\ - 88 \\ \hline 6 \end{array}$
	<p><b>3.4 Finding the difference</b></p>	<p>Begin to find the difference by</p>  <p>counting on or back.</p>	<p>74 - 47 = 27</p> 	<p><b>74 - 47 = 27</b></p>

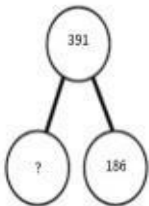
Year 4	<p>4.2 Column method with <a href="#">exchanging (including exchanging thousands, hundreds, tens and ones)</a>. Up to 4 digits using place value counters.</p>	<p>5342 – 1735</p> 	<p>5342 – 1735</p> 	<p>5342 – 1735</p> 
Year 5	<p>5.3 Abstract column <a href="#">method with exchanging (including numbers with more than 4 digits)</a>.</p>	<p>See Year 4 if required.</p>	<p>See Year 4 if required.</p>	<p>5342 – 1735</p> 
	<p>5.4 Column method for <a href="#">decimals up to 2 decimal places with place value counters</a>.</p>	<p>3.24 – 1.16</p> 	<p>3.24 – 1.16</p> 	

Year6	6.3 <a href="#">Abstract column method with exchanging (including numbers with more than 4 digits).</a>	See Year 4 if required.	See Year 4 if required.	
	6.4 <a href="#">Column method for decimals up to 2 decimal places with place value counters</a>	See Year 5 if required.	See Year 5 if required.	See Year 5 if required.

## Conceptual variation; different ways to ask children to solve 391 - 186

### Visual representations:

Part-part-whole diagrams and bar models.



### Word problems:

Raj spent £391, Timmy spent £186.  
How much more did Raj spend?

Calculate the difference between 391 and 186.

### Different forms of equations:

391

-186

What is 186 less than 391?

Missing digit calculations

$$\begin{array}{r}
 39\boxed{\phantom{0}} \\
 - \boxed{\phantom{0}}\boxed{\phantom{0}}6 \\
 \hline
 \boxed{\phantom{0}}05
 \end{array}$$

$$\boxed{\phantom{000}} = 391 - 186$$

### Concrete representations:


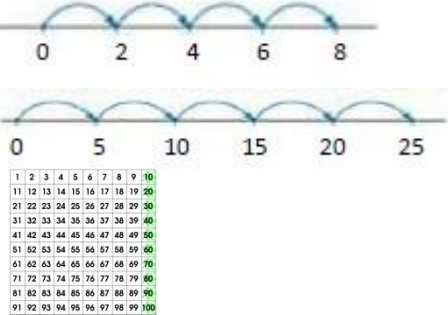

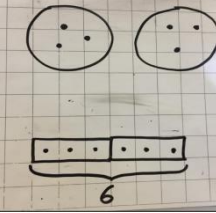
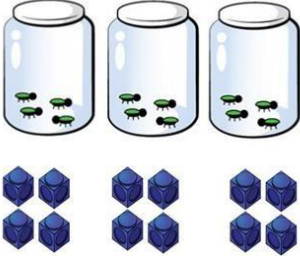
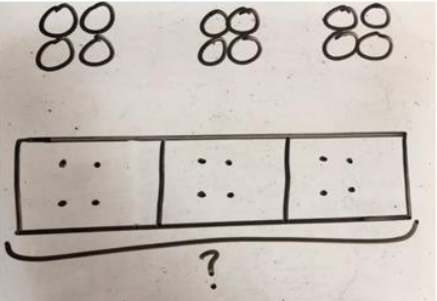


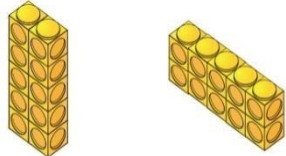

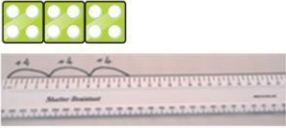
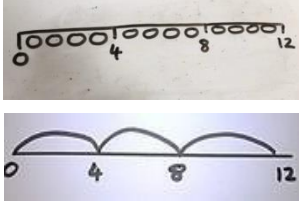
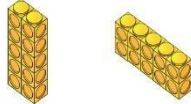
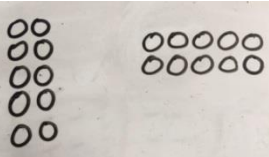
The difference between 11 and 14 is 3.

# Multiplication

Key language: double, times, multiplied by, the product of, groups of, lots of, equal groups, factors, multiples and exchange.

