



Ashton West End Primary Academy

KS1 and KS2 Calculation Policy 2021-2022

Vision:

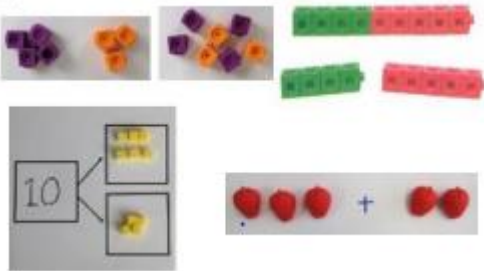
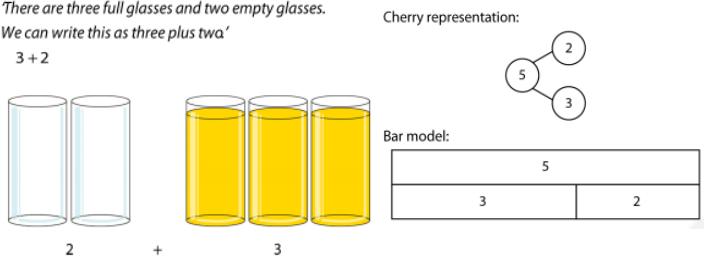

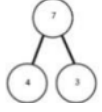
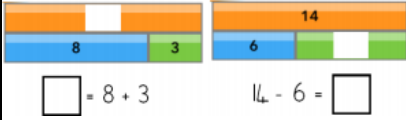
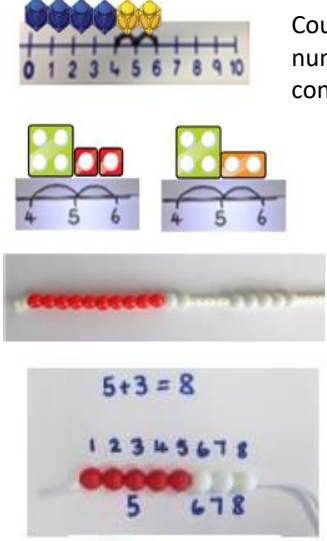
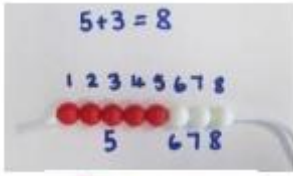
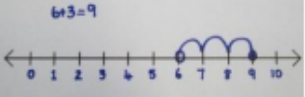
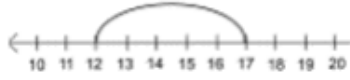

In our multicultural and eco- friendly school, we celebrate differences and encourage mutual respect. We support each other and our community to work together and take pride in the things we do. We demonstrate perseverance, inclusion and respect. Everyone is welcome!

September 2021

This calculation policy reflects the methods taught pictorially, concretely and abstractly to the maths National Curriculum objectives (2014). Teachers should use this to help with their planning, as well as guiding children to build and develop their mathematical skills and methods.

Due to missed learning throughout the Covid-19 crisis of lockdowns and isolations; Ashton West End Primary Academy's staff scrutinise their maths planning to help plug in any missed learning. Throughout 2020-2021, teachers were given extra maths learning time to plug in gaps based on learning evidence from the children in assessments and lessons. Teachers were also given mandatory concepts to plug into the children before leaving their previous class to help them have prior learning knowledge in their current class.

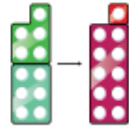
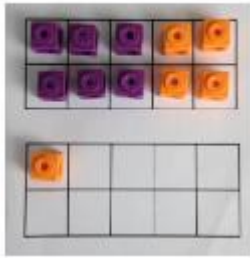
Teachers should refer to these methods in the calculation policy and apply them to the preferred year group. Teachers may need to refer to the previous year group to help consolidate learning. This will help to ensure children are being taught these efficient calculation methods to achieve the National Curriculum maths objectives.

Objective and Strategy	Concrete	Pictorial	Abstract
<p>Combing two parts to make a whole: part-whole model</p>	<p>Use part part whole models. Use cubes to add two numbers together as a group or in a bar.</p> 	<p>Using pictures to add two numbers together as a group or in a bar.</p> <p>There are three full glasses and two empty glasses. We can write this as three plus two. $3 + 2$</p>  <p>There are two empty glasses and three full glasses. We can write this as two plus three. $2 + 3$</p> 	<p>Use the part-part-whole diagram to move into the abstract.</p> <p>$4 + 3 = 7$ (4 is a part, 3 is a part, 7 is a whole)</p>  <p>$2 + 3 = 5$ $5 = 3 + 2$ $2 + \square = 5$ $2 + 3 = \square$</p> <p>$3 + 2 = 5$ $5 = 2 + 3$ $\square + 3 = 5$</p> <p>Bar models used to show relationship between addition and subtraction.</p> 
<p>Starting at the bigger number and counting on.</p>	<p>Counting on using number lines using concrete resources.</p>  <p>Start with the larger number on the bead string and the count on to find the smaller number, 1 by 1, to find the answer.</p> <p>$5 + 3 = 8$</p> 	<p>Use a number line to count on in ones or in one jump to find the answer. Starting at the larger number on the number line.</p>  <p>$12 + 5 = 17$</p> 	<p>$5 + 12 = 17$ Place the larger number in your head and count on the smaller number to find your answer.</p> <p>Counting on using twos. The abstract number line: What is 2 more than 4? What is the sum of 2 and 4? What is the total of 4 and 2? $4 + 2$</p> 

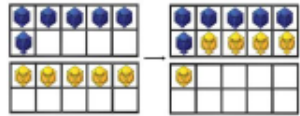
Regrouping to make 10

Using ten frames and concrete resources. Using Numicon for an alternative.

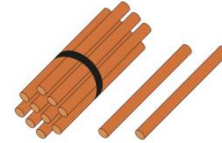
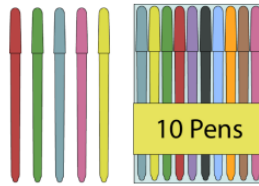
$6 + 5 = 11$



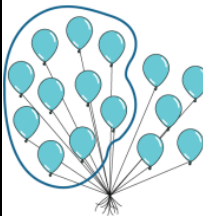
$6 + 5$



Using pictures of objects and regroup or partition the smaller number to make 10. Starting to applying tens and ones.



