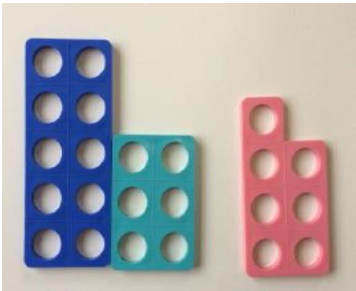
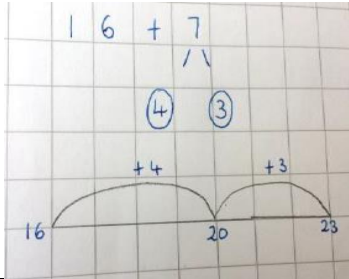


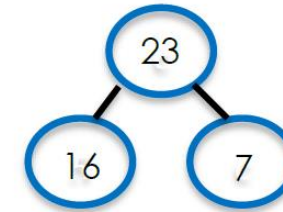
# Year Two

## Addition

<p>Year Two</p>	<p>Pupils should be able to:</p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• solve problems with addition and subtraction: <ul style="list-style-type: none"> <li>○ using concrete objects and pictorial representations, including those involving numbers, quantities and measures</li> <li>○ applying their increasing knowledge of mental and written methods</li> </ul> </li> <li>• recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100</li> <li>• add and subtract numbers using concrete objects, pictorial representations, and mentally, including: <ul style="list-style-type: none"> <li>○ a two-digit number and 1s</li> <li>○ a two-digit number and 10s</li> <li>○ 2 two-digit numbers</li> </ul> </li> <li>• adding 3 one-digit numbers</li> <li>• show that addition of 2 numbers can be done in any order (commutative) and subtraction of 1 number from another cannot</li> <li>• recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems</li> </ul>
<p>Adding a Two-Digit and Ones</p>	
<p>Use of practical apparatus to support adding such as numicon, bead strings, etc</p> <p><math>16 + 7 = 23</math></p> 	<p>Use of part, part whole concept so children partition to use knowledge of number bonds to support adding</p> <p><math>16 + 7 =</math>  <math>16 + 4 = 20</math>  <math>20 + 3 = 23</math></p> 

Mentally counting on from the biggest number using partitioning and part, part whole to support

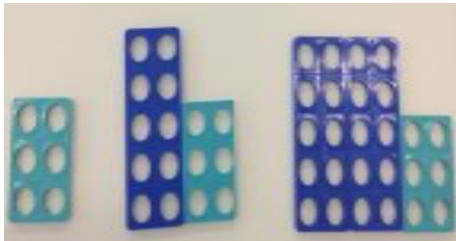
$16 + 7 = 23$   
 $16 + 4 = 20$   
 $20 + 3 = 23$



### Adding Tens to a Number

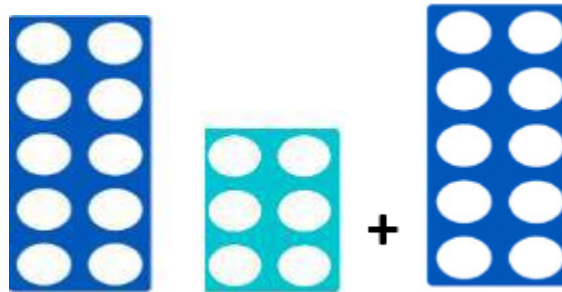
Use of practical apparatus to support adding  
Bead strings  
Numicon  
Dienes  
Hundred square

$6 + 10 = 16$   
 $16 + 10 = 26 \dots$



Through use of pictorials in books and children's jottings to support adding tens

$16 + 10 = 26$



Mentally adding ten to a number in. Children to use knowledge of patterns to add ten to a given number.

$16 + 10 = 26$

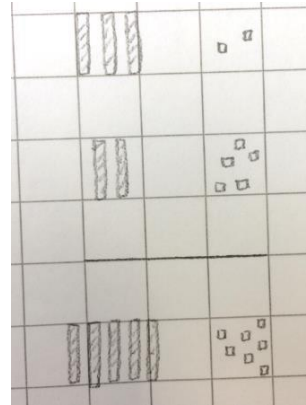
Children can explain the pattern they noticed.

