



Christ Church & St Peter's CE Primary School

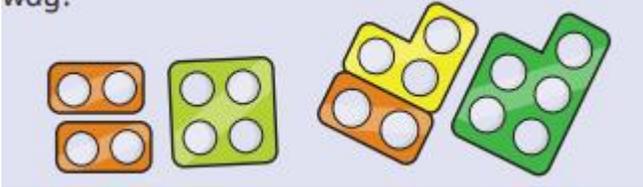
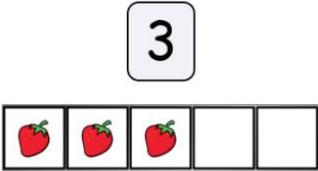
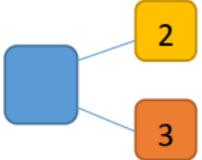
'Aiming High & Caring for Everyone'

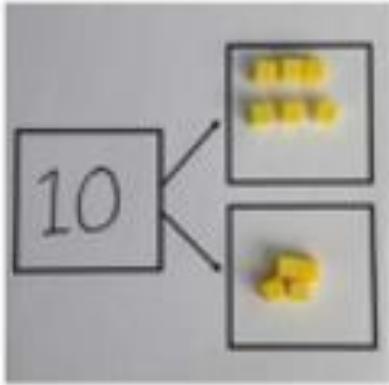
# Written Calculation Policy

Written – Autumn 2023

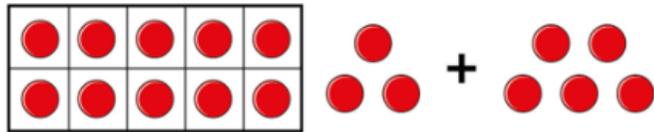
Review Date: October 2025

# Addition

	Concrete	Pictorial	Abstract
EYFS	<p>Combining two sets of small number e.g using numicon. To understand they combine to make a larger number way:</p>  <p>Count objects of a number up to 10 and later to 20</p> <p>Physically add one more and recount – 1 to 1 correspondence.</p> <p>By the end of EYFS children should be able to count,</p>	<p>Using pictorial representations in a tens frame. Count how many objects are shown</p>  <p>What is 1 more than 3?</p> 	
Year 1	<p><b><u>Addition by combining two groups</u></b>  <b>In Year 1 Children will use physical objects to combine two groups.</b></p>  <p>They count two separate sets of numbers. Combine them together and count by tapping or moving each object. Developing their one to one correspondence.</p> <p>The two groups can also be placed on a blank part whole model and then moved across to combine them. E.g</p>	<p><b><u>Addition by combining two groups</u></b>  <b>In year 1, children, when they are confident counting physical objects they can then use visual representations to show regrouping</b> – using a variety of pictures of objects and mathematical equipment such as cubes, counters, numicon and bead strings.</p>  <p>Use bar models and part whole models and tens frames to represent problem.</p>	<p><b><u>Addition by combining two groups</u></b>  <b>By the end of year 1, children will be able to calculate in the abstract.</b>          Using (partially completed or blank) part whole models and bar models,</p> <p> <math>2 + 3 = 5</math>  <math>3 + 2 = 5</math>  <math>5 = 3 + 2</math>  <math>5 = 2 + 3</math> </p> 



Or link the multi cubes together into a bar

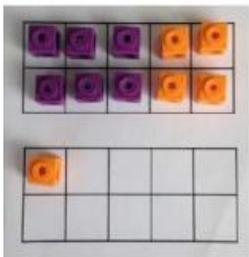


$$13 + 3 = \square$$

**Addition using number bonds**

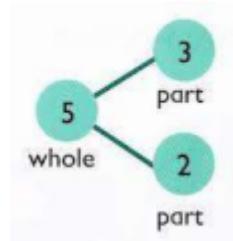
Children in year 1 develop understanding of number bonds.

Using tens frames children are able to make the ten, and seeing how many are in the next ten after regrouping  $9 + 3 =$



$$6 + 5 = 11$$

Start with the bigger number and use the smaller number to make 10.



e.g

Sam has 12 sweets.

Max gives her 3 more sweets.

How many sweets does Sam have now?



**Addition using number bonds**

Children in year 1 use pictorial representation to demonstrate the grouping to ten using number bonds knowledge.

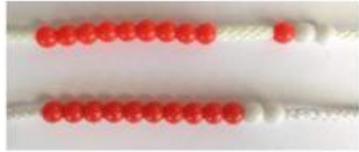
**Addition using number bonds**

Children, will be able to calculate mentally or using informal jottings by the end of Year 1 using their knowledge of number bonds. E.g

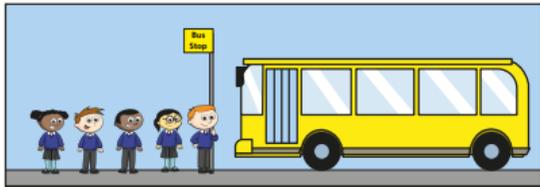
$$6 + 5 = 11$$

Knowing  $6 + 4 = 10$  and then add one more.

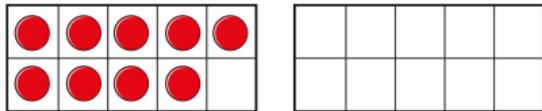
$9 + 3 = 10$  and 2 more.



First, there are 9 children on the bus.  
Then, 5 more children get on the bus.



How many children are on the bus now?  
Complete the ten frames and the sentences.



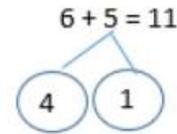
$$\square + \square = \square$$

**Addition by counting forward**

In year 1, children are taught the skill of counting forward from the largest number for an efficient way of adding.



Start with the larger number on the bead string and then count on to the smaller number 1 by 1 to find the answer.



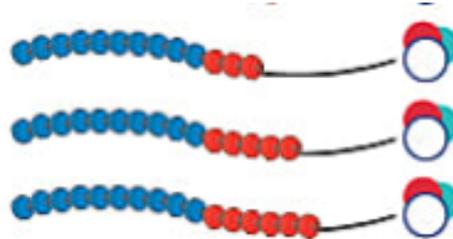
$6 + 4 = 10$

$10 + 1 = 11$

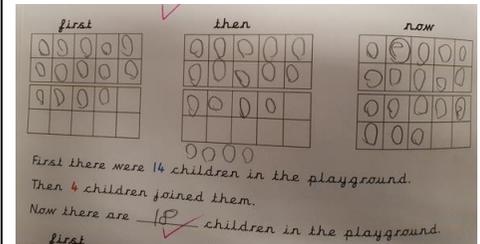
Using Pictorial representations of tens frames, children use them to identify first, then now – after combining two amounts.

**Addition by counting forward**

Having pictorial representations of bead strings for children to count forward from.



Using empty tens frames children solve addition problems using first, then and now.



**Addition by counting forward**

By the end of year 1, children should be able to annotate blank number lines or calculate mentally by putting largest number first and counting forward





$16 + 4 = 20$   
 $4 + 16 = 20$   
 $20 - 4 = 16$

**Addition method without regrouping**

In year 2 – children are introduced to the first step of a written addition method without regrouping using base ten first before using place value counters children physical represent number on a place value grid of tens and ones Children always begin with adding the ones column first followed by the tens. How many ones? How many tens?

8a. Write four sentences to describe the fact family shown in the part whole model.

$7 + 6 = 13$   
 $6 + 7 = 13$   
 $13 = 7 + 6$

**Addition method without regrouping**

Children can then move into using pictorial representations and draw their own counters or base ten to help them solve additions

Tens	Ones

$41 + 23 = 64$

Tens	Ones
6	4

= 64

$47 + 4 = 51$  ✓

$65 + 9 = 74$  ✓ wow! 😊

**Addition method without regrouping**

When children are secure in the method with pictorial representations children will be able to draw their own methods onto empty place value charts

$24 + 15 = 39$

$24$   
 $+ 15$   


---

 $39$

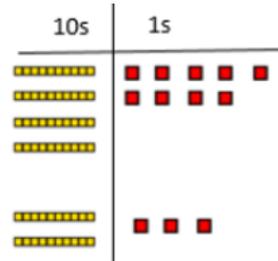
$71 + 24 = 95$

Tens	Ones
4	5

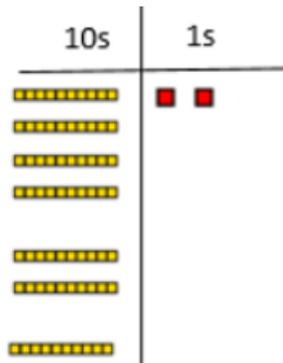
= 95

**Addition method with regrouping**

In year 2, children extend their knowledge the addition method where numbers require regrouping  
Physically using base ten and place value coins, children make given numbers on empty place value charts.