Ten ones are visible:

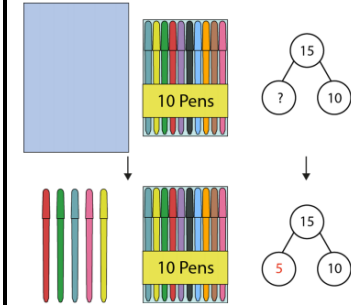


10s	1s
1	5

'The 1 means one ten, and the 5 means five ones.'

Developing an understanding of grouping ten and applying this into a part part whole model or into equations to develop equality.

'Sara has fifteen pens. How many are hidden?'

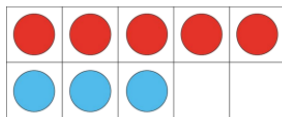


Missing addend equations:

$\square + 10 = 15$ $19 = 10 + \square$
 $\square + 3 = 13$ $11 = 1 + \square$

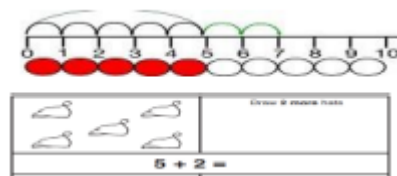
Represent and use number bonds and related subtraction facts within 20.

2 more than 5



Using tens frames to apply children's knowledge of $5 + 3 = 8$ and $3 + 5 = 8$ then applying it to subtraction facts: $8 - 5 = 3$ and $8 - 3 = 5$

'There are nine children. Eight of them are reading. How many of them are not reading?'

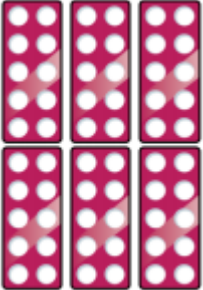






Using pictorial images and applying them to the part part whole model.

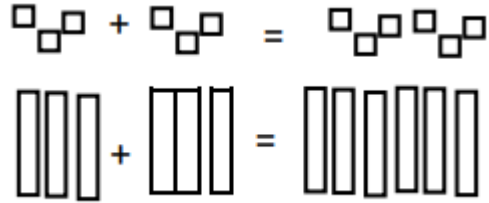
Using number lines and beads.

Emphasis should be on language:

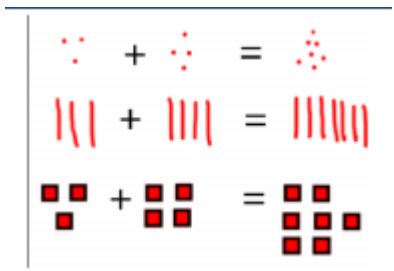
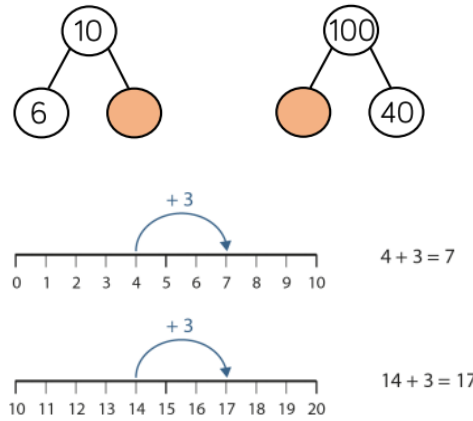
$8 - 5 = \square$ '8 is 3 more than 5'
 $\square + 6 = 9$ '3 more than 6 is 9'
 $6 + 3 = \square$ '3 is less than 4, so 6 plus 3 is 1 less than 10'

Objective and Strategy	Concrete	Pictorial	Abstract
<p>Adding multiples of ten.</p>	<p>Using numicon to represent 10.</p>  <p>$60 = 10 + 10 + 10 + 10 + 10 + 10$</p> <p>$50 = 30 + 20$</p>  <p>Model using dienes and bead strings</p>	 <p>3 tens + 5 tens = _____ tens</p> <p>$30 + 50 = \underline{\quad}$</p> <p>Use representations for base ten.</p>	<p>$20 + 30 = 50$</p> <p>$70 = 50 + 20$</p> <p>$40 + \square = 60$</p>
<p>Use known number facts.</p> <p>Part part whole</p>	 <p>Children explore ways of making numbers within 20.</p>	 <p>$\square + \square = 20$ $20 - \square = \square$</p> <p>$\square + \square = 20$ $20 - \square = \square$</p>	<p>$\square + 1 = 16$ $16 - 1 = \square$</p> <p>$1 + \square = 16$ $16 - \square = 1$</p>

Using known facts.



Children explore ways of using known facts.



Children to draw representations of H, T and O.

$3 + 4 = 7$

leads to

$30 + 40 = 70$

leads to

$300 + 400 = 700$

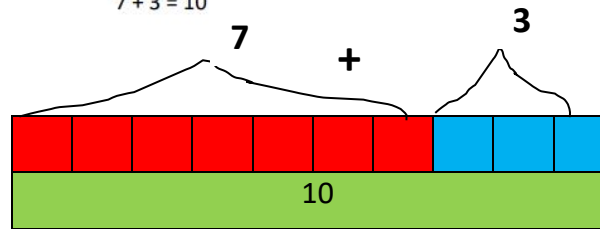
Bar model



$3 + 4 = 7$



$7 + 3 = 10$



27		12	15
15	?	?	

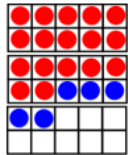
?	
15	?

$15 + 12 = 27$

Add a two-digit number and ones.



Continue to develop understanding of partitioning and place value.



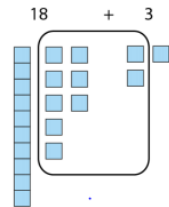
$17 + 5 = 22$

Use ten frame to make 'magic ten'

Children explore the pattern.

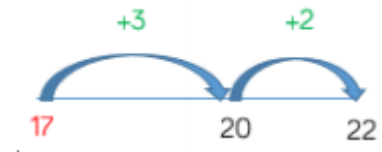
$17 + 5 = 22$

$27 + 5 = 32$

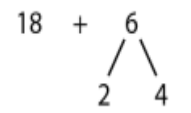


$18 + 3 = 18 + 2 + 1 = 20 + 1 = 21$

Using dienes, part whole and number lines to model.