## Adding Two Two-Digit Numbers

Use of dienes to add  
Add together the ones first then the tens  $32 + 25 = 57$



Use of children's drawings of dienes/images of dienes to support understanding  
 $32 + 25 = 57$



Use of the partitioning method to add  
 $32 + 25 = 57$

- Partition the 2 digit numbers
- Arrange in a column
- Add the ones
- Add the tens
- Recombine

$$\begin{array}{r}
 + 30 + 2 \\
 + 20 + 5 \\
 \hline
 50 + 7 = 57
 \end{array}$$

Use of dienes to add  
Add together the ones first then the tens

$$24 + 17 = 41$$

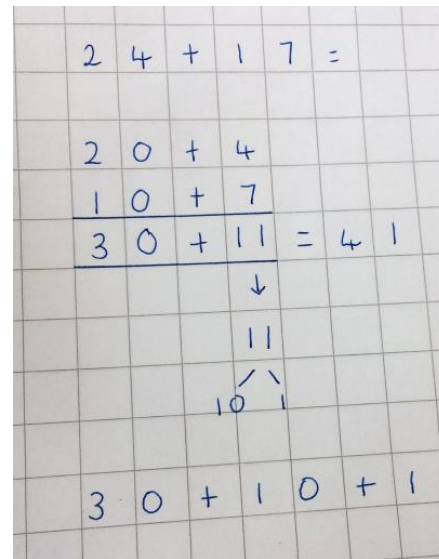
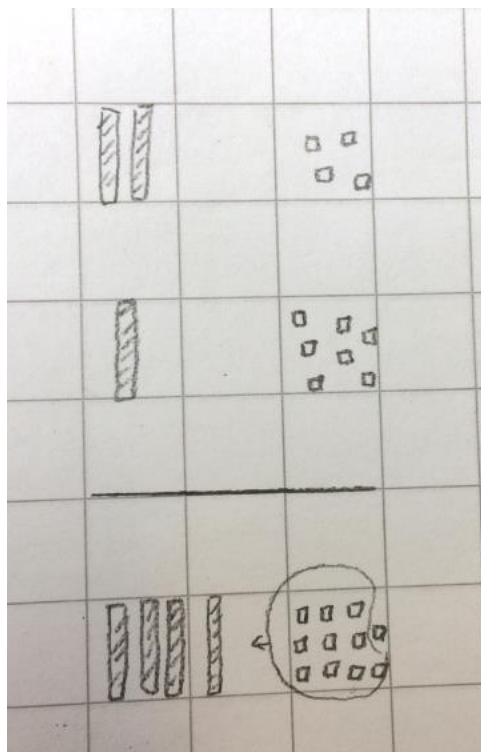
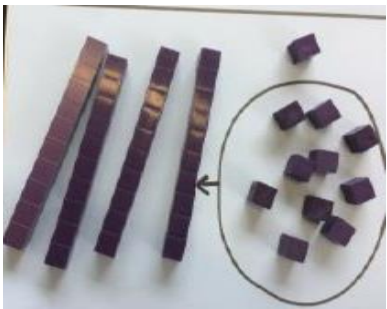
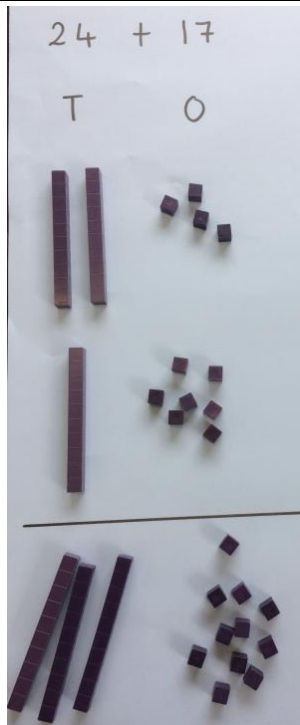
Use of children's drawings of dienes/images of dienes to support understanding

$$24 + 17 = 41$$

Use of the partitioning method to add

- Partition the 2 digit numbers
- Arrange in a column
- Add the ones
- Add the tens
- Recombine

