



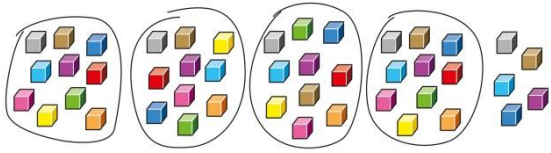
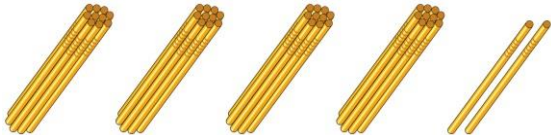
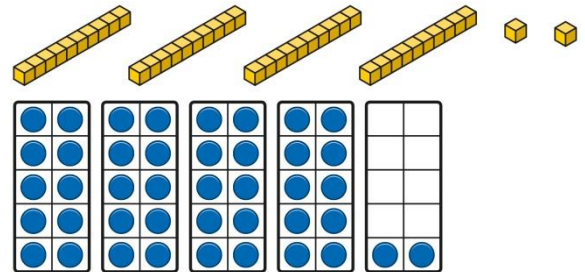
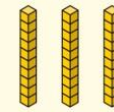

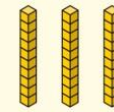

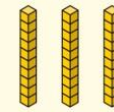


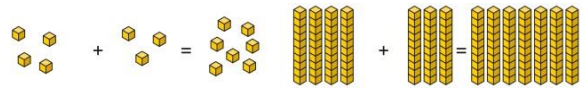
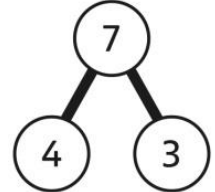
St John's C of E Primary School, Danbury



Mathematics calculation policy, KS1 Year 2

The following pages show the Maths progression in calculation (addition, subtraction, multiplication and division) and how this works in line with the National Curriculum. The consistent use of the CPA (concrete, pictorial, abstract) approach across Maths helps children develop mastery across all the operations in an efficient and reliable way. This policy shows how these methods develop children's confidence in their understanding of both written and mental methods.

Year 2

	Concrete	Pictorial	Abstract										
Year 2 Addition													
Understanding 10s and 1s	<p>Group objects into 10s and 1s.</p>  <p>Bundle straws to understand unitising of 10s.</p> 	<p>Understand 10s and 1s equipment, and link with visual representations on ten frames.</p> 	<p>Represent numbers on a place value grid, using equipment or numerals.</p> <table border="1" data-bbox="1534 486 1848 813"> <thead> <tr> <th>Tens</th> <th>Ones</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> </tr> <tr> <td>3</td> <td>2</td> </tr> <tr> <th>Tens</th> <th>Ones</th> </tr> <tr> <td>4</td> <td>3</td> </tr> </tbody> </table>	Tens	Ones			3	2	Tens	Ones	4	3
Tens	Ones												
													
3	2												
Tens	Ones												
4	3												
Adding 10s	<p>Use known bonds and unitising to add 10s.</p>  <p><i>I know that 4 + 3 = 7. So, I know that 4 tens add 3 tens is 7 tens.</i></p>	<p>Use known bonds and unitising to add 10s.</p>  <p><i>I know that 4 + 3 = 7. So, I know that 4 tens add 3 tens is 7 tens.</i></p>	<p>Use known bonds and unitising to add 10s.</p>  <p>$4 + 3 = \square$</p> <p>$4 + 3 = 7$ $4 \text{ tens} + 3 \text{ tens} = 7 \text{ tens}$ $40 + 30 = 70$</p>										
Adding a 1-digit number	<p>Add the 1s to find the total. Use known bonds within 10.</p>	<p>Add the 1s.</p>	<p>Add the 1s.</p>										

to a 2-digit number not bridging a 10



41 is 4 tens and 1 one.
41 add 6 ones is 4 tens and 7 ones.

This can also be done in a place value grid.

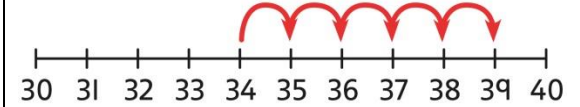
T	O



34 is 3 tens and 4 ones.
4 ones and 5 ones are 9 ones.
The total is 3 tens and 9 ones.