Children regroup the ones into another ten – leaving extra ones.



Begin with ones column

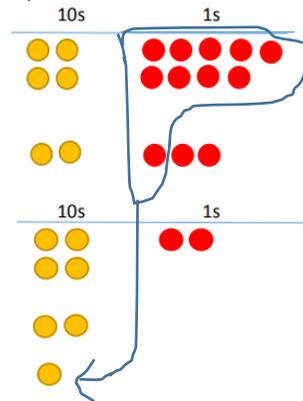
How many ones? 2

How many groups of 10? 7 groups of 10 = 70

$70 + 2 = 72$

**Addition method with regrouping**

Using pictorial representations of base ten and place value coins or children can draw their own representations



How many ones? 2

How many tens? 7 = 70

$70 + 2 = 72$

**Addition method with regrouping**

**By the end of year 2**, children will be able to use a written method for adding two, two-digit numbers which do not cross the hundred boundary.

$$40 + 9$$

$$\underline{20 + 3}$$

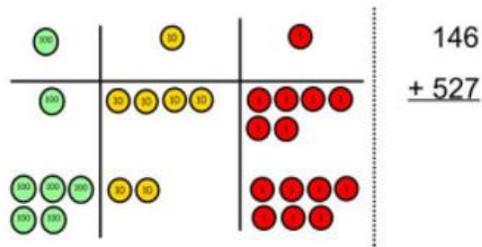
$$\begin{array}{r} 1 \quad 1 \\ 6 \quad 0 \\ \hline 7 \quad 1 \end{array}$$

this may be set out using a frame

**Addition written method without exchanging**

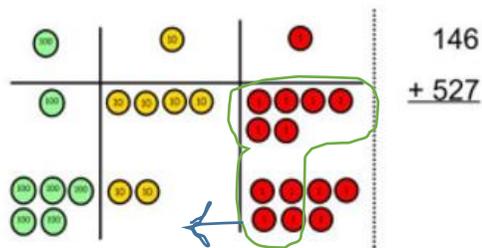
In year 3, children continue to develop their ability of using a written method but extending to 3-digit numbers.

Make both number using place value coins and base 10 – show the written calculation alongside.



**Addition method with exchanging**

Regroup any columns which have more than 9



Add the ones columns first, then tens and hundreds. Writing out the totals vertically

**Addition written method without exchanging – Children in year 3 will then begin to formally write their method**

using given pictorial representations

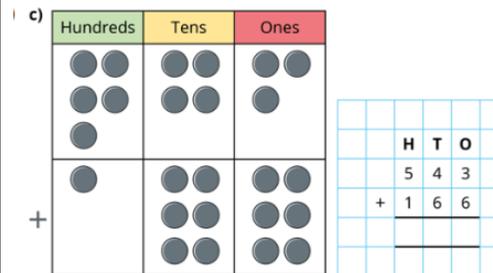


or drawing own representations



**Addition method with exchanging**

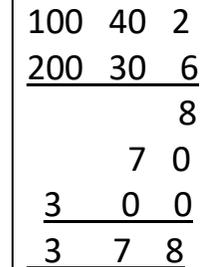
Using pictorial representation or given blank place value chart to represent their numbers themselves



**Addition written method without exchanging –**

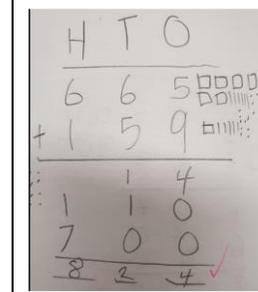
By the end of year 3, children are confident in using a method to add two three-digit numbers.

Without exchanging



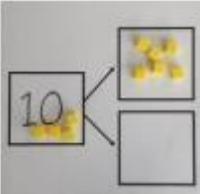
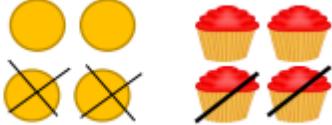
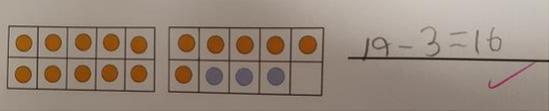
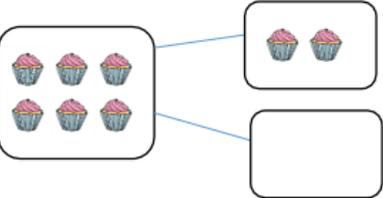
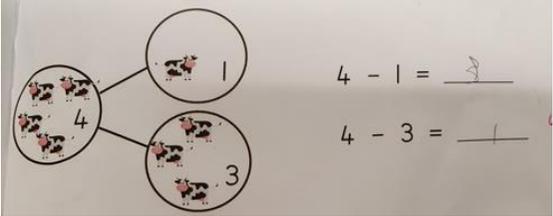
**Addition method with exchanging**

By the end of year 3, children are able to use an expanded written method of addition to add two three-digit numbers





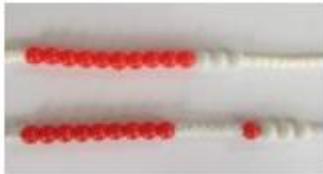
# Subtraction

EYFS			
Year 1	<p><b><u>Subtraction by taking away ones</u></b> Use physical objects, counters, cubes etc. to demonstrate how objects are being taken away by moving them away from the group.</p>  <p><b><u>Subtraction using Part Whole model</u></b> Link to addition- use the part whole model to help explain the inverse between addition and subtraction.</p>  <p>If 10 is the whole and 6 is one of the parts. What is the other part? Extend to further number facts</p> <p> <math>4 = 10 - 6</math>  <math>6 = 10 - 4</math>  <math>10 - 6 = 4</math>  <math>10 - 4 = 6</math> </p>	<p><b><u>Subtraction by taking away ones</u></b> Cross out pictures of objects to show what has been taken away</p> <p><math>4 - 2 = 2</math></p>   <p><b><u>Subtraction using Part Whole model</u></b> Using a pictorial representation of objects, counters, cubes etc to show part whole model for subtraction. <math>6 - 2 =</math></p>  <p>And writing other known facts.</p> <p> <math>6 - 2 = 4</math>  <math>6 - 4 = 2</math>  <math>2 = 6 - 4</math>  <math>4 = 6 - 2</math> </p>	<p><b><u>Subtraction by taking away ones</u></b> <math>18 - 3 = 15</math> <math>8 - 2 = 6</math> Although number sentences are recorded in the concrete and pictorial methods, children are introduced to them on their own while encouraging them to mentally take away ones or making jottings.</p> <p><b><u>Subtraction using Part Whole model</u></b> Using blank or partially filled part whole models to complete problems containing numbers.</p>   <p><b><u>Subtraction by counting back</u></b></p>

**Subtraction by counting back**

Children use bead strings to count backwards. Children make the larger number in your subtraction. Move the beads along your bead string as you count backwards in ones

$13 - 4 =$

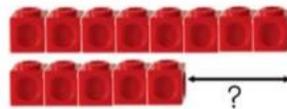


**Subtraction by finding the difference**

Compare amounts and objects to find the difference. Use cubes to build towers or make bars to find the difference. Use basic bar models with items to find the difference.

Physically snapping off the extra will support the children to understand how many more one group

Calculate the difference between 8 and 5.

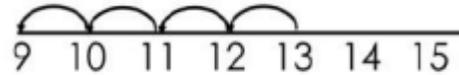


has over another.