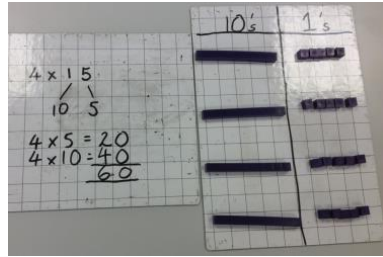
Year1/EYFS

Progression	Concrete	Pictorial	Abstract
<p><b>1.8 Counting in multiples</b> (skip count in 2's, 5's and 10's)</p>			<p>"5, 10, 15, 20, 25..."</p>
<p><u>1.9 Doubling</u></p>			<p><math>3 + 3 = 6</math></p>
<p><u>1.10 Repeated addition</u></p>	<p>Repeated addition  <math>3 \times 4</math>  <math>4 + 4 + 4</math>                      There are 3 equal groups, with 4 in each group.</p> 	<p>Children to represent the practical resources in a picture and use a bar model.</p> 	<p><math>3 \times 4 = 12</math></p> <p><math>4 + 4 + 4 = 12</math></p>

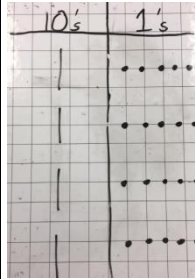
	<p><u>1.11 Arrays</u></p>	<p>Putting objects into arrays.</p>  <p>2 lots of 5      5 lots of 2      2</p> <p><math>2 \times 5 = 5 \times 2</math></p>	<p>Children describe arrays in different ways.</p> <p>2 groups of 5      5 groups of 2</p> 	<p>Children to be able to use an array to write a range of calculations e.g.</p> <p><math>5 \times 2 = 10</math></p> <p><math>2 \times 5 = 10</math></p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Year2</p>	<p><u>2.7 Number line to show repeated addition</u></p>	<p>Number lines to show repeated groups. E.g. <math>3 \times 4</math></p>  <p>Cuisenaire rods and Numicon can be used too.</p>	<p>Represent this pictorially alongside a number line</p> 	<p><math>4 + 4 + 4 = 12</math></p> <p><math>3 \times 4 = 12</math></p>
	<p><u>2.8 Arrays - showing commutative multiplication</u></p>	<p>Use arrays to illustrate commutativity counters and pegs can be used.</p> <p><math>2 \times 5 = 5 \times 2</math></p>  <p>2 lots of 5      5 lots of 2</p>	<p>Children to represent the arrays pictorially.</p> <p><math>2 \times 5</math>      <math>5 \times 2</math></p> 	<p>Children to be able to use an array to write a range of calculations e.g.</p> <p><math>10 = 2 \times 5</math></p> <p><math>5 \times 2 = 10</math></p> <p><math>2 + 2 + 2 + 2 + 2 = 10</math></p> <p><math>10 = 5 + 5</math></p>

**3.5 Multiplication by partitioning**  
2d x 1d using dienes

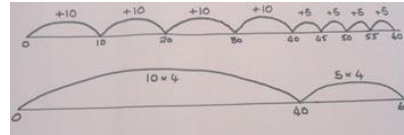
Partition to multiply using dienes of Numicon.



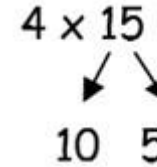
**4 X 15**



A number line should also be used



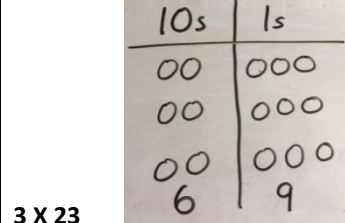
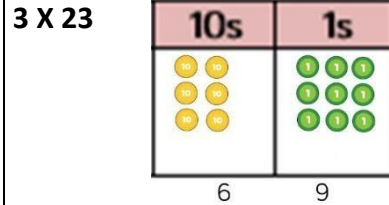
Children to be encouraged to show the steps they have taken.



$$\begin{array}{r} 4 \times 5 = 20 \\ 4 \times 10 = 40 \\ \hline 60 \end{array}$$

**3.6 Short multiplication**  
(2 digit X 1 digit)

Short multiplication method.  
 Use counters or dienes.