T	O

Understand the link between counting on and using known number facts. Children should be encouraged to use known number bonds to improve efficiency and accuracy.



This can be represented horizontally or vertically.

$$34 + 5 = 39$$

or

T	O
3	4
+	5
	9

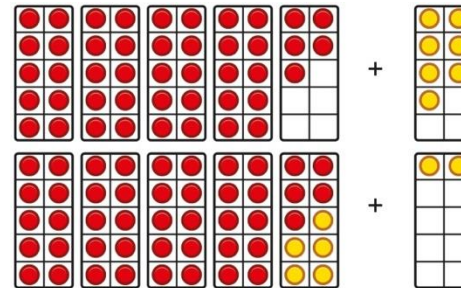
Adding a 1-digit number to a 2-digit number bridging 10

Complete a 10 using number bonds.

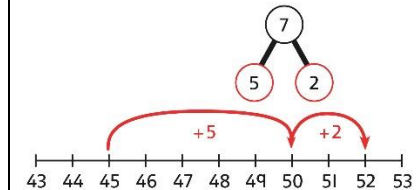


There are 4 tens and 5 ones.
I need to add 7. I will use 5 to complete a 10, then add 2 more.

Complete a 10 using number bonds.



Complete a 10 using number bonds.



$$7 = 5 + 2$$

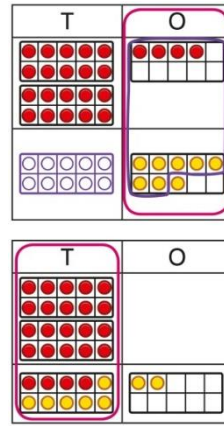
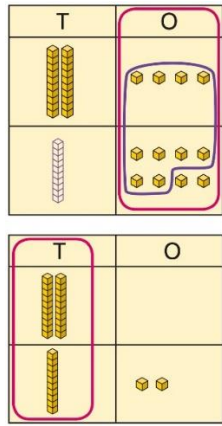
$$45 + 5 + 2 = 52$$

Adding a 1-digit number to a 2-digit number using exchange

Exchange 10 ones for 1 ten.

Exchange 10 ones for 1 ten.

Exchange 10 ones for 1 ten.



Adding a multiple of 10 to a 2-digit number

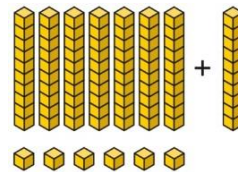
Add the 10s and then recombine.



27 is 2 tens and 7 ones.
50 is 5 tens.

There are 7 tens in total and 7 ones.
So, $27 + 50$ is 7 tens and 7 ones.

Add the 10s and then recombine.



66 is 6 tens and 6 ones.
 $66 + 10 = 76$

A 100 square can support this understanding.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Add the 10s and then recombine.

$$37 + 20 = ?$$

$$30 + 20 = 50$$

$$50 + 7 = 57$$

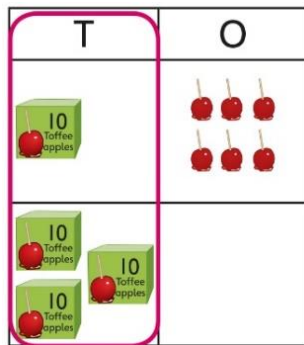
$$37 + 20 = 57$$

Adding a multiple of 10 to a 2-digit number using columns

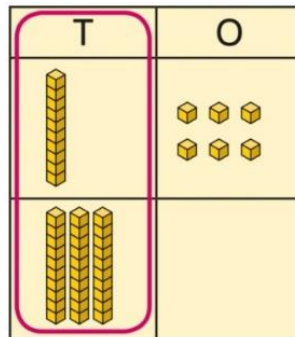
Add the 10s using a place value grid to support.

Add the 10s using a place value grid to support.

Add the 10s represented vertically. Children must understand how the method relates to unitising of 10s and place value.