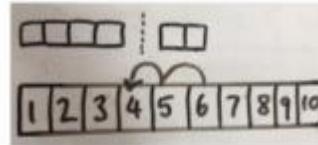
**Subtraction by counting back**

Count back on a number line or number track Start at the bigger number and count back the smaller number, showing the jumps on the number line.

$13 - 4 =$



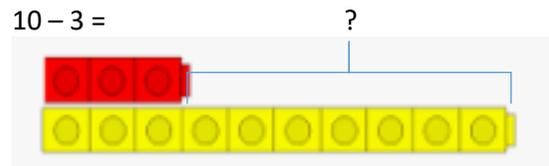
$6 - 2 =$



**Subtraction by finding the difference**

Using pictorial representations of the cubes they have physically used before where each object is able to be counted.

$10 - 3 =$



Before using other pictorial representations.



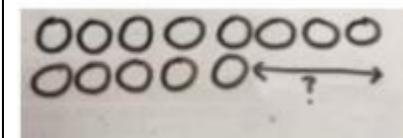
Extending to bar model versions

Put 13 in your head, count back 4. What number are you at? Children use fingers to help if needed.

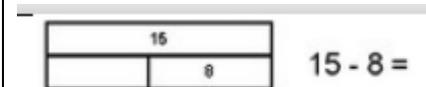
**Subtraction by finding the difference**

Children are given the problem and asked to draw the bars independently e.g.

Hannah has 8 goldfish. Helen has 5 goldfish. Find the difference between the number of goldfish the girls have.

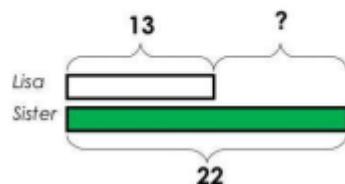


Or



Bar modelling for subtraction.

Lisa is 13 years old. Her sister is 22 years old.  
Find the difference in age between them.



Year 2

**Subtraction by taking away ones**

Using rekenrek or bead strings to take ones away. ( as year 1 with larger numbers)

**Part Whole models** ( as year 1 with larger numbers)

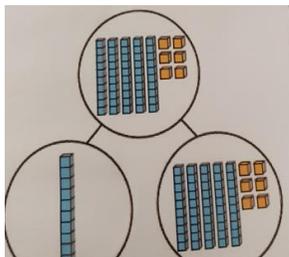
**Counting Back** ( as year 1 but with larger numbers)

**Finding the difference** ( as year 1 but with larger numbers) – snapping off the cubes to see the difference

**Subtraction by taking away ones**

Using visual representations of number lines to take ones away. ( as year 1 with larger numbers)

**Part Whole models**( as year 1 with larger numbers)  $56 - 10 =$



**Counting Back** ( as year 1 but with larger numbers)

**Finding the difference** ( as year 1 but with larger numbers)

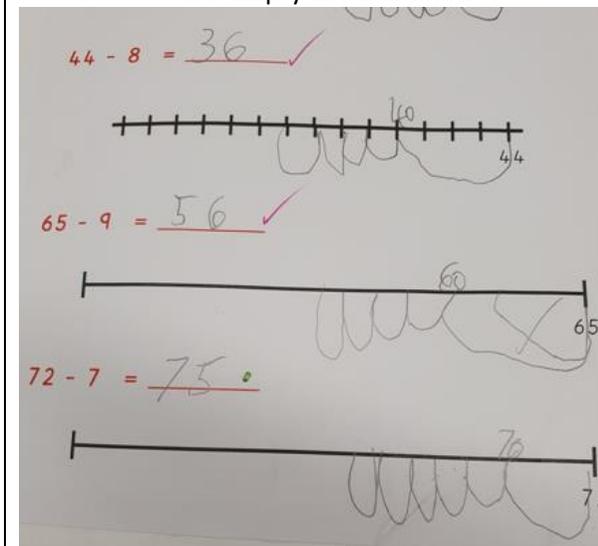
**Subtraction by taking away ones**

Children draw their own number line to cross out or calculate mentally taking away ones

**Part Whole models** – children will draw their own part whole

**Counting Back by drawing number lines**

Children use number lines that have intervals demarked or use empty number lines.

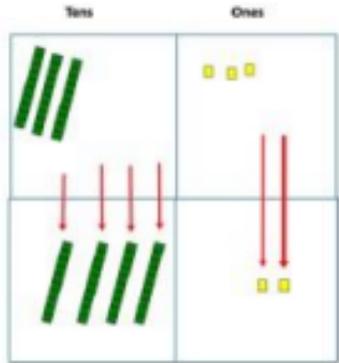


**Finding the difference**

**Subtraction written method without exchanging**

Use objects such as base 10 rods or bundles of straws to show partitioning of tens and ones to subtract a 2 digit number from another 2 digit number with no regrouping involved.

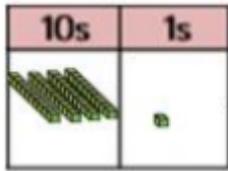
Use Base 10 to make the bigger number then take the smaller number away



Begin with subtracting the ones first before moving to tens column

**Written method with exchanges**

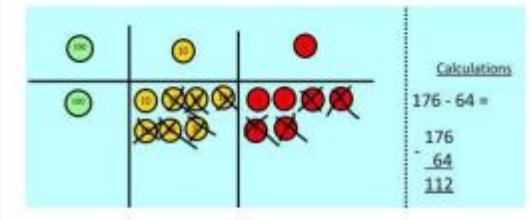
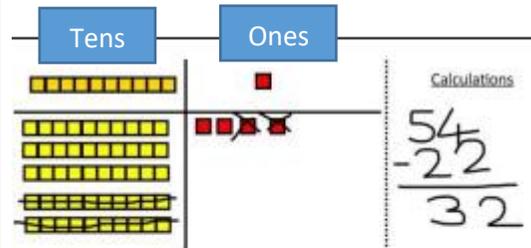
Using base ten children make the number they are subtracting from using partitioning. e.g 41 - 26



Step 2: physically exchange a ten into ten ones.

**Subtraction written method without exchanging**

Using pictorial representations of base 10 to cross out the number they are subtracting

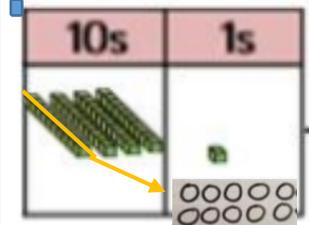


Begin with subtracting the ones first before moving to tens column.

**Written method with exchanges**

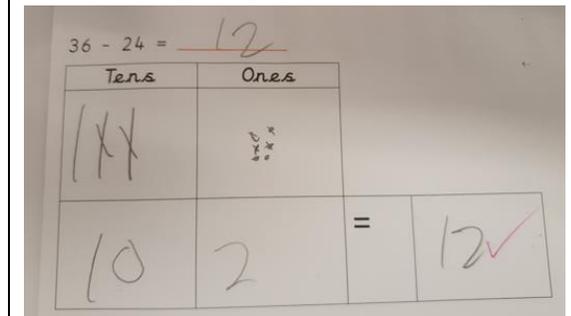
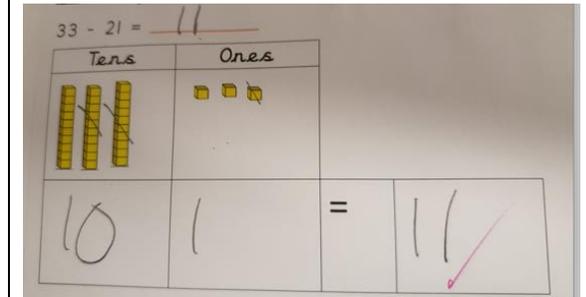
Using a visual representation of the base ten method. Children are given initial number. They are then encouraged to exchange and draw the ten represented in the ones column.

e.g. 41 - 26



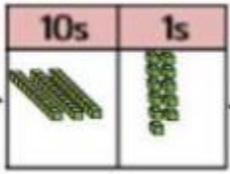
**Subtraction written method without exchanging**

Children encouraged to draw their own tens and ones. Beginning with the ones column first before subtracting the tens column.