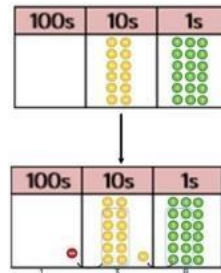


Children to be encouraged to show the steps they have taken.

$$\begin{array}{r} 3 \times 3 = 9 \\ 3 \times 20 = 60 \\ \hline 69 \end{array} \qquad \begin{array}{r} 23 \\ \times 3 \\ \hline 69 \end{array}$$

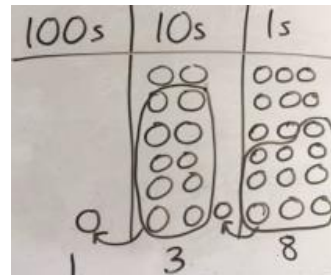
**3.7 Short multiplication**  
with exchanging (2 digit X 1 digit)

Formal column method with place value



counters.  
 6 x 23

**6 X 23**



Formal written method

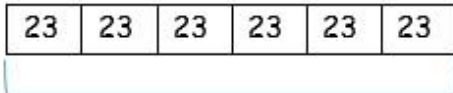
$$\begin{array}{r} 6 \times 23 = \\ 23 \\ \times 6 \\ \hline 138 \\ 11 \end{array}$$

Year4	<p><b>4.3 Short multiplication—</b>  <u>place value counters.</u>  <b>(2 and 3 digit X 1 digit)</b></p>	<p><b>225 X 3 = 675</b></p>	<p><b>225 X 3 = 675</b></p>																
	<p><b>4.4 Grid method to—</b>  <u>expanded method.</u>  <b>(for 2- digit X 2-digit)</b></p>	<p>Use abstract methods.</p>	<p>Use abstract methods.</p>	<p><b>56 x 27 = 1512</b></p> <table border="1"> <tr> <td>x</td> <td>20</td> <td>7</td> <td></td> </tr> <tr> <td>50</td> <td>1000</td> <td>350</td> <td>1350</td> </tr> <tr> <td>6</td> <td>120</td> <td>42</td> <td>162</td> </tr> <tr> <td></td> <td></td> <td></td> <td>1512</td> </tr> </table> <p style="text-align: right;">1</p> <p>First introduce children to the grid method.</p> <p>Then <u>progress</u> to the expanded method.</p>	x	20	7		50	1000	350	1350	6	120	42	162			
x	20	7																	
50	1000	350	1350																
6	120	42	162																
			1512																
Year5	<p><b>5.5 Short multiplication</b>  <u>Abstract only but might need a repeat of year 4 first (up to 4 digit X 1 digit)</u></p>	<p>See Year 4 if required</p>	<p>See Year 4 if required</p>																

	5.6 Long multiplication Abstract only but might need a repeat of year 4 first (up to 4 digit X 2 digits)	See year 4 if required.	See year 4 if required.	$\begin{array}{r} 132 \\ \times 56 \\ \hline 792 \\ 6600 \\ \hline 7392 \end{array}$ <p>(132 × 6) (132 × 50)</p>
Year6	6.5 Long multiplication Abstract method (up to 4 digits by a 2 digit number)	See year 4 if required.	See year 4 if required.	$\begin{array}{r} 132 \\ \times 56 \\ \hline 792 \\ 6600 \\ \hline 7392 \end{array}$ <p>(132 × 6) (132 × 50)</p>

## Conceptual variation; different ways to ask children to solve $6 \times 23$

Visual representations:



?

This image shows  $4 \times 6$



Change the image to show  $4 \times 7$

Word problems:

Mai had to swim 23 lengths, 6 times a week.  
How many lengths did she swim in one week?

Using place value counters, prove that  $6 \times 23 = 138$

Different forms of equation:

Find the product of 6 and 23

$$\square = 6 \times 23$$

$$\begin{array}{r} 6 \quad 23 \\ \times 23 \quad \times 6 \\ \hline \quad \quad \hline \end{array}$$

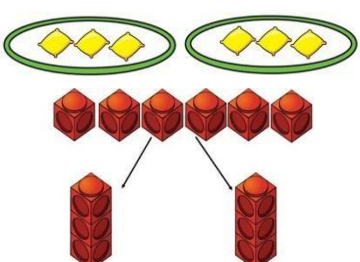
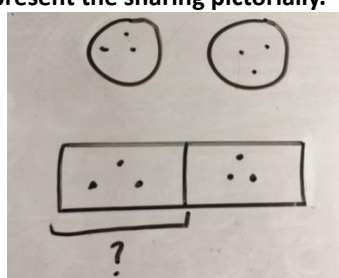
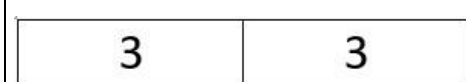
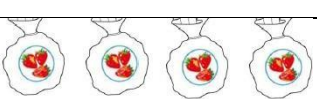

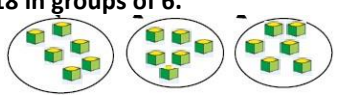
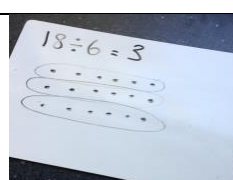
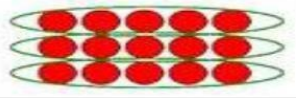
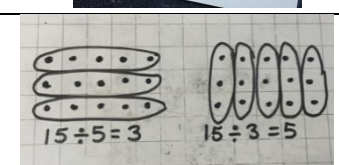
Concrete representations:

What is the calculation?  
What is the product?