16 is 1 ten and 6 ones.
30 is 3 tens.
There are 4 tens and 6 ones in total.



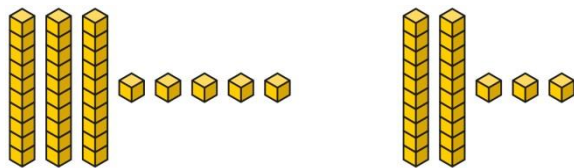
16 is 1 ten and 6 ones.
30 is 3 tens.
There are 4 tens and 6 ones in total.

T	O
1	6
3	0
4	6

$1 + 3 = 4$
 $1 \text{ ten} + 3 \text{ tens} = 4 \text{ tens}$
 $16 + 30 = 46$

Adding two 2-digit numbers

Add the 10s and 1s separately.

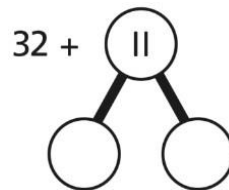


$5 + 3 = 8$
There are 8 ones in total.

$3 + 2 = 5$
There are 5 tens in total.

$35 + 23 = 58$

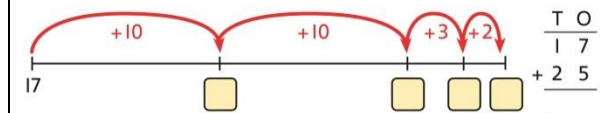
Add the 10s and 1s separately. Use a part-whole model to support.



$11 = 10 + 1$
 $32 + 10 = 42$
 $42 + 1 = 43$

$32 + 11 = 43$

Add the 10s and the 1s separately, bridging 10s where required. A number line can support the calculations.

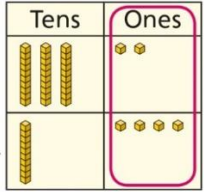
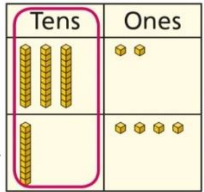
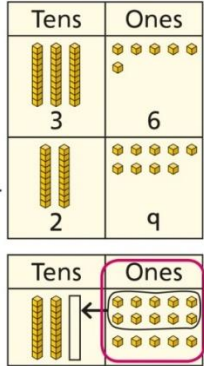
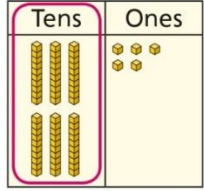


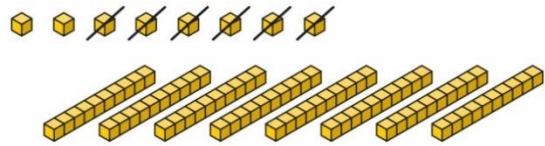
$17 + 25$

Adding two 2-digit numbers using a place value grid

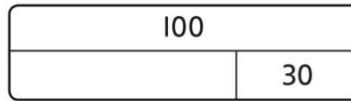
Add the 1s. Then add the 10s.

Add the 1s. Then add the 10s.

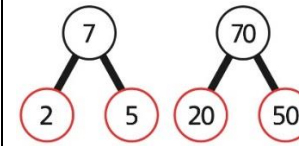
	 		$\begin{array}{r} \text{T} \text{ O} \\ 3 \ 2 \\ + 1 \ 4 \\ \hline 6 \end{array}$ $\begin{array}{r} \text{T} \text{ O} \\ 3 \ 2 \\ + 1 \ 4 \\ \hline 4 \ 6 \end{array}$
Adding two 2-digit numbers with exchange	<p>Add the 1s. Exchange 10 ones for a ten. Then add the 10s.</p>  		<p>Add the 1s. Exchange 10 ones for a ten. Then add the 10s.</p> $\begin{array}{r} \text{T} \text{ O} \\ 3 \ 6 \\ + 2 \ 9 \\ \hline 5 \end{array}$ $\begin{array}{r} \text{T} \text{ O} \\ 3 \ 6 \\ + 2 \ 9 \\ \hline 6 \ 5 \end{array}$
Year 2 Subtraction			
Subtracting multiples of 10	Use known number bonds and unitising to subtract multiples of 10.	Use known number bonds and unitising to subtract multiples of 10.	Use known number bonds and unitising to subtract multiples of 10.