$18 + 6 = \square$

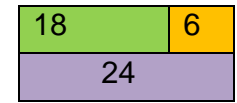


Explore related facts:

$6 + \square = 24$

$24 - 6 = \square$

$\square - 18 = 6$



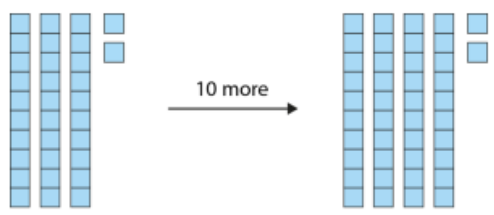
Add a two-digit number and tens.



$25 + 10 = 35$

Explore that the ones digit does not change

Using the dienes frames:

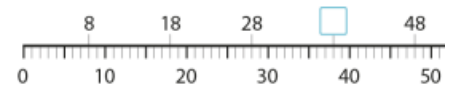


$32 \rightarrow 42$
 'We had three tens and two ones. Ten more gives us four tens and two ones.'

Using number squares to 100:

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

'Ten more than forty-two is fifty-two'.

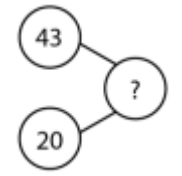


28	38	48					
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$23 + 10 = \square$

$33 + \square = 43$

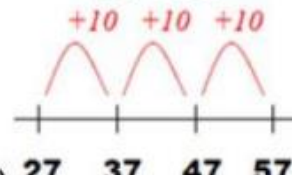

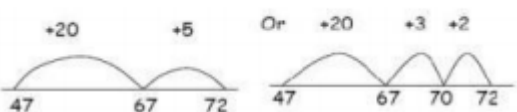
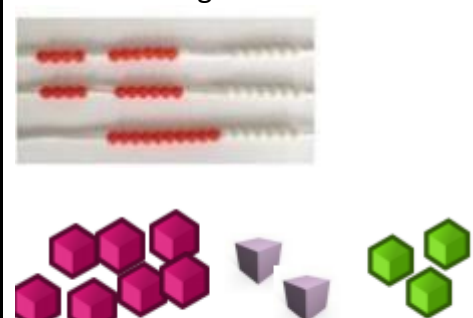
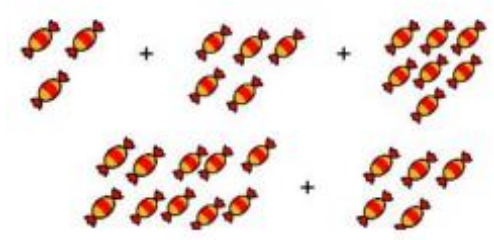
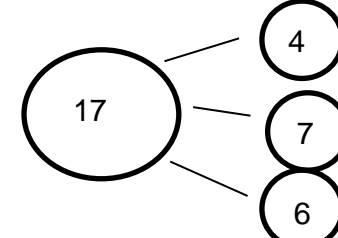
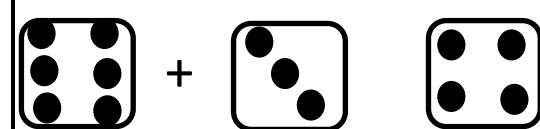
$\square + 10 = 53$



$27 + 10 = 37$

$27 + 20 = 47$

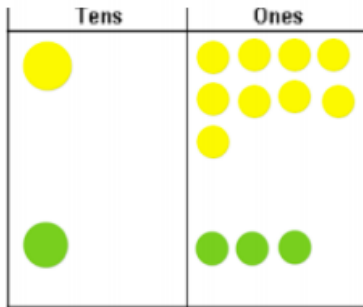
$27 + \square = 57$

		<p>Using number lines:</p> $27 + 30$  <p>27 37 47 57</p>																	
<p>Add two 2-digit numbers</p>	 <p>Model using dienes, place value counters and numicon</p>	 <p>Use number line and bridge ten using part whole if necessary.</p>	$\begin{array}{r} 45 \\ 40 \end{array} + \begin{array}{r} 23 \\ 20 \end{array}$ $40 + 20 = 60$ $5 + 3 = 8$ $60 + 8 = 68$																
<p>Adding 3 single digit numbers.</p>	<p>$4 + 7 + 6 = 17$</p> <p>Put 4 and 6 together to make 10. Add on 7.</p>  <p>Combine to make 10 first if possible, or bridge 10 then add third digit</p>	<p>Add together three groups of objects. Draw a picture to recombine the groups to make 10.</p> 	 <p>Combining the 4 + 6 to make 10, then adding the 7.</p>  <table border="1" data-bbox="1545 1197 1747 1388"> <tr> <td>5</td> <td>4</td> <td>2</td> <td><input type="text"/></td> </tr> <tr> <td>3</td> <td>7</td> <td>8</td> <td><input type="text"/></td> </tr> <tr> <td>5</td> <td>7</td> <td>3</td> <td><input type="text"/></td> </tr> <tr> <td><input type="text"/></td> <td><input type="text"/></td> <td><input type="text"/></td> <td><input type="text"/></td> </tr> </table>	5	4	2	<input type="text"/>	3	7	8	<input type="text"/>	5	7	3	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
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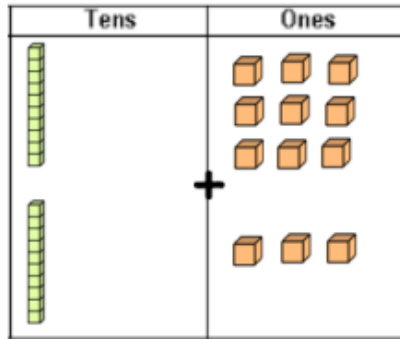
Addition

Year 2

To begin with column addition – no grouping then beginning to group ones and tens.



Use place value counters and ones to provide support.



$$\begin{array}{r} 45 \\ 40 \quad 5 \\ + \quad 23 \\ 20 \quad 3 \end{array}$$

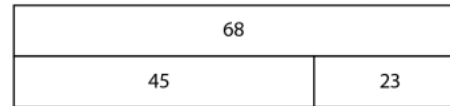
'First I partition the forty-five into forty and five, twenty-three into twenty and three.'

$40+20=60$
'Forty plus twenty is equal to sixty.'

$5+3=8$
'...five plus three is equal to eight.'