$$24 + 17 = 41$$



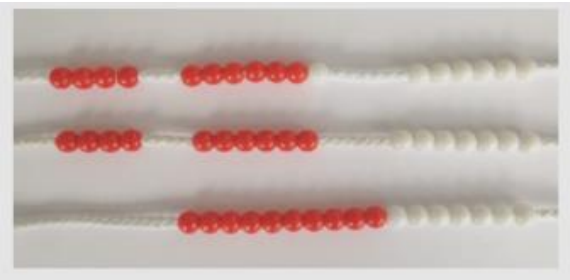
### Adding 3 Single-Digit Numbers

Use of bead strings to show visually

$$4 + 7 + 6 = 17$$

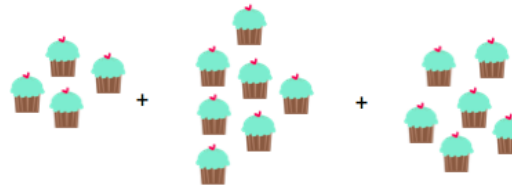
Put 4 and 6 together to make ten. Add on 7

Add together the ones first then the tens

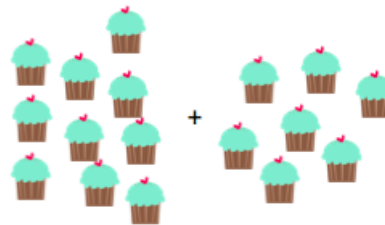


Add together three groups of objects. Draw a picture to recombine the groups to make 10.

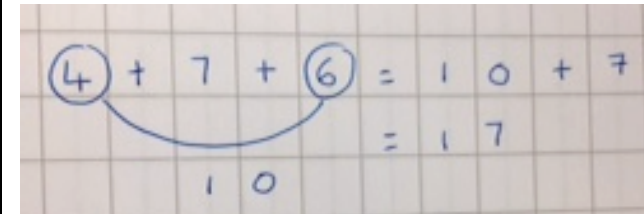
$$4 + 7 + 6 = 17$$




becomes:



Combine the two numbers that make 10 and then add on the remainder.

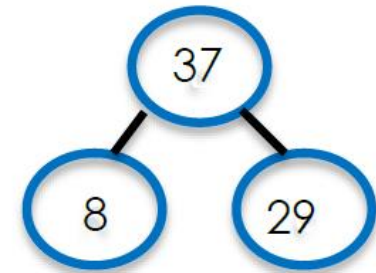


# Subtraction

Year Two	<p>Pupils should be able to:</p> <p>Pupils should be able to:</p> <ul style="list-style-type: none"><li>• solve problems with subtraction:<ul style="list-style-type: none"><li>○ using concrete objects and pictorial representations, including those involving numbers, quantities and measures</li><li>○ applying their increasing knowledge of mental and written methods</li></ul></li><li>• recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100</li><li>• subtract numbers using concrete objects, pictorial representations, and mentally, including:<ul style="list-style-type: none"><li>○ a two-digit number and 1s</li><li>○ a two-digit number and 10s</li><li>○ 2 two-digit numbers</li></ul></li><li>• show that subtraction is not commutative as addition is</li><li>• recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems</li></ul>
<b>Subtracting a Two-Digit and Ones</b>	
<p>Use of practical apparatus to support subtraction such as bead string or unifix /multilink</p> <p><math>37 - 5 = 32</math></p> 	<p>Use of part, part whole concept so children partition to use knowledge of number bonds to support subtraction as well as subtracting to near 10s</p> <p><math>16 - 8 =</math> <math>16 - 6 = 10</math> <math>10 - 2 = 8</math></p>

Mentally counting back from the biggest number using partitioning and part, part whole to support

$$37 - 8 =$$
$$37 - 7 = 30$$
$$37 \dots 36 \dots 35 \dots \text{etc}$$
$$30 - 1 = 29$$



### Subtracting Tens from a Number

Use of practical apparatus to support subtracting

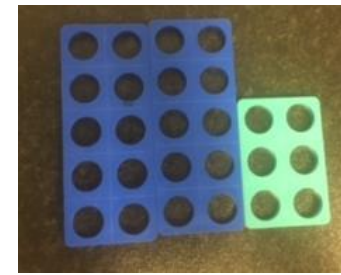
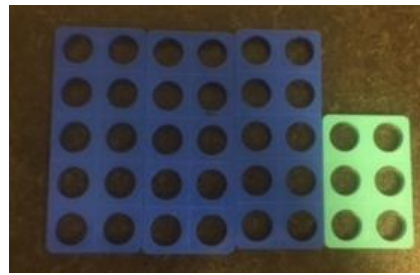
Bead strings