8 subtract 6 is 2.
So, 8 tens subtract 6 tens is 2 tens.



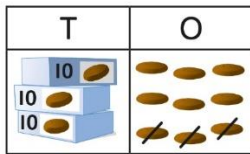
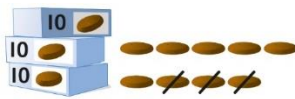
$10 - 3 = 7$
So, 10 tens subtract 3 tens is 7 tens.



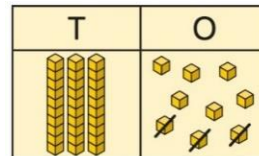
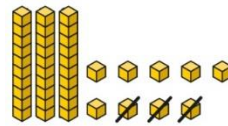
7 tens subtract 5 tens is 2 tens.
 $70 - 50 = 20$

Subtracting a single-digit number

Subtract the 1s. This may be done in or out of a place value grid.



Subtract the 1s. This may be done in or out of a place value grid.



Subtract the 1s. Understand the link between counting back and subtracting the 1s using known bonds.

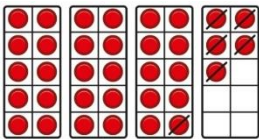


T	O	
3	9	
-	3	
3	6	

$9 - 3 = 6$
 $39 - 3 = 36$

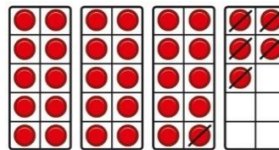
Subtracting a single-digit number bridging 10

Bridge 10 by using known bonds.



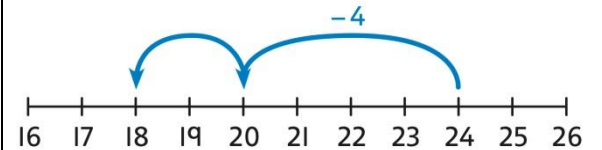
$35 - 6$
I took away 5 counters, then 1 more.

Bridge 10 by using known bonds.



$35 - 6$
First, I will subtract 5, then 1.

Bridge 10 by using known bonds.



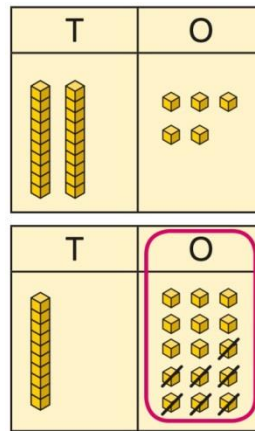
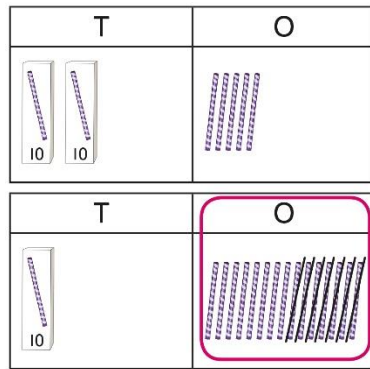
$24 - 6 = ?$
 $24 - 4 - 2 = ?$

Subtracting a single-digit number using exchange

Exchange 1 ten for 10 ones. This may be done in or out of a place value grid.

Exchange 1 ten for 10 ones.

Exchange 1 ten for 10 ones.



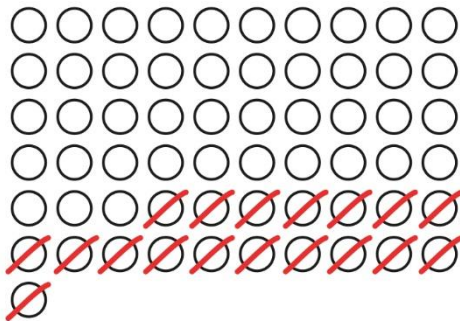
$$\begin{array}{r} \text{T} \quad \text{O} \\ 25 \\ - 7 \\ \hline 18 \end{array}$$

$$\begin{array}{r} \text{T} \quad \text{O} \\ 25 \\ - 7 \\ \hline 18 \end{array}$$

$$25 - 7 = 18$$

Subtracting a 2-digit number

Subtract by taking away.



$$61 - 18$$

I took away 1 ten and 8 ones.