$60+8=68$
'...and sixty plus eight is equal to sixty-eight.'

$45+23=68$
'So forty-five plus twenty-three is equal to sixty-eight.'



Using a bar model to represent the calculation.

Expanded method:

$$\begin{array}{r} 19 \\ +13 \\ \hline 12 \\ +20 \\ \hline 32 \end{array}$$

With renaming:

$$\begin{array}{r} 19 \\ +13 \\ \hline 32 \\ 1 \end{array}$$

Without renaming:

$$\begin{array}{r} 18 \\ +11 \\ \hline 29 \end{array}$$

Start with using the expanded method, then move onto adding without exchanging ones and tens. Next, move onto exchanging with tens and ones.


Objective and Strategy

Column Addition – no grouping (friendly numbers)

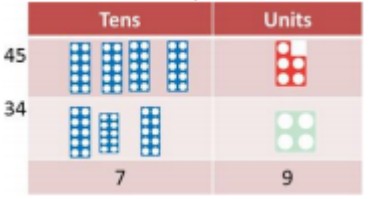
Add two or three 2 or 3 digit numbers.

Concrete

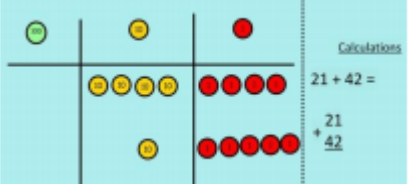
Dienes:



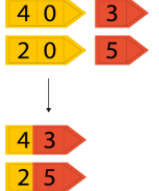
Model using Dienes or Numicon.



Add together the ones first, then the tens.

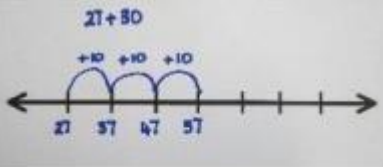


Move to using place value counters.

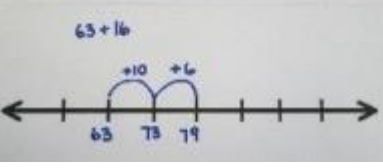
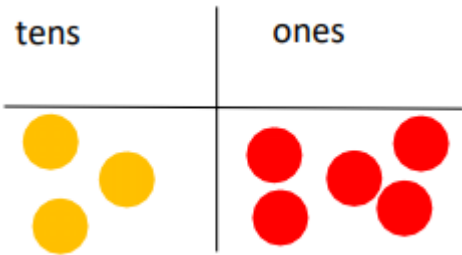


This also can be supported using arrow cards.

Pictorial



Using number lines.

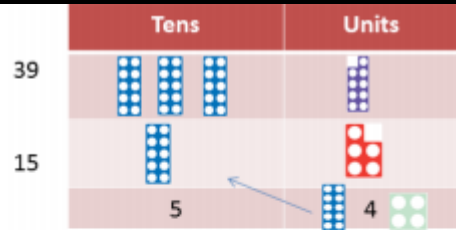
Children move to drawing the counters using a tens and one frame.

Abstract

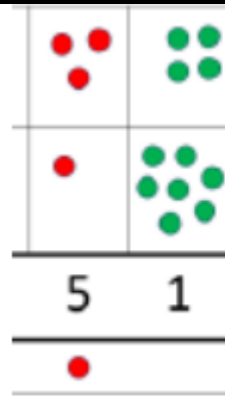
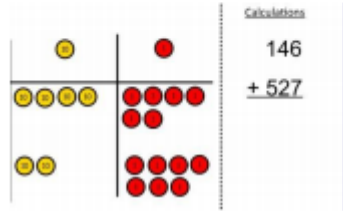
$$\begin{array}{r}
 223 \\
 + 114 \\
 \hline
 337
 \end{array}$$

Add the ones first, then the tens, then the hundreds.

Column Addition with regrouping.



Exchange ten ones for a ten. Model using numicon and pv counters.



Children can draw a representation of the grid to further support their understanding, carrying the ten underneath the line

$$87 + 56 = 130$$

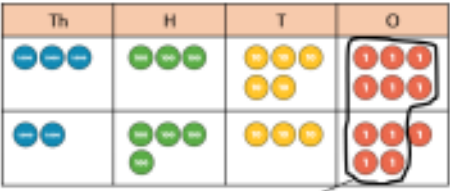
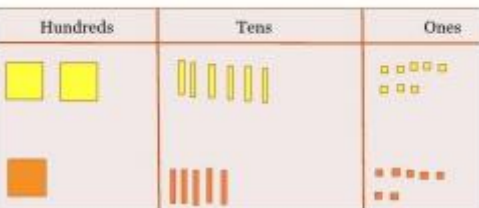
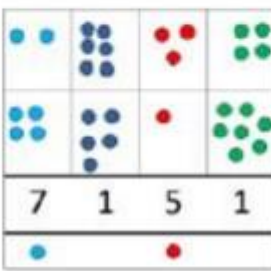
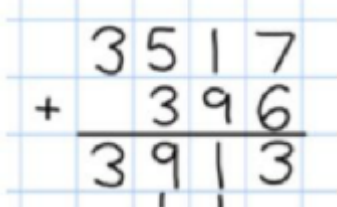
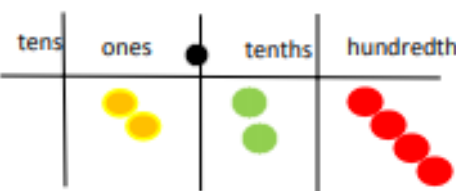
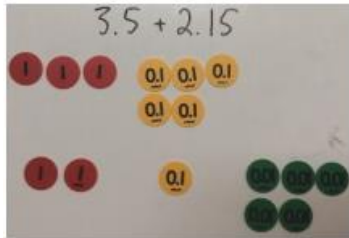
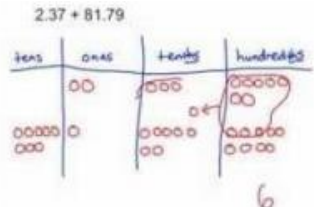
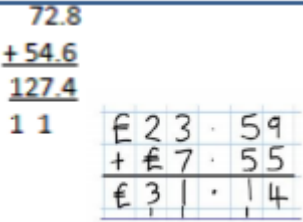
$$\begin{array}{r} 87 \\ 80 \quad 7 \end{array} + \begin{array}{r} 56 \\ 50 \quad 6 \end{array} = 130 + 13 = 143$$