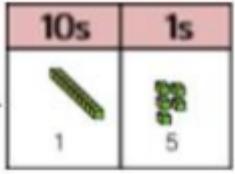


**Written method with exchanges**

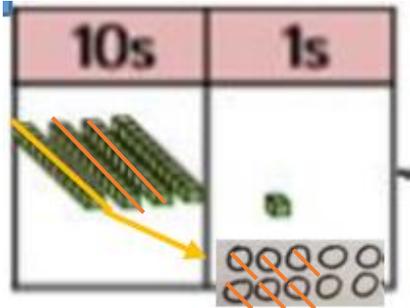
Children draw their own representations of base 10 to show method. Crossing out the tens to exchange and drawing the additional ones. 41 - 26



**Step 3: physically take away the number they are subtracting starting with the ones column.**

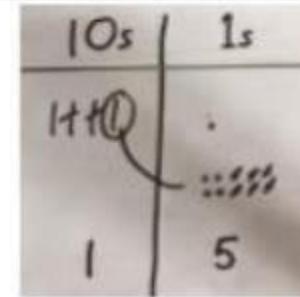


Then they are able to subtract by crossing out.



Total what is left

$$10 + 5 = 15$$



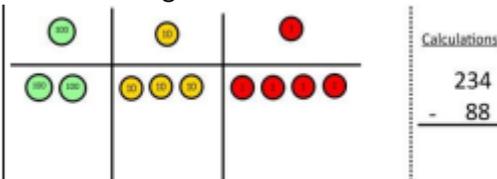
Year 3

**Subtractions written Method 2 and 3 digit numbers.**

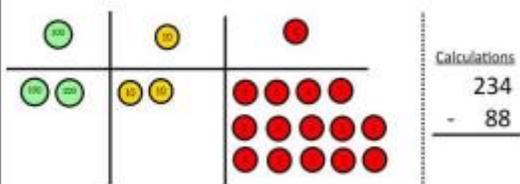
Column method using place value counters. 234-88

Use Base 10 to start with before moving on to place value counters.

Make the larger number with the place value counters alongside calculation



Start with the ones, can I take away 8 from 4 easily? I need to exchange one of my tens for ten ones



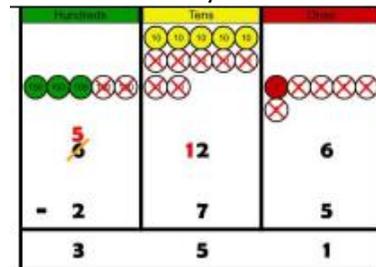
Now I can subtract my ones.

**Subtraction written Method 2 and 3 digit numbers**

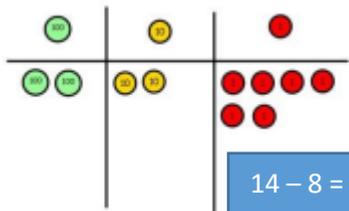
Using visual representations of partitioning.

**Written method 2 and 3 digit numbers**

Children writing out expanded method Draw the counters onto a place value grid and show what you have taken away by crossing the counters out as well as clearly showing the exchanges you make individually.



When confident, children can find their own way to record the exchange/regrouping. Just writing the numbers as shown here shows that the child understands the method and knows when to exchange/regroup

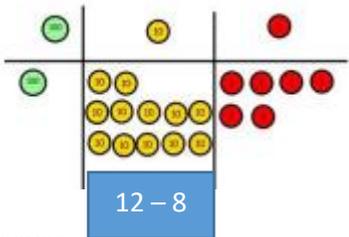


Calculations  

$$\begin{array}{r} 234 \\ - 88 \\ \hline \end{array}$$

$14 - 8 = 6$

Now look at the tens, can I take away 8 tens easily? I need to exchange one hundred for ten tens.

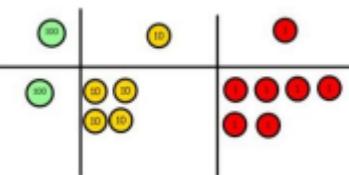


Calculations  

$$\begin{array}{r} 234 \\ - 88 \\ \hline \end{array}$$

$12 - 8$

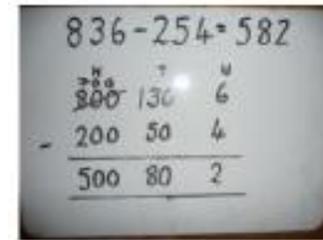
Leaves



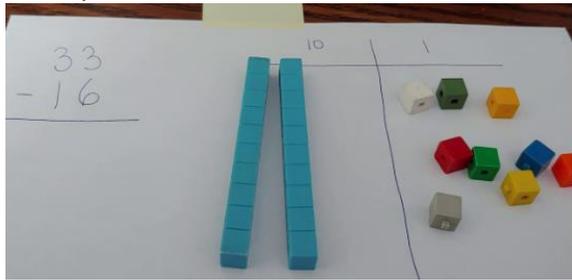
Calculations  

$$\begin{array}{r} 234 \\ - 88 \\ \hline 146 \end{array}$$

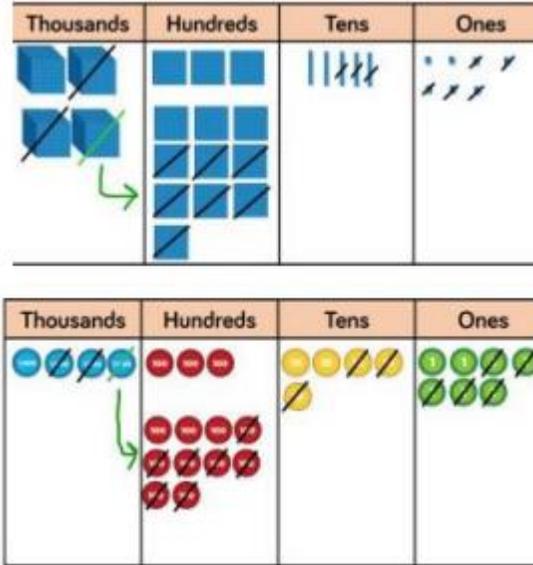
Show concrete alongside written calculation



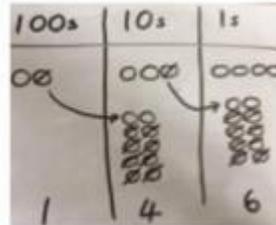
Year 4 **Formal Written method of Subtraction**  
 Year 5 Using base 10 and place value counters to  
 Year 6 demonstrate exchanging in whole numbers  
 initially.



**Formal Written method of Subtraction**  
 Using pictorial representations for children to mark to  
 show exchanges



Children drawing own representations



**Formal Written method of Subtraction**  
 Formal Method for Subtraction Formal column  
 method. Children must understand what has  
 happened when they have crossed out digits

$$\begin{array}{r} 3 \quad 1 \\ 4357 \\ - 2735 \\ \hline 1622 \end{array}$$

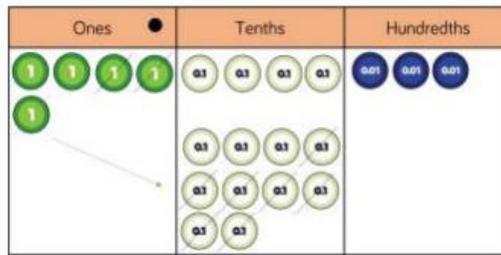
Formal column method (extend  
 understanding  
 of 0s for place  
 holders)

$$\begin{array}{r} \cancel{2} \quad \cancel{1} \quad 0 \quad \cancel{2} \quad 6 \\ - \quad 2 \quad 1 \quad 2 \quad 8 \\ \hline 2 \quad 8 \quad 9 \quad 2 \quad 8 \end{array}$$