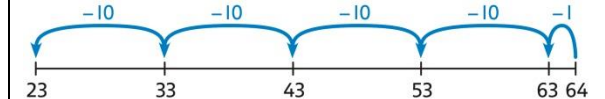
Subtract the 10s and the 1s.

This can be represented on a 100 square.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Subtract the 10s and the 1s.

This can be represented on a number line.

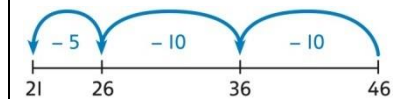


$$64 - 41 = ?$$

$$64 - 1 = 63$$

$$63 - 40 = 23$$

$$64 - 41 = 23$$



$$46 - 20 = 26$$

$$26 - 5 = 21$$

$$46 - 25 = 21$$



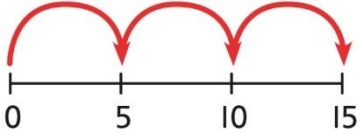

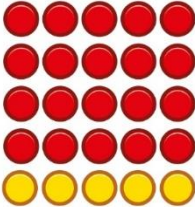
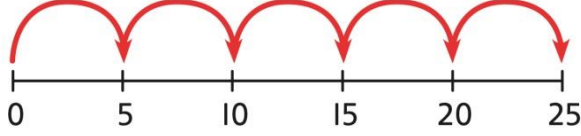

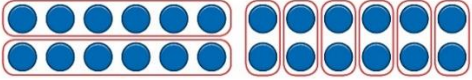

Subtracting a 2-digit number using place value and

Subtract the 1s. Then subtract the 10s. This may be done in or out of a place value grid.

Subtract the 1s. Then subtract the 10s.

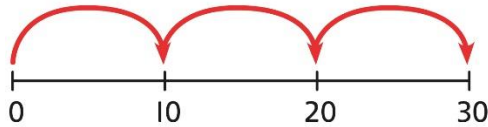
Using column subtraction, subtract the 1s. Then subtract the 10s.