$$80 + 7$$

$$50 + 6$$

$$130 + 13 = 143$$

$$\begin{array}{r} 87 \\ + 56 \\ \hline 143 \\ \hline 11 \end{array}$$

Objective and Strategy	Concrete	Pictorial	Abstract
<p>Y4 – add numbers with up to 4 digits</p>	<p>Children use base ten blocks to find the total.</p>  <p>3,356 + 2,435</p> <p>Children continue to use dienes or pv counters to add, exchanging ten ones for a ten and ten tens for a hundred and ten hundreds for a thousand.</p> 	<p>Children can draw a pictorial representation of the columns and place value counters to further support their learning and understanding.</p> 	 <p>Continue from previous work to carry hundreds as well as tens.</p> <p>Relate to money and measures.</p>
<p>Y5 – add numbers with more than 4 digits.</p> <p>Add decimals with 2 decimal places, including money.</p>	<p>As year 4</p>  <p>Introduce decimal place value counters and model exchange for addition.</p>	 	

Addition

Year 4-6

Y6 – add several numbers of increasing complexity.

Including adding money, measure and decimals with different numbers of decimal points.

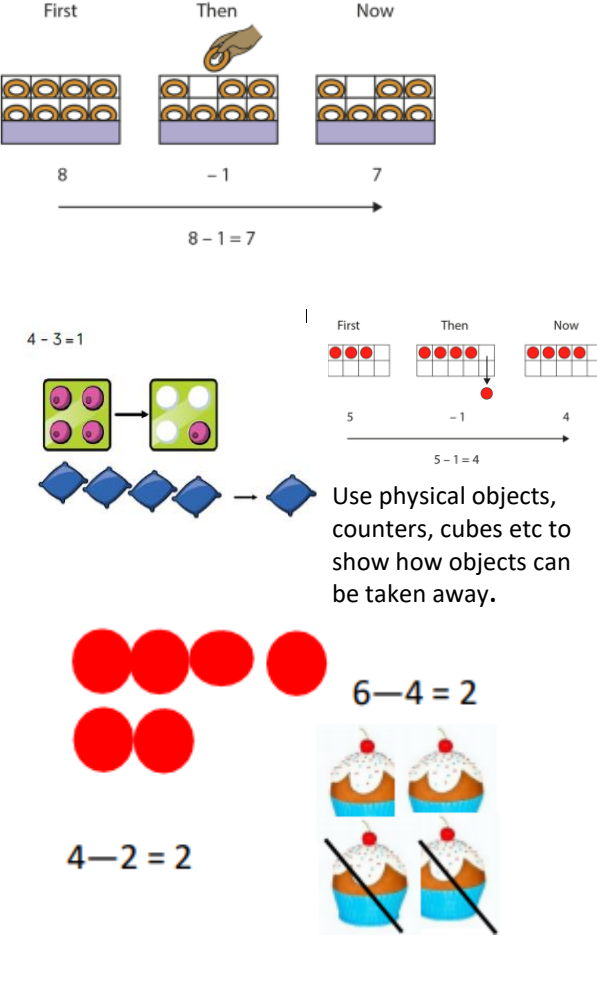
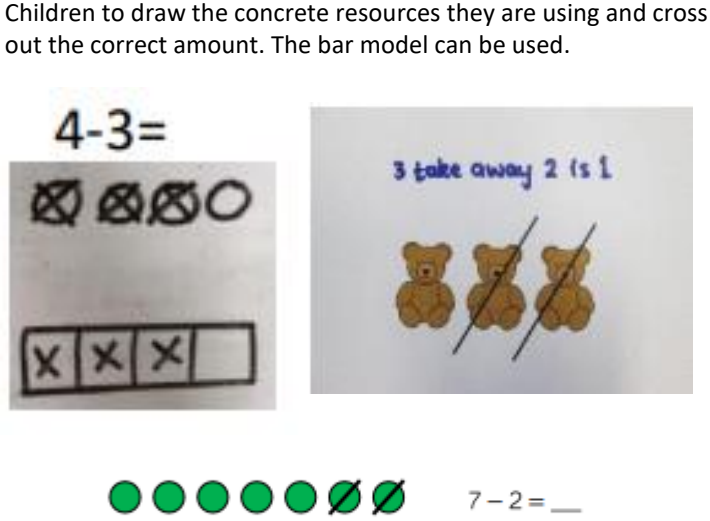
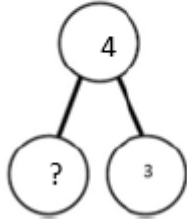
AS Y5

As Y5

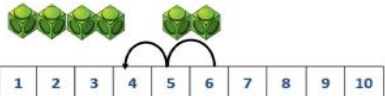
$$\begin{array}{r} 81,059 \\ 3,668 \\ 15,301 \\ + 20,551 \\ \hline 120,579 \\ \small 1 \quad 1 \quad 1 \quad 1 \end{array}$$

Insert zeros for place holders.

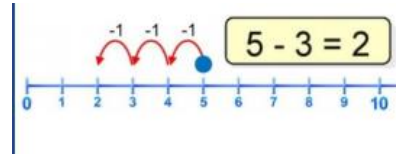
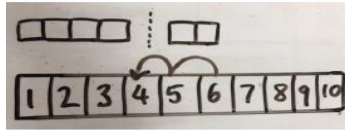
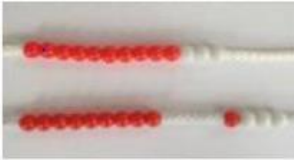
$$\begin{array}{r} 23.361 \\ 9.080 \\ 59.770 \\ + 1.300 \\ \hline 93.511 \end{array}$$