Numicon

Dienes

Hundred square

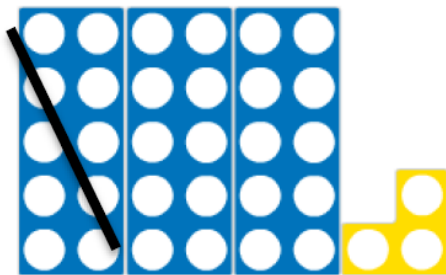
$$46 - 10 = 36$$
$$36 - 10 = 26 \dots$$



Through use of pictorials in books and children's jottings to support subtracting

10s. Children physically cross out

$$33 - 10 = 23$$



Mentally subtracting ten from a number. Children to use knowledge of

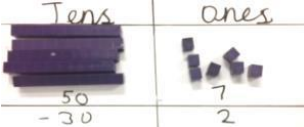





patterns to subtract tens

$$35 - 10 = 25$$

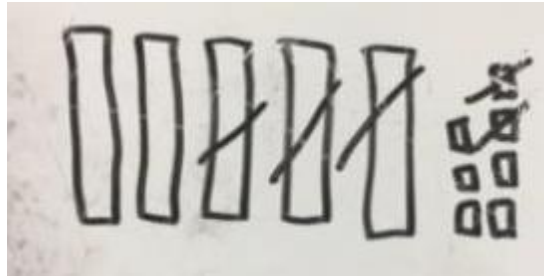
Children can explain the pattern they noticed.

### Subtracting Two Two-Digit Numbers

Use of dienes to subtract  
Subtract the ones first then the tens

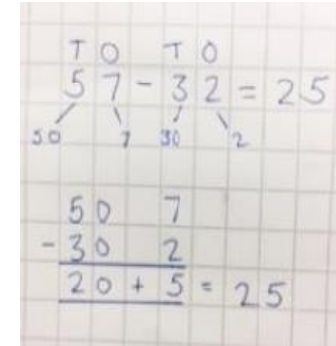
Tens	ones	$57 - 32 = 25$
		
		
Tens	ones	
		
$\begin{array}{r} 50 \\ - 30 \\ \hline 20 \end{array}$	$\begin{array}{r} 7 \\ - 2 \\ \hline 5 \end{array}$	$+ = 25$

Use of children's drawings of dienes/images of dienes to support understanding –Children will physically cross out.  
 $57 - 32 = 25$



Use of the partitioning method to subtract  
 $57 - 32 = 25$

- Partition the 2 digit numbers
- Arrange in a column
- Subtract the ones
- Subtract the tens
- Recombine



Use of dienes to subtract

Subtract the ones first. Must regroup in order to subtract the ones. Take a ten and add it to the ones column.  
Now subtract the ones, then subtract the tens  
Recombine