<p>columns</p>	<table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th style="width: 50%;">T</th> <th style="width: 50%;">O</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> </tr> </tbody> </table> <p>$38 - 16 = 22$</p>	T	O			<table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th style="width: 50%;">Tens</th> <th style="width: 50%;">Ones</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> </tr> </tbody> </table>	Tens	Ones			<table style="width: 100%; text-align: center;"> <thead> <tr> <th style="width: 50%;">T</th> <th style="width: 50%;">O</th> </tr> </thead> <tbody> <tr> <td>4</td> <td>5</td> </tr> <tr> <td>- 1</td> <td>2</td> </tr> <tr> <td style="border-top: 1px solid black;">3</td> <td style="border-top: 1px solid black;">3</td> </tr> </tbody> </table> <table style="width: 100%; text-align: center;"> <thead> <tr> <th style="width: 50%;">T</th> <th style="width: 50%;">O</th> </tr> </thead> <tbody> <tr> <td>4</td> <td>5</td> </tr> <tr> <td>- 1</td> <td>2</td> </tr> <tr> <td style="border-top: 1px solid black;">3</td> <td style="border-top: 1px solid black;">3</td> </tr> </tbody> </table>	T	O	4	5	- 1	2	3	3	T	O	4	5	- 1	2	3	3																
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<p>Subtracting a 2-digit number with exchange</p>		<p>Exchange 1 ten for 10 ones. Then subtract the 1s. Then subtract the 10s.</p> <table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th style="width: 50%;">Tens</th> <th style="width: 50%;">Ones</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> </tr> </tbody> </table> <table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th style="width: 50%;">Tens</th> <th style="width: 50%;">Ones</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> </tr> </tbody> </table> <table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th style="width: 50%;">Tens</th> <th style="width: 50%;">Ones</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> </tr> </tbody> </table> <table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th style="width: 50%;">Tens</th> <th style="width: 50%;">Ones</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> </tr> </tbody> </table>	Tens	Ones			Tens	Ones			Tens	Ones			Tens	Ones			<p>Using column subtraction, exchange 1 ten for 10 ones. Then subtract the 1s. Then subtract the 10s.</p> <table style="width: 100%; text-align: center;"> <thead> <tr> <th style="width: 50%;">T</th> <th style="width: 50%;">O</th> </tr> </thead> <tbody> <tr> <td>4</td> <td>5</td> </tr> <tr> <td>- 2</td> <td>7</td> </tr> <tr> <td style="border-top: 1px solid black;">2</td> <td style="border-top: 1px solid black;">2</td> </tr> </tbody> </table> <table style="width: 100%; text-align: center;"> <thead> <tr> <th style="width: 50%;">T</th> <th style="width: 50%;">O</th> </tr> </thead> <tbody> <tr> <td>3</td> <td>15</td> </tr> <tr> <td>- 2</td> <td>7</td> </tr> <tr> <td style="border-top: 1px solid black;">1</td> <td style="border-top: 1px solid black;">8</td> </tr> </tbody> </table> <table style="width: 100%; text-align: center;"> <thead> <tr> <th style="width: 50%;">T</th> <th style="width: 50%;">O</th> </tr> </thead> <tbody> <tr> <td>3</td> <td>15</td> </tr> <tr> <td>- 2</td> <td>7</td> </tr> <tr> <td style="border-top: 1px solid black;">1</td> <td style="border-top: 1px solid black;">8</td> </tr> </tbody> </table>	T	O	4	5	- 2	7	2	2	T	O	3	15	- 2	7	1	8	T	O	3	15	- 2	7	1	8
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<p>Year 2 Multiplication</p>																																											
<p>Equal groups and repeated</p>	<p>Recognise equal groups and write as repeated addition and as multiplication.</p>	<p>Recognise equal groups using standard objects such as counters and write as</p>	<p>Use a number line and write as repeated addition and as multiplication.</p>																																								

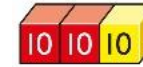
<p>addition</p>	 <p>3 groups of 5 chairs 15 chairs altogether</p>	<p>repeated addition and multiplication.</p>  <p>3 groups of 5 15 in total</p>	 <p>$5 + 5 + 5 = 15$ $3 \times 5 = 15$</p>
<p>Using arrays to represent multiplication and support understanding</p>	<p>Understand the relationship between arrays, multiplication and repeated addition.</p>  <p>4 groups of 5</p>	<p>Understand the relationship between arrays, multiplication and repeated addition.</p>  <p>4 groups of 5 ... 5 groups of 5</p>	<p>Understand the relationship between arrays, multiplication and repeated addition.</p>  <p>$5 \times 5 = 25$</p>
<p>Understanding commutativity</p>	<p>Use arrays to visualise commutativity.</p>  <p>I can see 6 groups of 3. I can see 3 groups of 6.</p>	<p>Form arrays using counters to visualise commutativity. Rotate the array to show that orientation does not change the multiplication.</p>  <p>This is 2 groups of 6 and also 6 groups of 2.</p>	<p>Use arrays to visualise commutativity.</p>  <p>$4 + 4 + 4 + 4 + 4 = 20$ $5 + 5 + 5 + 5 = 20$ $4 \times 5 = 20$ and $5 \times 4 = 20$</p>
<p>Learning $\times 2$, $\times 5$ and $\times 10$ table facts</p>	<p>Develop an understanding of how to unitise groups of 2, 5 and 10 and learn corresponding times-table facts.</p>	<p>Understand how to relate counting in unitised groups and repeated addition with knowing key times-table facts.</p>	<p>Understand how the times-tables increase and contain patterns.</p>



3 groups of 10 ... 10, 20, 30
 $3 \times 10 = 30$



$10 + 10 + 10 = 30$
 $3 \times 10 = 30$



$5 \times 10 = 50$
 $6 \times 10 = 60$

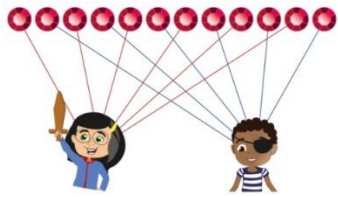
**Year 2
 Division**

**Sharing
 equally**

Start with a whole and share into equal parts, one at a time.