Formal column method, aligning  
 decimal point accurately

$$\begin{array}{r} 4 \quad 1 \\ 5.43 \\ - 2.7 \\ \hline 2.73 \end{array}$$

Extending to larger numbers and decimals with  
 different PV places



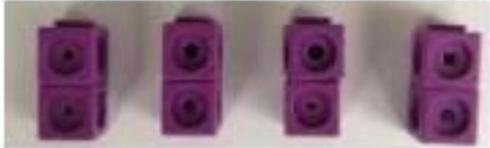
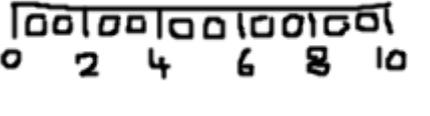
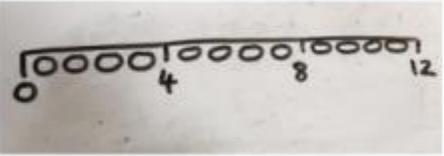
$$\begin{array}{r} \cancel{1} \cancel{2} \cancel{3} \cancel{0}, 699 \\ - \quad 89,949 \\ \hline 60,750 \end{array}$$

$$\begin{array}{r} \cancel{1} \cancel{2} 5 \cdot \cancel{4} 19 \text{ kg} \\ - \quad 36 \cdot 080 \text{ kg} \\ \hline 69 \cdot 339 \text{ kg} \end{array}$$

$$5) 1238.12 - 785.2 = 452.92$$

$$\begin{array}{r} \phantom{0} 11 \\ \cancel{1} \cancel{2} 3 \cancel{8} \cdot 12 \quad \checkmark \\ - 0785 \cdot 20 \\ \hline 0452 \cdot 92 \end{array}$$

# Multiplication

EYFS			
Year 1	<p><b><u>Multiplying by counting groups</u></b>          Using objects to help them count in groups of a number.          To see the link between multiplication and repeated addition.</p>  	<p><b><u>Multiplying by counting groups</u></b>          Using pictorial representations to enable children to count in multiples.</p>     	<p><b><u>Multiplying by counting groups</u></b></p> <p><math>2 \times 5 = 10</math>  <math>2 + 2 + 2 + 2 + 2 = 10</math>          2 multiplied by 5 = 2 pairs 5          Or 5 jumps of 2          Abstract number line showing 5 jumps of 2</p> <p><math>2 \times 5 = 10</math>  <math>5 \times 2 = 10</math>  <math>10 = 2 \times 5</math>  <math>10 = 5 \times 2</math>  <math>2 + 2 + 2 + 2 + 2 = 10</math>  <math>5 + 5 = 10</math></p>

**Multiplying by using arrays**

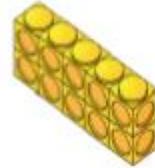
Arranging objects in to group and then arrange them into arrays

**Multiplying by using arrays**

$$2 \times 5 = 5 \times 2$$



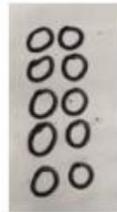
2 lots of 5



5 lots of 2

Extending to children drawing their own arrays.

Children to represent the arrays pictorially



$$2 \times 5 = 10$$

$$5 \times 2 = 10$$

$$5 \times 2 = 10$$



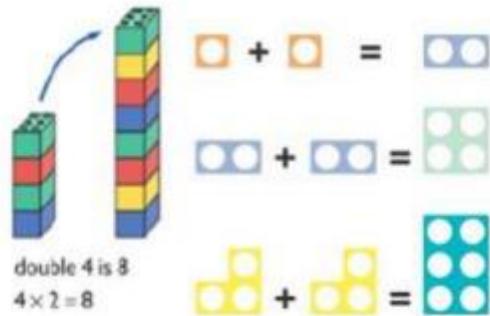
$$2 \times 5 = 10$$

Linking problem into a bar model

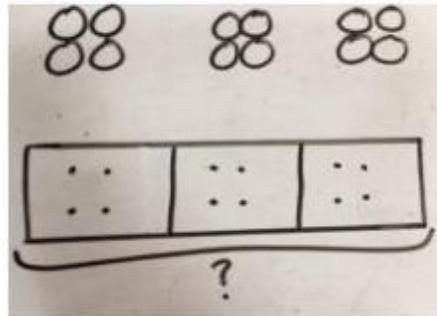
**Multiplying by using arrays**

**Multiplication by doubling**

Using numicon and cubes to see the relationship in doubles

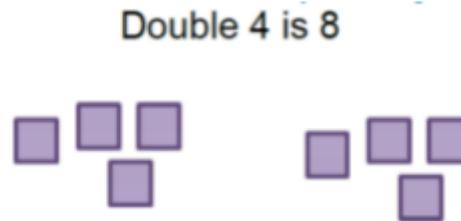


Represent practical resources in a picture and use a bar model



**Multiplication by doubling**

Using pictorial representations to aid calculations – leading to children drawing own representations



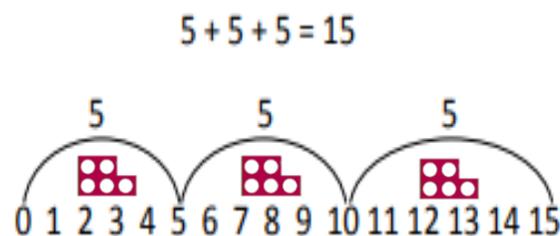
**Multiplication by doubling**

Double 4 = 8

Year 2

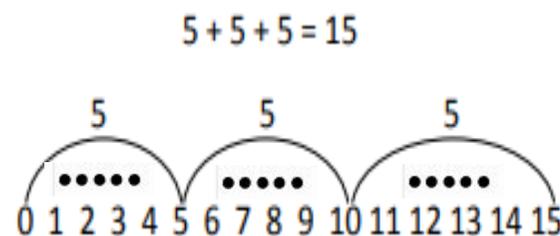
**Multiplying by Counting in groups**

On a number line



**Multiplying by Counting in groups**

On a number line

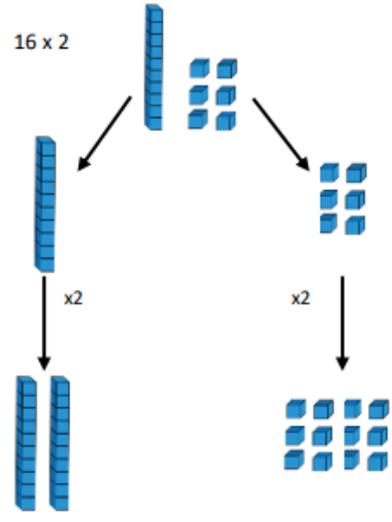


**Multiplying by Counting in groups**

Children drawing own jumps on a number line with given number track in intervals.

### Multiplying by doubling

**Doubling** - begin to develop an understanding doubling of 2 digit numbers up to 50



### Multiplying using arrays

#### Using arrays

to demonstrate communicate law of multiplications

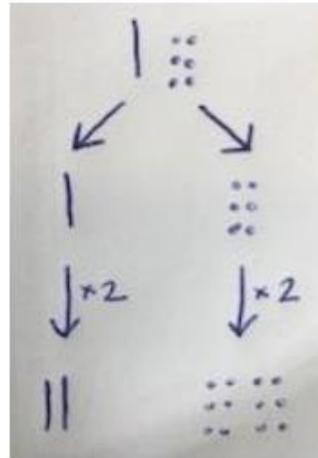
$$4 \times 6 = 24$$



for example,  $5 \times 3 = 15$  and  $3 \times 5 = 15$

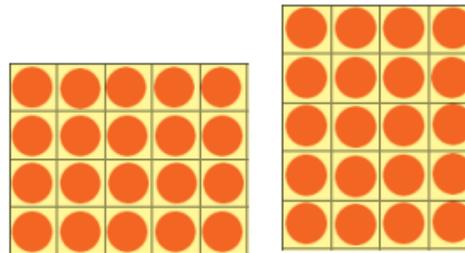
### Multiplying by doubling

Children **may** start to represent the materials pictorially



### Multiplying using arrays

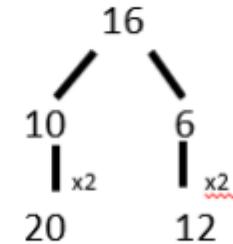
Using Arrays in different rotations



for example,  $5 \times 3 = 15$  and  $3 \times 5 = 15$

### Multiplying by doubling

Begin to use jottings **towards** recording the written method



### Multiplying using arrays

Use an array to write multiplication sentences and reinforce repeated addition.

$$5 + 5 + 5 = 15$$

$$3 + 3 + 3 + 3 + 3 = 15$$

$$5 \times 3 = 15$$

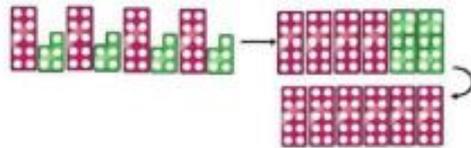
$$3 \times 5 = 15$$

**To multiply using partitioning**

Using base ten or place value counters to represent numbers in a grid  
Partition numbers first.