Objective and Strategy	Concrete	Pictorial	Abstract				
<p>Taking away ones.</p>	<p>First Then Now</p>  <p>Use physical objects, counters, cubes etc to show how objects can be taken away.</p>	<p>Children to draw the concrete resources they are using and cross out the correct amount. The bar model can be used.</p> 	<p>10 - 1 = <input type="text"/> 5 - 1 = <input type="text"/></p> <p>9 - 1 = <input type="text"/> 4 - 1 = <input type="text"/></p> <p>8 - 1 = <input type="text"/> 3 - 1 = <input type="text"/></p> <p>7 - 1 = <input type="text"/> 2 - 1 = <input type="text"/></p> <p>6 - 1 = <input type="text"/> 1 - 1 = <input type="text"/></p> <p>4 - 3 =</p> <p><input type="text"/> = 4 - 3</p> <table border="1" data-bbox="1659 746 1966 821"> <tr> <td colspan="2">4</td> </tr> <tr> <td>3</td> <td>?</td> </tr> </table> 	4		3	?
4							
3	?						
<p>Counting back.</p>	<p>Using number lines or tracks. Make the large number. Move the beads along the bead string as you count backwards in ones.</p>	<p>Count back in ones using a number line to represent what they see pictorially.</p>	<p>Put 13 in your head, count back 4. What number are you at? Use your fingers to help.</p>				

$6 - 2 = 4$



$13 - 4 =$

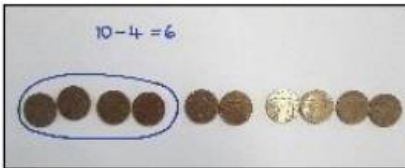


Find the difference

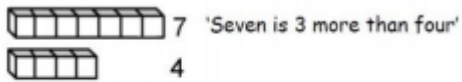
What's the difference between 10 and 6? 

The difference between 10 and 6 is 

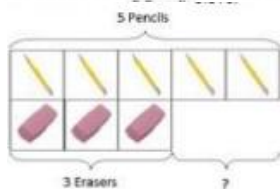
$10 - 6 =$



Compare amounts and objects to find the difference.



'I am 2 years older than my sister'



Lay objects to represent bar model.

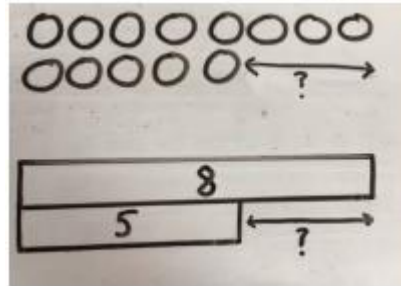
How many more cakes does Whitney have than Teddy?



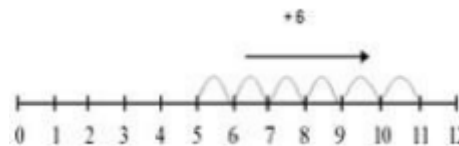
Whitney has more cakes than Teddy.

Use cubes, basic bar models, counters and other items to find the difference.

Draw the cubes or other resources used or use the bar model to illustrate what they need to calculate.



Count on using a number line to find the difference.



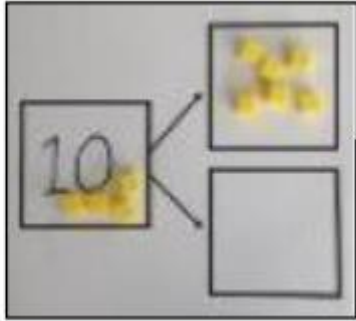
Find the difference between 8 and 5.
 $8 - 5$, the difference is

Children to explore why $9 - 6 = 7 - 4$ have the same difference.

Hannah has 23 sandwiches; Helen has 15 sandwiches. Find the difference between the number of sandwiches

Represent and use number bonds and related subtraction facts within 20.
Part Part Whole model

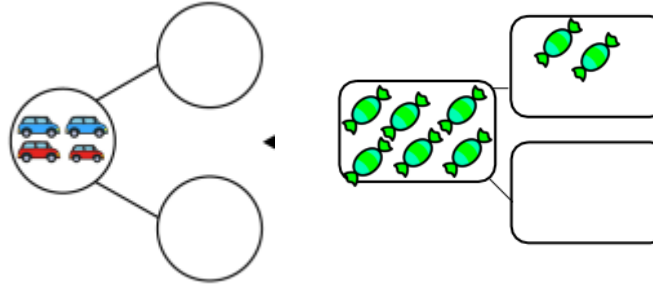
Link to addition – use the part whole model to help explain the inverse between addition and subtraction,



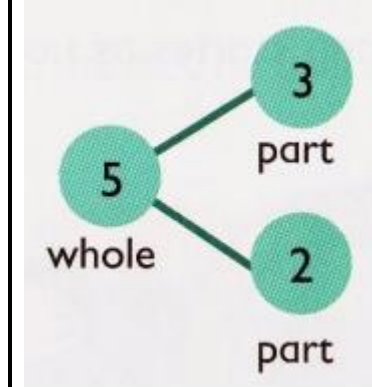
If 10 is the whole and 6 is one of the parts. What is the other part?

$10 - 6 = \square$

Use a pictorial representation of objects to show the part – part – whole model. Any objects can be used for this.

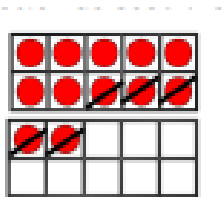


Move to using numbers within the part-part-whole model.



Make 10

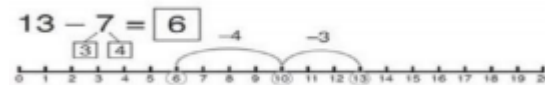
12 – 5
Make 12 on the ten frame. Take 2 away to make ten, then take 3 more away to make 7.



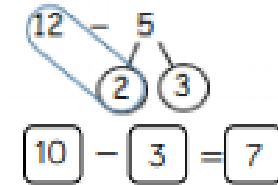
Children represent the ten frame pictorially and discuss what they did to make 10.



Use number lines. Start at 13. Take away 3 to reach 10. Then take away the remaining 4 so you have taken 7 altogether. You have reached your answer.



Children to demonstrate how they can make 10 by partitioning the subtrahend.



16 – 7

How many do we take off first to get to 10?
How many left to take off?