100s	10s	1s

# Division

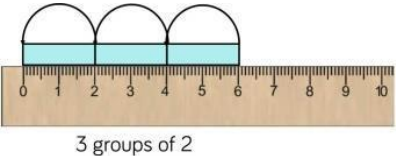
Key language: share, group, groups of, lots of, regroup, divide, divided by, remainder divisor, dividend.

	Progression	Concrete	Pictorial	Abstract
EYFS/Year1	<p><b>1.12</b> <a href="#">Division by sharing objects into groups.</a></p>	<p>Sharing using a range of objects. <math>6 \div 2</math></p> 	<p>Represent the sharing pictorially.</p> 	<p><math>6 \div 2 = 3</math></p> 
	<p><b>1.13</b> <a href="#">Division by making groups.</a></p>	 <p>I have 12 strawberries and put them in groups of 3, how many groups?</p>	<p>Pictures of objects</p> <p>Each pot needs three pencils in. How many pots do we need?</p> 	<p><math>12 \div 3 = 4</math></p>
Year2	<p><b>2.9</b> <a href="#">Division by making groups.</a></p>	<p>18 in groups of 6.</p> 		<p>There are 3 groups of 6 in 18. <math>18 \div 6 = 3</math></p>
	<p><b>2.10</b> <a href="#">Division within arrays- linking to multiplication. (Sharing and grouping)</a></p>	<p>15 shared between 3. 15 in groups of 5.</p> 		<p><math>15 \div 5 = 3</math> <math>15 \div 3 = 5</math></p>

**2.11 Division as counting up**

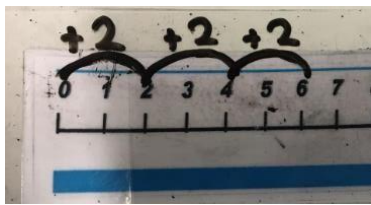
How many groups of 2 in 6? Use number line or Cuisenaire rods on a ruler.

$6 \div 2$



3 groups of 2

Children to represent division by counting up




$6 \div 2 = 3$

**3.8 To divide a two digit number by a one digit number with and without remainders.**

Cuisenaire rods, above a ruler can also be used.


$13 \div 4$

Use of lollipop sticks to form wholes-squares are made because we are dividing by 4.

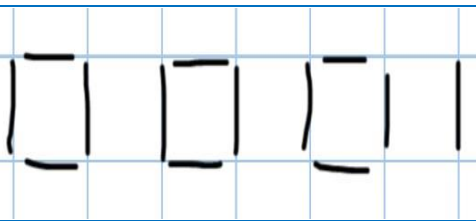


There are 3 whole squares, with 1 remainder.

Use of numicon. How many groups of 3 in 20?  $20 \div 3$



Children to represent the lollipop sticks pictorially.



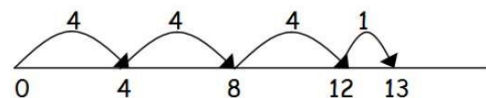
There are 3 whole squares, with 1 left over.

$13 \div 4 = 3 \text{ remainder } 1$

Children should be encouraged to use their times table facts; they could also represent repeated addition on a number line.

'3 groups of 4, with 1 left over'

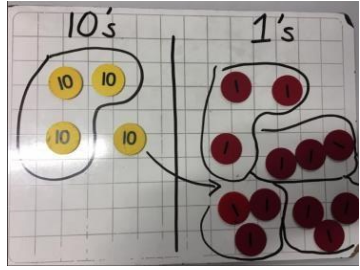
$13 \div 4 = 3 \text{ r } 1$



**3.9 Short Division**  
To divide a two digit number by a one digit number with exchanging of tens and ones (no remainders)

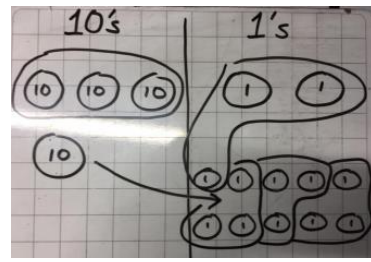
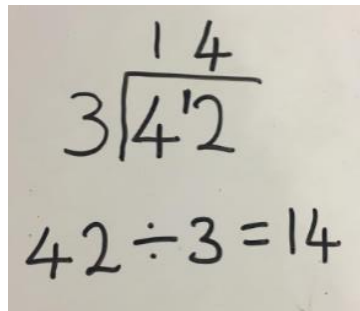
Short division using place value counters and dienes to group.