**Partition to multiply** using Numicon, base 10 or Cuisenaire rods

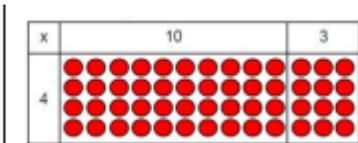
4 x 15



Formal Method

Begin with place value coins

4 x 13

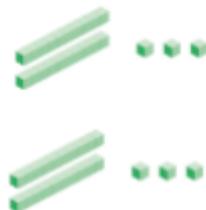


4 rows of 10  
4 rows of 3

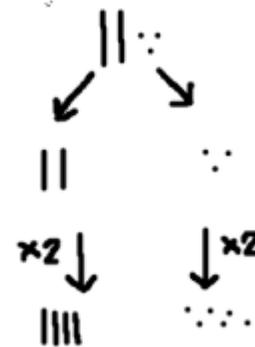
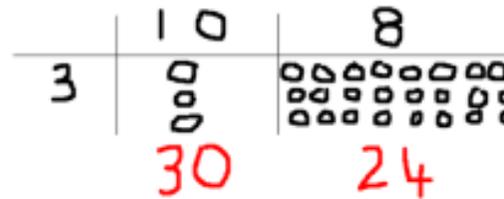
Extend to base ten

**Being to use expanded column method (long multiplication)** using place value counters or base 10

23x2

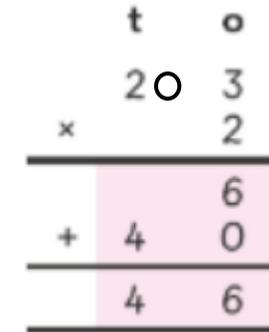


**To multiply using partitioning**



**To multiply using partitioning**

Use a partitioned expanded method.

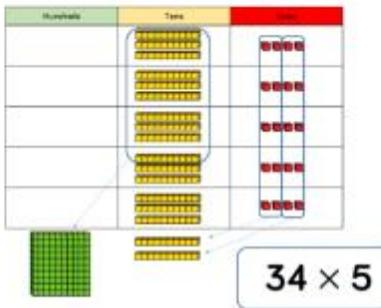
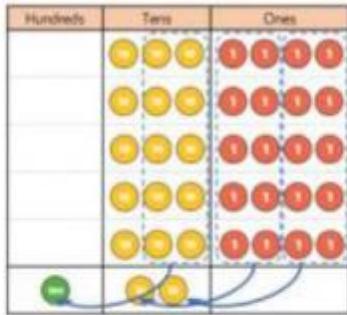


Year 4  
Year 5  
Year 6

**Formal Method for Multiplication**

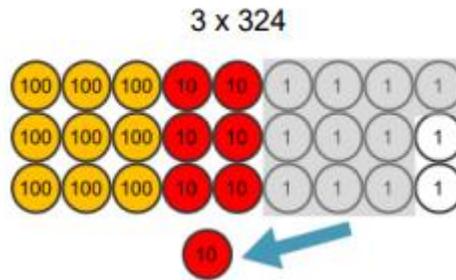
In Year 4 children are introduced to the formal method for multiplication. Using black templates, children physically use place value coins or base 10 to manipulate

Children use place value counters and Base 10 to multiply practically

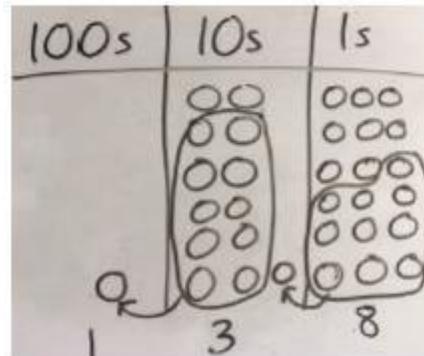


**Formal Method for Multiplication**

Using Pictorial representations of the formal method.



Children can draw their own representations



**Formal Method for Multiplication**

Children use an expanded method at the start of year 4 – and when secure in understand begin the more compact method

For 38 x 7

$$\begin{array}{r} 38 \\ \times 7 \\ \hline 56 \quad 8 \times 7 \\ 210 \quad 30 \times 7 \\ \hline 266 \end{array}$$

Extend to a more compact method.

For 38 x 7

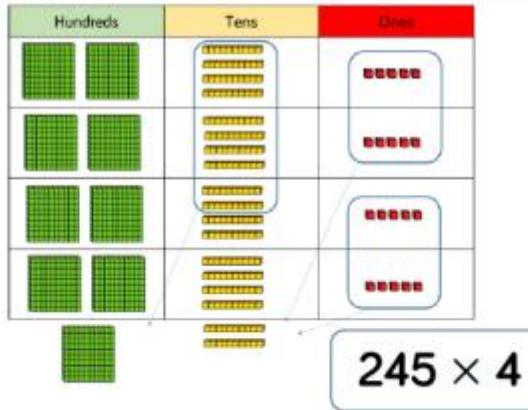
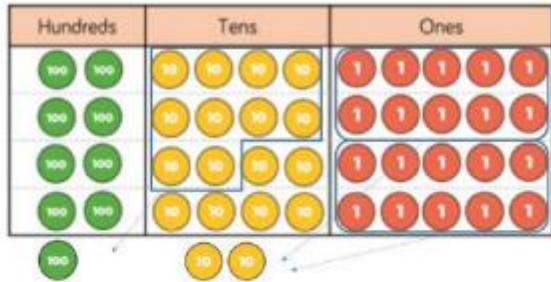
$$\begin{array}{r} 38 \\ \times 7 \\ \hline 266 \\ 5 \end{array}$$

**Long Multiplication**

For Long Multiplication – begin with expanded and extend to compact.

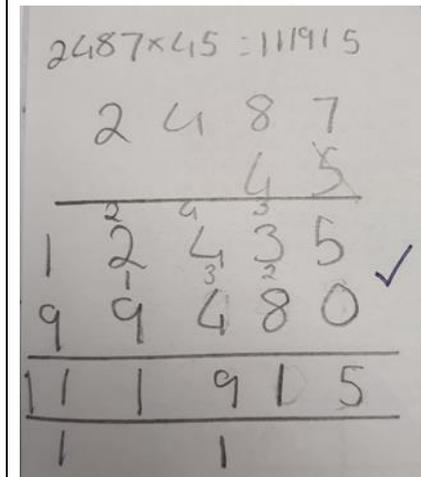
For 56 x 27

$$\begin{array}{r} 56 \\ \times 27 \\ \hline 392 \quad 56 \times 7 \\ 1120 \quad 56 \times 20 \\ \hline 1512 \\ 1 \end{array}$$



multiplying the ones first

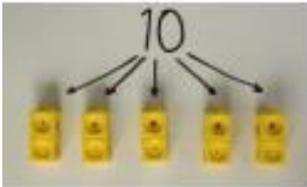
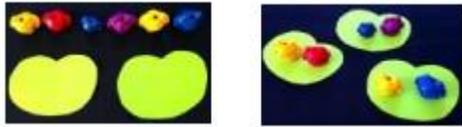
TTh	Th	H	T	O
	2	7	3	9
x			2	8
2	1	9	1	2
2	5	3	7	
1	5	4	7	8
1	7	6	6	9
	7	6	6	9
			2	2