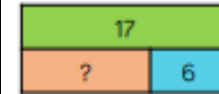
Subtraction

Year 1

Bar Model



$$5 - 2 = 3$$

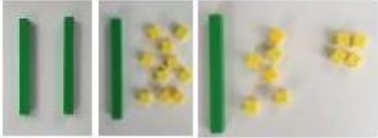
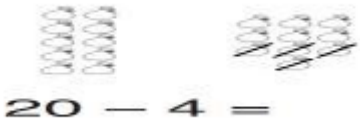





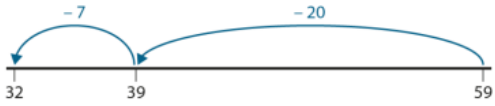





$$17 - \square = 6$$

$$17 - \square = 11$$

$$17 = \square + 6$$

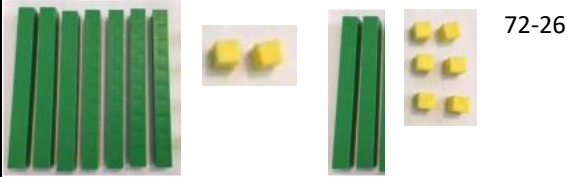
$$17 = 11 + \square$$

Objective and Strategy	Concrete	Pictorial	Abstract																		
<p>Regroup a ten into ten ones</p>	 <p>Use a PV chart to show how to change a ten into ten ones, use the term 'take and make'</p>	 <p>$20 - 4 =$</p>	<p>$20 - 4 = 16$</p>																		
<p>Partitioning to subtract without regrouping</p> <p>'friendly numbers'</p>	<p>78 minus 34 = ____</p> <p>8 ones - 4 ones = ____</p> <p>7 tens - 3 tens = ____</p> <p>We have ____ tens and ____ ones.</p> <table border="1" data-bbox="654 512 842 635"> <thead> <tr> <th>Tens</th> <th>Ones</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> </tr> <tr> <td> </td> <td> </td> </tr> </tbody> </table> <p>Use Dienes to show how to partition the number when subtracting without regrouping.</p> <p>$78 - 34 =$</p>  <p>Take three tens and four ones away</p>	Tens	Ones					<p>Using number lines and part-part whole model</p>  <p>Part-part-whole diagram:</p> <table border="1" data-bbox="927 695 1391 802"> <tr> <td colspan="2">59</td> </tr> <tr> <td>27</td> <td>?</td> </tr> </table> <p>$59 - 27 =$ ____</p> <table data-bbox="1111 890 1234 1018"> <tr> <td>59</td> <td></td> </tr> <tr> <td>50</td> <td>9</td> </tr> <tr> <td>-20</td> <td>-7</td> </tr> <tr> <td>30</td> <td>2</td> </tr> </table> <p>Partition the number 59 Partition 27 and subtract the ones and the tens. Place the partitioned number back together.</p> <p>Children draw representations of Dienes and cross off.</p>  <p>$43 - 21 = 22$</p>	59		27	?	59		50	9	-20	-7	30	2	<p>$59 - 27 = 32$</p>
Tens	Ones																				
																					
59																					
27	?																				
59																					
50	9																				
-20	-7																				
30	2																				

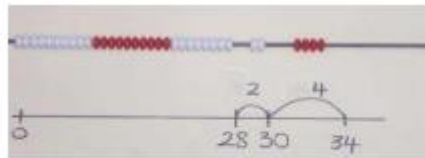
Subtraction

Year 2

Make ten strategy

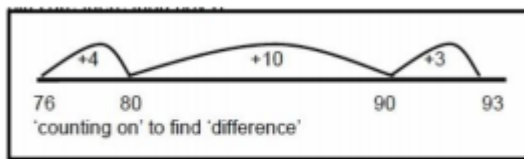


Use Dienes to model $72-2-20-4=46$



$34-28$

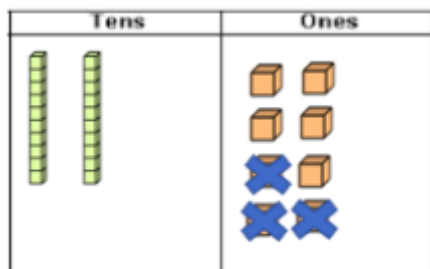
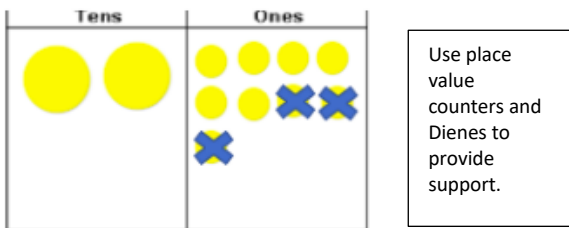
Use a bead bar or bead strings to model counting to next ten and the rest.



Use a number line to count on to next ten and then the rest.

$93-76=17$

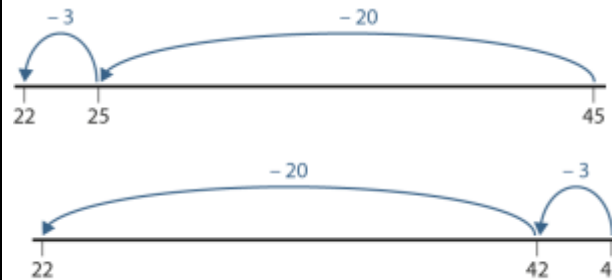
Beginning to use the column method to subtract



'To subtract twenty-three, we can subtract twenty and then subtract three.'

$$45 - 23 = 45 - 20 - 3$$

Use partitioning to aid subtracting and number lines.



Expanded method:

$$\begin{array}{r} 29 \\ -14 \\ \hline 5 \\ \underline{10} \\ 15 \end{array}$$



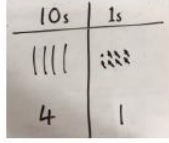
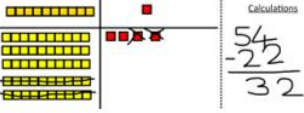
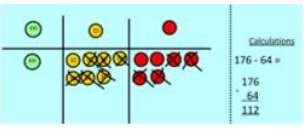
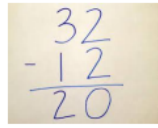
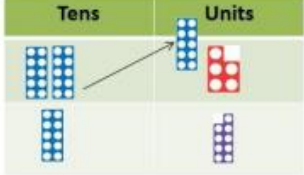
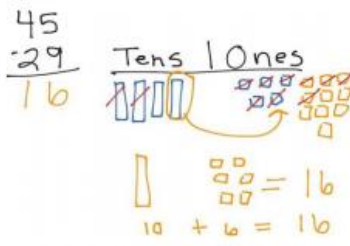


Without renaming:

$$\begin{array}{r} 28 \\ - 3 \\ \hline 25 \end{array}$$

With renaming:

$$\begin{array}{r} 1 \quad 13 \\ \cancel{2} \quad \cancel{9} \\ - 19 \\ \hline 4 \end{array}$$

Start with using the expanded method, then move onto adding without exchanging ones and tens. Next, move onto exchanging with tens and ones.