$34 - 17 =$

Use of children's drawings of dienes/images of dienes to support understanding

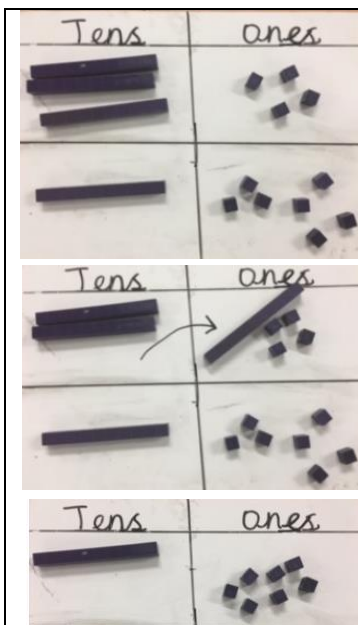
$34 - 17 =$

Use of the partitioning method to subtract

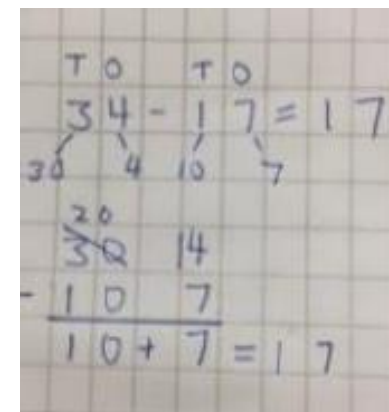
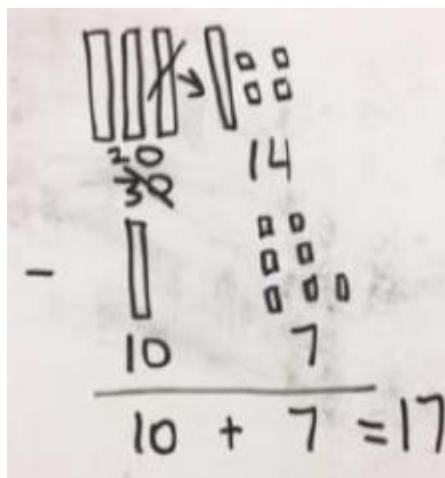
- Partition the 2 digit numbers
- Arrange in a column
- Regroup the tens if cannot subtract the ones
- Subtract the ones
- Subtract the tens
- Recombine

$34 - 17 =$



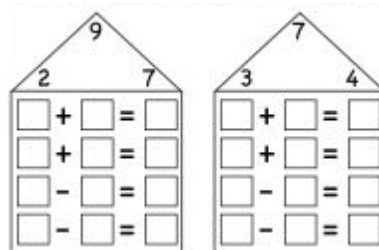
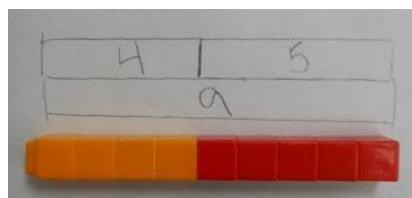


Children can draw or use a picture of dienes to physically cross out/draw when subtracting.



### Using the inverse

Children use a bar model to support understanding that addition is commutative (can be done in any order) but subtraction is not.



Children use knowledge of subtraction sentences to say related addition facts  
If I know that ...

20 + 21 = 41 then I also know...

41 - 21 = 20 etc

Children move away from counting on/back to find the missing number to rearranging the number sentence and using the inverse

Children should understand commutativity of addition when using the inverse

\_\_\_\_\_ - 25 = 42

$55 + \underline{\quad} = 75$

$75 - 55 =$

Then use known methods to solve

$42 + 25 =$

$25 + 42 =$

Children understand the relationship between addition and subtraction by using the inverse to check calculations are correct

Handwritten work on grid paper showing the inverse relationship between subtraction and addition. The top part shows the subtraction  $57 - 32 = 25$  with place value labels 'T O' above '5 7' and '3 2', and arrows pointing from the tens and ones digits to their respective place values: 50, 7, 30, and 2. Below this, the subtraction is performed using a horizontal line:  $50 \quad 7$  minus  $30 \quad 2$  equals  $20 + 5 = 25$  with a checkmark.

Handwritten work on grid paper showing the inverse relationship between addition and subtraction. The top part shows the addition  $32 + 25 = 57$  with place value labels 'T O' above '3 2' and '2 5', and arrows pointing from the tens and ones digits to their respective place values: 30, 2, 20, and 5. Below this, the addition is performed using a horizontal line:  $30 \quad 2$  plus  $20 \quad 5$  equals  $50 + 7 = 57$ .

# Multiplication

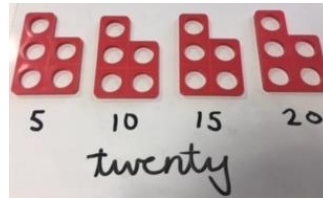
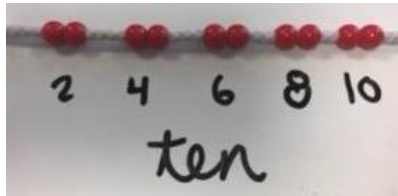
Year Two

Pupils should be able to:

- recall and use multiplication facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers
- calculate mathematical statements for multiplication within the multiplication tables and write them using the multiplication ( $\times$ ) and equals ( $=$ ) signs
- show that multiplication of two numbers can be done in any order (commutative)
- solve problems involving multiplication, using materials, arrays, repeated addition, mental methods, and multiplication facts, including problems in contexts

## Count in Multiples

Use of practical apparatus to support counting in multiples of 2, 3, 5, and 10



Use of pictorials to support counting on in multiples



15  
Fifteen

3 groups of 5 is 15



6  
Six

3 groups of 2 is 6

Mentally counting on in multiples. Children should use pattern spotting to support their understanding of multiples.