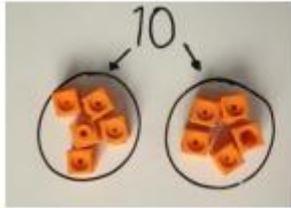


**Year 6 – use compact method to multiply decimals.**

	3	.	1	9
x	8			
	2	5	.	5
		1		7

# Division

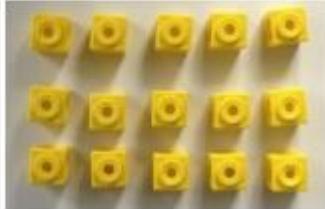
	Concrete	Pictorial	Abstract
EYFS			
Year 1	<p><b>Dividing by grouping</b> Using objects, physically sharing them into equal groups Use cubes, counters, objects or place value counters to aid understanding.</p>    <p>using numicon to see how many groups of 2 make 6 – leading to understanding of arrays</p> <p><b>Division by sharing</b> Using cubes, coins, counters etc to share the amount equally.</p>	<p><b>Dividing by grouping</b> Children to draw grouping and sharing small quantities.</p> <p><math>15 \div 5 = 3</math> Sharing</p> <p>Grouping</p>   <p><b>Division by sharing</b> Children use pictures or shapes to share quantities.</p>  <p><math>8 \div 2 = 4</math></p>	<p><b>Dividing by grouping</b> Children should also be encouraged to use their 2 times table facts.</p> <p><math>6 \div 2 = 3</math></p>  <p>There are 3 groups of 2 in 6</p> <p>Count in multiples of twos, fives and tens to identify how many groups.</p> <p><b>Division by sharing</b> Using knowledge of times tables.</p>



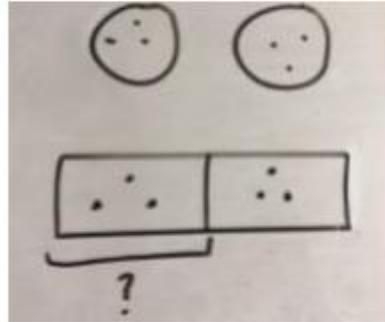
I have 10 cubes, can you share them equally in 2 groups?

**Division using arrays**

Children array cubes, counts into rows to create arrays

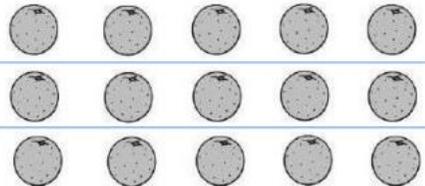


Represent the sharing pictorially.



**Division by using arrays**

Using pictures of arrays /numicon for children to identify groups.



**Division using Number lines**

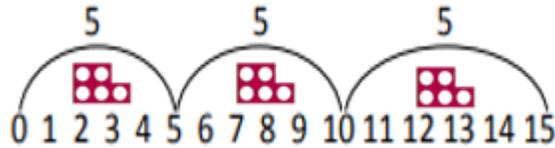
Using a number line to jump



$$6 \div 2 = 3$$

I can get 3 groups of 2 from 6

$$15 \div 5 = 3$$

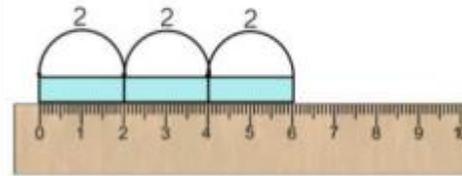


**Division using Number lines**

**Using pictorial representations, children use number lines to divide**

Count how many groups go in to the dividend.

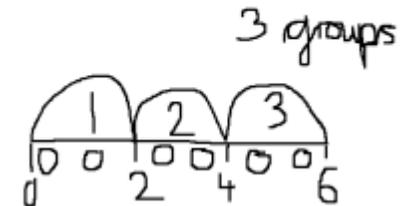
$$6 \div 2$$



3 groups of 2

**Division using Number lines**

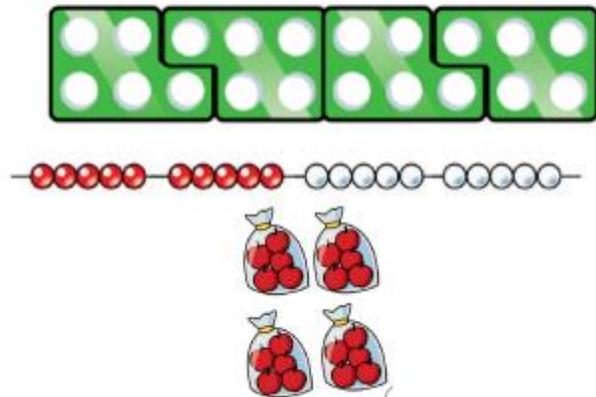
Children to represent counting how many groups go in to the dividend



Year 2

**Division by grouping**

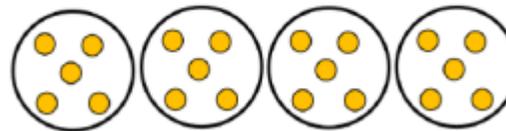
Use cubes and other practical manipulatives to group objects



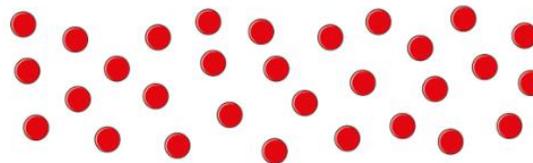
**Division by grouping**

Children use pictorial representations of groupings or to group numbers themselves

**Draw pictures to show groupings**



Here are some counters.



a) Draw circles around groups of 5

**Division by grouping**

Use knowledge of times tables  
 $20 \div 5 = 4$  (children are introduced to the division symbol in Year 2)

### Using Bar models to divide

Use of cubes to illustrate the whole- and parts of division.



### Division using arrays

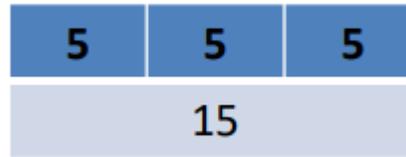
Children link division to multiplication by making arrays practically and creating number sentences

$$\begin{aligned} 15 \div 5 &= 3 \\ 15 \div 3 &= 5 \\ 3 \times 5 &= 15 \\ 5 \times 3 &= 15 \end{aligned}$$



### Using Bar models to divide

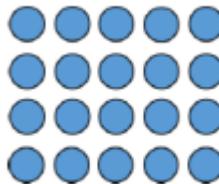
Representing grouping on bar models



$$\begin{aligned} 10 \div 5 &= ? \\ 5 \times ? &= 10 \end{aligned}$$

### Division using arrays

Children use pictorial representations of arrays to help them solve division problems and write 4 number facts from it..



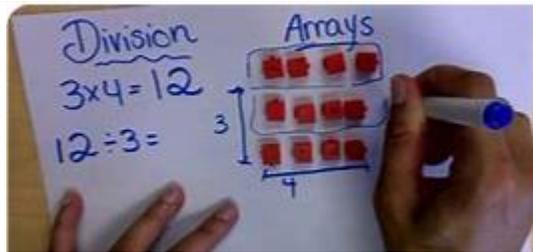
$$\begin{aligned} 4 \times 5 &= 20 \\ 5 \times 4 &= 20 \\ 20 \div 5 &= 4 \\ 20 \div 4 &= 5 \end{aligned}$$

### Using Bar models to divide

Children draw their own bar models to help them calculate division problems

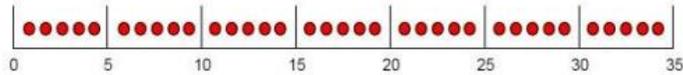
### Division using arrays

Children drawing own arrays to solve problems.



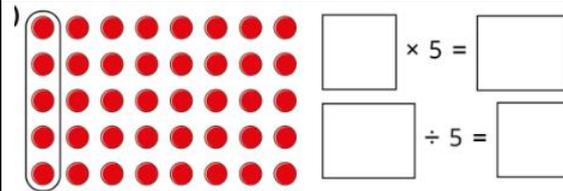
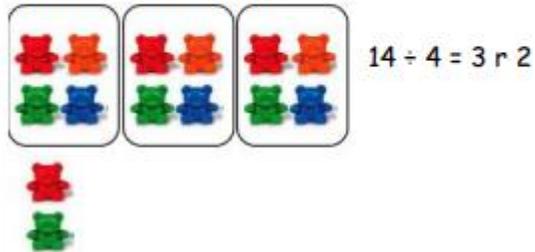
### Division Using Numberlines

Using number lines – Children physically put counters / cubes inside number line where not all increments shown.