$42 \div 3 = 14$



Children to represent the place value counters/dienes pictorially.

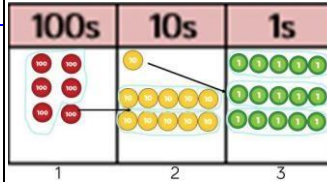
$42 \div 3 = 14$

Year4

4.5 Short division  
[To divide a 3 digit number by a 1 digit number with exchanging in hundreds, tens and ones](#)

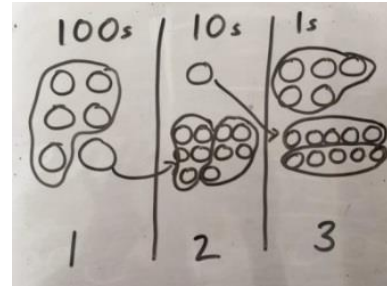
Short division using place value counters to group.  $615 \div 5$



How many groups of 5 hundreds can you make with 6 hundred counters?

1

Represent the place value counters pictorially.



Children progress to the calculat short division scaffold.

$$\begin{array}{r} 123 \\ 5 \overline{) 615} \end{array}$$

Year5

5.7 Short division  
[Dividing a 4 digit number by a 1 digit number including remainders](#)

See Year 4 if required.

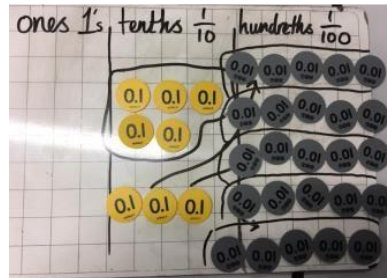
See Year 4 if required.

$$\begin{array}{r} 0658. \\ 4 \overline{) 22634} \end{array}$$

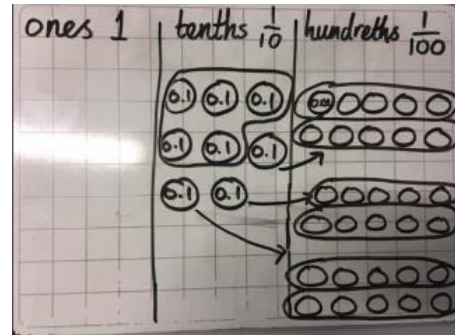
Remainder 2

5.8 Short division  
[Division problems with decimal numbers \(up to 2 d.p\)](#)

$0.8 \div 5$



$0.8 \div 5$

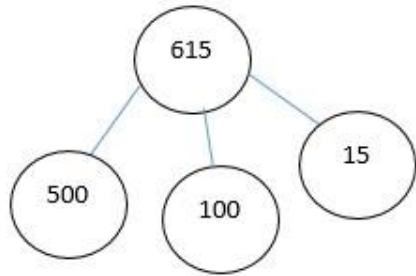


$$\begin{array}{r} 0.16 \\ 5 \overline{) 0.80} \end{array}$$

Yea r6	6.6 Short division	See Year 4 if required.	See Year 4 if required.	$\begin{array}{r} 0658. \\ 4 \overline{) 2^2 6^2 3^3 4} \end{array}$
	6.7 Long division/ chunking method (up to 4 digit by a 2 digit number)			$\begin{array}{r} 203 \\ 14 \overline{) 2842} \\ \underline{2800} - (200 \times 14) \\ 0042 \\ \underline{0042} - (3 \times 14) \\ 0000 \end{array}$ <div data-bbox="1793 565 1976 943" style="border: 1px solid black; padding: 5px; width: fit-content;"> <p><b>Help Box</b></p> <p>1x14 = 14</p> <p>2x14 = 28</p> <p>3x14 = 42</p> <p>4x14 = 56</p> <p>5x14 = 70</p> <p>6x14 = 84</p> <p>7x14 = 98</p> <p>8x14 = 112</p> <p>9x14 = 126</p> <p>10x14 = 140</p> </div>
<b>Conceptual variation; different ways to ask children to solve <math>615 \div 5</math></b>				

Visual representations:

Using the part whole model below, how can you divide 615 by 5 without using short division?



Word problems:

I have £615 and share it equally between 5 bank accounts. How much will be in each account?

615 pupils need to be put into 5 groups. How many will be in each group?

Different forms of equation:

$$5 \overline{)615}$$

$$615 \div 5 =$$

$$= 615 \div 5$$

Concrete representations:

What is the calculation?  
What is the answer?

100s	10s	1s