0, 5, 10, 15,...

'Multiples of 5 end in 0 and 5 only. They are even and odd numbers.'

'48 cannot be a multiple of 5 because it doesn't end in a 0 or 5'

### Repeated Addition

Children use concrete materials to understand multiplication as addition



$$5 + 5 + 5 + 5 = 20$$
$$4 \times 5 = 20$$



$$2 + 2 + 2 + 2 + 2 = 10$$
$$5 \times 2 = 10$$

Use of pictorials in books or drawings to support understanding multiplication as addition

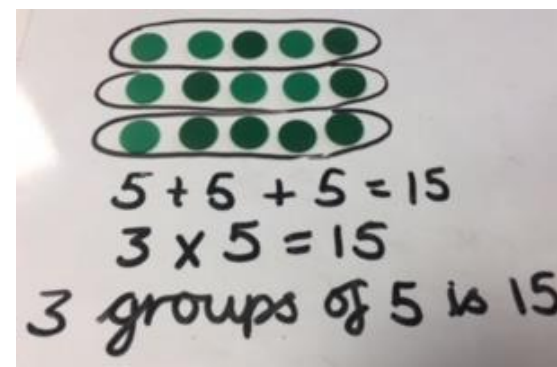
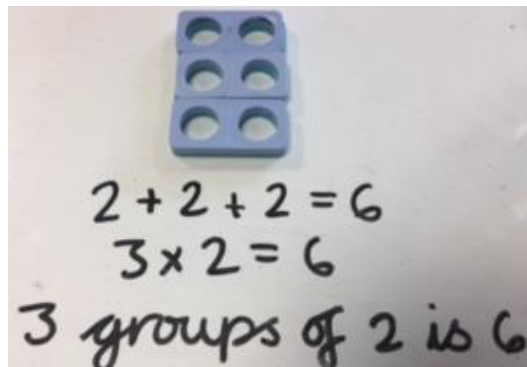
$$2 \times 2 = 4$$
$$3 \times 2 = 6$$
$$4 \times 2 = 8$$



### Arrays

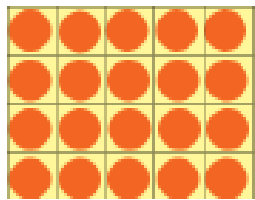
Use of practical apparatus to support solving multiplication problems using arrays.

- Counters
- Numicon



Through use of pictorials in books, children can count total in multiples to solve

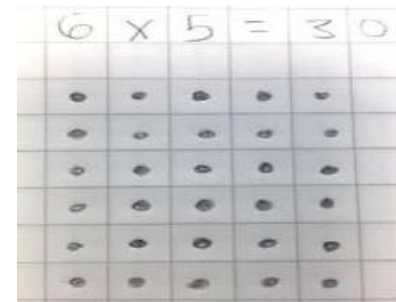
Children can draw an array as a method to solve problems



$$5 + 5 + 5 + 5 = 20$$

$$4 \times 5 = 20$$

Twenty



### Commutative Relationship

Use of concrete resources to show that multiplication can be done in any order

$$3 \times 5 = 15$$

$$5 \times 3 = 15$$



Move and draw arrays in different ways to show the commutative relationship



$$5 + 5 + 5 = 15$$

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

$$5 \times 3 = 15$$

$$3 \times 5 = 15$$



$$2 \times 4 = 8$$

$$4 \times 2 = 8$$

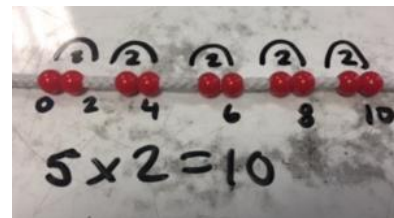


$$2 \times 4 = 8$$

$$4 \times 2 = 8$$

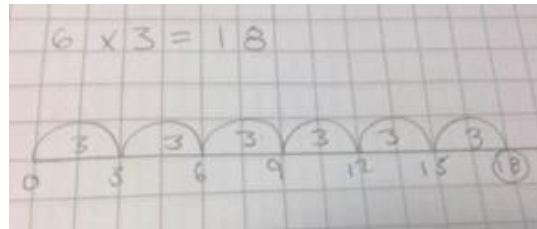
### Number Line

Children can use counting beads or Cuisenaire rods to support their understanding of using an empty number line to solve multiplication problems.