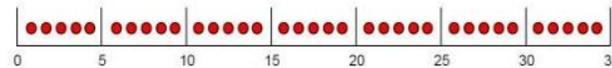
### Dividing with remainders

Divide practical objects into groups and see how many are left over ('remainders'). Cubes, lollipop sticks etc can be used



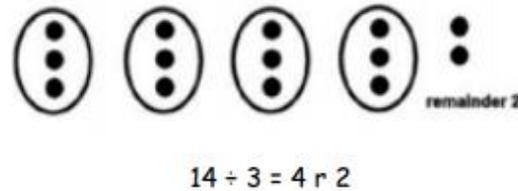
### Division Using Numberlines

Using pictorial representations of number lines to show groupings.



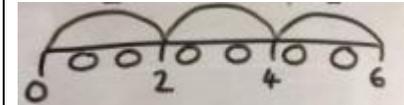
### Dividing with remainders

Children draw pictures to show remainders when dividing



### Division Using Numberlines

Children solve problems by drawing number lines



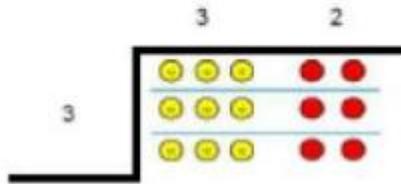
### Dividing with remainders

Children understand that not all numbers divide perfectly (links to times tables)  $12 \div 3 = 4$  (no remainder)  $13 \div 3 = 4 \text{ r } 1$

**Written Method for Division**

Use place value counters to divide using the short division method alongside.

$96 \div 3$



Children begin with no remainders.  
Extend to physically moving the counters and exchanging

$42 \div 3$

Start with the biggest place value.

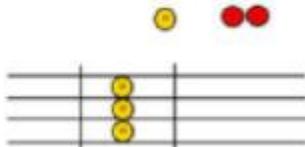


We are

sharing 40 into three groups. We can put 1 ten in each group and we have 1 ten left over.

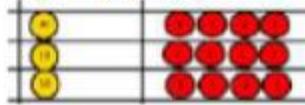


We exchange this ten for 10 ones and then share the ones equally among the groups.



We look at

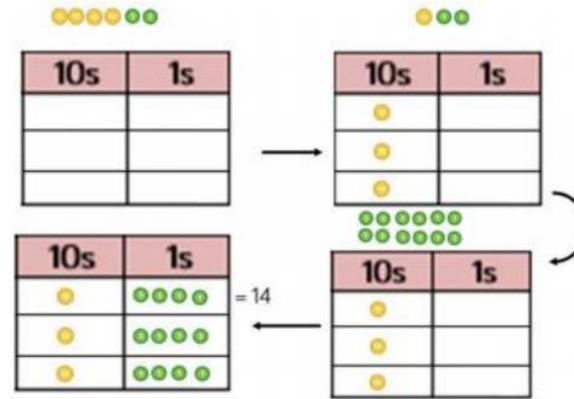
how many are in each group.



Using place value coins or base ten to show remainders

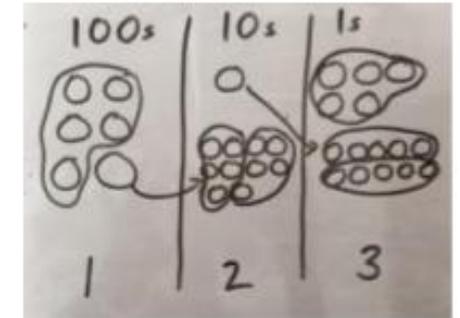
**Written Method for Division**

Children given pictorial representations of place value counters to aid division by annotating



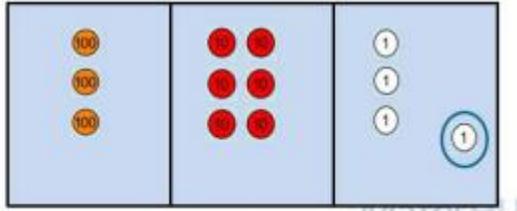
**Written Method for Division**

Represent the place value counters pictorially.



$$364 \div 3 =$$

$$\begin{array}{r} 121 \text{ rem } 1 \\ 3 \overline{) 364} \end{array}$$



Year 4

**Formal written method for division**

Year 5

Children continue to use Base 10 and place value counters to share 3-digit numbers into equal groups. Start with the equipment outside the place value grid before sharing the hundreds, tens and ones equally between the rows.

Year 6

Exchange can also be used

$$844 \div 4 = 211$$

*sharing*

H	T	O
100 100	10	1
100 100	10	1
100 100	10	1
100 100	10	1

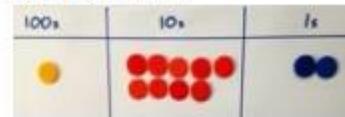
$$856 \div 4 = 214$$

*grouping*

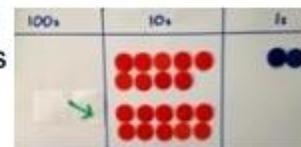
Hundreds	Tens	Ones
100 100 100 100	10 10 10 10	1 1 1 1
100 100 100 100	10 10 10 10	1 1 1 1
		1 1 1 1
		1 1 1 1

**Formal written method for division**

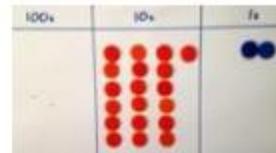
192 ÷ 6 using place value counters to support written method



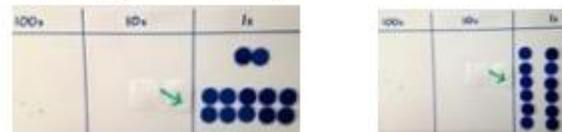
Exchange one 100 for ten 10s



19 tens into groups of 6



3 groups so that is 30 x 6, exchange remaining 10 for ten 1s



**Formal written method for division**

Children use the bus stop method (with and without exchange) writing a help box of multiples for them to refer to when needed.

Begin with divisions that divide equally with no remainder.

$$\begin{array}{r} 218 \\ 4 \overline{) 872} \end{array}$$

Move onto divisions with a remainder. Once children understand remainders,

$$\begin{array}{r} 86 \text{ r } 2 \\ 5 \overline{) 432} \end{array}$$

begin to express as a fraction or decimal

according to the context.

$$\begin{array}{r} 186 \frac{1}{5} \\ 5 \overline{) 931} \end{array}$$

$$4) 57085 \div 7 = 8155$$

$$\begin{array}{r} 08155 \\ 7 \overline{) 5710385} \\ \underline{14} \\ 21 \\ \underline{28} \\ 35 \\ \underline{42} \\ 49 \\ \underline{56} \end{array}$$

$$3) 4593 \div 8 = 574 \frac{1}{8}$$

$$\begin{array}{r} 0574r1 \\ 8 \overline{) 4593} \end{array}$$

$$4) 2210 \div 9 = 245 \frac{5}{9}$$

$$\begin{array}{r} 0245r5 \\ 9 \overline{) 22150} \end{array}$$

**Year 6**

Division by a two-digit number using bus stop method.  
Writing out a help box of multiples to support.

	0	3	6
12	4	$4\frac{3}{3}$	$7\frac{2}{2}$

- $12 \times 1 = 12$
- $12 \times 2 = 24$
- )  $12 \times 3 = 36$
- $12 \times 4 = 48$
- $12 \times 5 = 60$
- $12 \times 6 = 72$
- $12 \times 7 = 84$
- $12 \times 8 = 96$
- $12 \times 7 = 108$
- $12 \times 10 = 120$

$$7,335 \div 15 = 489$$

	0	4	8	9
15	7	$7\frac{3}{3}$	$13\frac{3}{3}$	$13\frac{5}{5}$

15	30	45	60	75	90	105	120	135	150
----	----	----	----	----	----	-----	-----	-----	-----

**Remainders given as fractions and decimals.**

$$) 442 \div 14 = 31\frac{8}{14}$$

$$14 \overline{) 442} \quad 031r8 = \frac{8}{14}$$