Represent the objects shared into equal parts using a bar model.

Use a bar model to support understanding of the division.



12 shared equally between 2.
They get 6 each.

Start to understand how this also relates to grouping. To share equally between 3 people, take a group of 3 and give 1 to each person. Keep going until all the objects have been shared

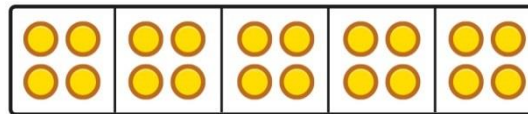


15

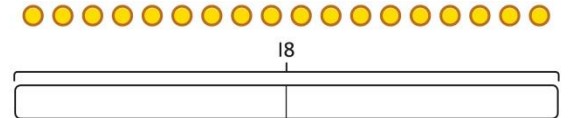


They get 5  each.

15 shared equally between 3.
They get 5 each.



20 shared into 5 equal parts.
There are 4 in each part.



$$18 \div 2 = 9$$

Grouping equally





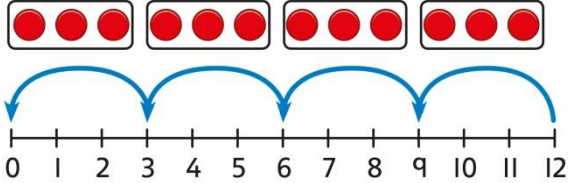
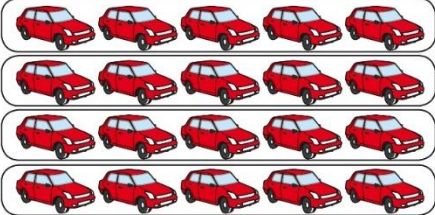
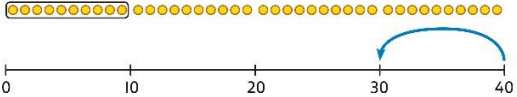
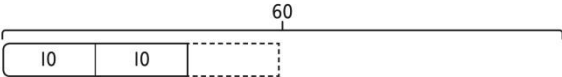
Understand how to make equal groups from a whole.



8 divided into 4 equal groups.
There are 2 in each group.

Understand the relationship between grouping and the division statements.

Understand how to relate division by grouping to repeated subtraction.

		<p>$12 \div 3 = 4$</p>  <p>$12 \div 4 = 3$</p>  <p>$12 \div 6 = 2$</p>  <p>$12 \div 2 = 6$</p> 	 <p>There are 4 groups now.</p> <p><i>12 divided into groups of 3.</i> $12 \div 3 = 4$</p> <p><i>There are 4 groups.</i></p>
<p>Using known times-tables to solve divisions</p>	<p>Understand the relationship between multiplication facts and division.</p>  <p><i>4 groups of 5 cars is 20 cars in total. 20 divided by 4 is 5.</i></p>	<p>Link equal grouping with repeated subtraction and known times-table facts to support division.</p>  <p><i>40 divided by 4 is 10.</i></p> <p>Use a bar model to support understanding of the link between times-table knowledge and division.</p> 	<p>Relate times-table knowledge directly to division.</p> <p> $1 \times 10 = 10$ $2 \times 10 = 20$ $3 \times 10 = 30$ $4 \times 10 = 40$ $5 \times 10 = 50$ $6 \times 10 = 60$ $7 \times 10 = 70$ $8 \times 10 = 80$ </p> <div style="border: 1px solid orange; border-radius: 15px; padding: 10px; width: fit-content; margin: 10px auto;"> <p>I used the 10 times-table to help me. $3 \times 10 = 30$.</p> </div> <p><i>I know that 3 groups of 10 makes 30, so I know that 30 divided by 10 is 3.</i></p> <p>$3 \times 10 = 30$ so $30 \div 10 = 3$</p>