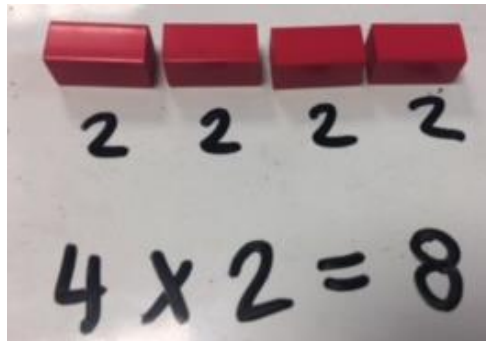
Children can move on to solving more abstractly through an empty number line to solve multiplication problems.

- Start at 0
- Count on in the multiple
- Write the total amount

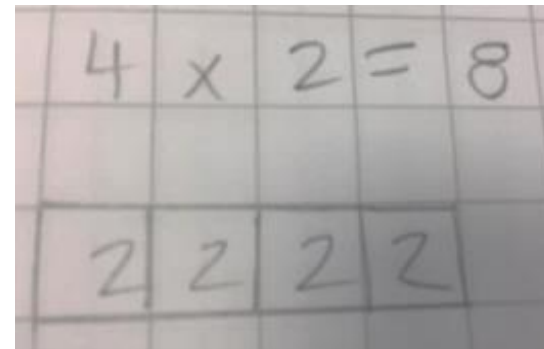


### Bar Model

Children can use practical resources such as Cuisenaire rods to solve using a bar model



Then children use pictorial images to support and then moving on to abstractly drawing their own to solve multiplication problems.



# Division

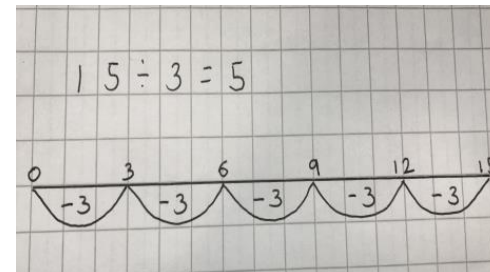
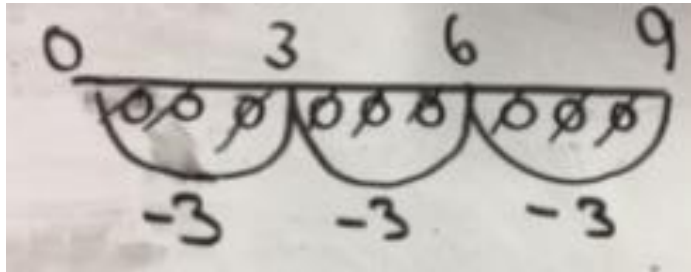
Year Three

Pupils should be able to:

- Recall and use division facts for the 3, 4 and 8 multiplication tables
- Write and calculate mathematical statements for division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods

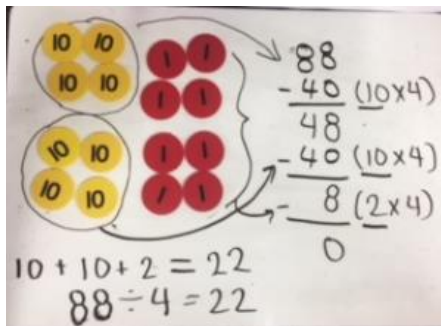
## Repeated Subtraction

Children use previous methods learned in year 2, but focus on aspect of repeated subtraction to prepare for subtracting when chunking.



## Chunking

Children can use place value counters as well as drawings to support this method conceptually.



Children should be encouraged to write down the related time tables facts to support them with the formal method of chunking.