Objective and Strategy	Concrete	Pictorial	Abstract																
<p>Column subtraction without regrouping (friendly numbers)</p>	<p>Use base 10 or Numicon to model.</p>  <p>$47 - 32$</p>  <p>$35 - 14 = 21$</p> <table border="1" data-bbox="295 531 739 667"> <tr> <td>T</td> <td>U</td> <td>T</td> <td>U</td> </tr> <tr> <td>10</td> <td>1 1 1</td> <td>30</td> <td>5</td> </tr> <tr> <td>10</td> <td>1 1</td> <td>10</td> <td>4</td> </tr> <tr> <td></td> <td></td> <td>20</td> <td>1</td> </tr> </table> <p>Use place value counters model how to partition numbers to subtract.</p>	T	U	T	U	10	1 1 1	30	5	10	1 1	10	4			20	1	<p>Represent method pictorially.</p>   <p>Calculations</p> $\begin{array}{r} 54 \\ - 22 \\ \hline 32 \end{array}$  <p>Calculations</p> $\begin{array}{r} 176 - 64 = \\ 176 \\ - 64 \\ \hline 112 \end{array}$	<p>Intermediate step may be needed to lead to clear subtraction understanding.</p> $47 - 24 = 23$ $\begin{array}{r} 40 + 7 \\ - 20 + 4 \\ \hline 20 + 3 \end{array}$ 
T	U	T	U																
10	1 1 1	30	5																
10	1 1	10	4																
		20	1																
<p>Column subtraction with regrouping</p>	<p>Begin with base 10 or Numicon. Move to pv counters, modelling the exchange of a ten into ten ones. Use the phrase 'take and make' for exchange.</p> 	<p>Children may draw base ten or PV counters and cross off.</p> 	<p>Begin by partitioning into pv columns</p>  <p>Then move to formal method.</p> 																

Objective and Strategy	Concrete	Pictorial	Abstract																												
<p>Subtracting tens and ones.</p> <p>Year 4 subtract with up to 4 digits.</p> <p><i>Introduce decimal subtraction through context of money.</i></p>	<div style="display: flex; align-items: center;"> <div style="margin-right: 20px;"> $\begin{array}{r} 443 \\ -218 \\ \hline 225 \end{array}$ </div> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr> <th>hundreds</th> <th>tens</th> <th>ones</th> </tr> <tr> <td>●●●</td> <td>●●●</td> <td>●●●</td> </tr> <tr> <td>●●●</td> <td>●●●</td> <td>●●●</td> </tr> <tr> <td>●●●</td> <td>●●●</td> <td>●●●</td> </tr> </table> </div> <p style="text-align: center;">$443 - 218 = 225$</p> <p>Model the process of exchanging using numicon, base ten and place value counters.</p>	hundreds	tens	ones	●●●	●●●	●●●	●●●	●●●	●●●	●●●	●●●	●●●	<p>Draw the counters onto a place value grid and show what you have subtracted by crossing out the counters, as well as clearly showing the exchanges you make.</p>	<p>Use the phrase 'take and make' for exchange.</p>																
hundreds	tens	ones																													
●●●	●●●	●●●																													
●●●	●●●	●●●																													
●●●	●●●	●●●																													
<p>Year 5 – subtract with at least 4 digits, including money and measures.</p> <p><i>Subtract with decimal values, including mixtures of integers and decimals and aligning the decimal.</i></p>	<p style="text-align: center;">$4,648 - 2,347$</p> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr> <th>1,000s</th> <th>100s</th> <th>10s</th> <th>1s</th> </tr> <tr> <td>●●●</td> <td>●●●</td> <td>●●●</td> <td>●●●</td> </tr> <tr> <td>●●●</td> <td>●●●</td> <td>●●●</td> <td>●●●</td> </tr> <tr> <td>●●●</td> <td>●●●</td> <td>●●●</td> <td>●●●</td> </tr> </table> <p>Follow through with Year 4, using base 10, numicon and place value counters.</p> <div style="display: flex; align-items: center;"> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr> <th>Ones</th> <th>Tenths</th> <th>Hundredths</th> </tr> <tr> <td>●●●</td> <td>●●●</td> <td>●●●</td> </tr> <tr> <td>●●●</td> <td>●●●</td> <td>●●●</td> </tr> <tr> <td>●●●</td> <td>●●●</td> <td>●●●</td> </tr> </table> <div style="margin-left: 20px;">4.54-1.4</div> </div>	1,000s	100s	10s	1s	●●●	●●●	●●●	●●●	●●●	●●●	●●●	●●●	●●●	●●●	●●●	●●●	Ones	Tenths	Hundredths	●●●	●●●	●●●	●●●	●●●	●●●	●●●	●●●	●●●	<p>Continue to draw the counters onto a place value grid and show what you have subtracted by crossing out the counters, as well as clearly showing the exchanges you make.</p>	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin-left: 10px;"> Demonstrate the 0 as a place holder. </div>
1,000s	100s	10s	1s																												
●●●	●●●	●●●	●●●																												
●●●	●●●	●●●	●●●																												
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Ones	Tenths	Hundredths																													
●●●	●●●	●●●																													
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Subtraction

Year 4-6

Year 6 – subtract with increasingly large and more complex numbers and decimal values

Continue to use place value counters, numicon, base ten where appropriate.

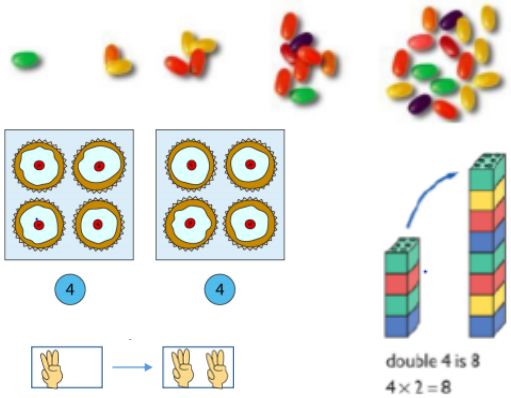
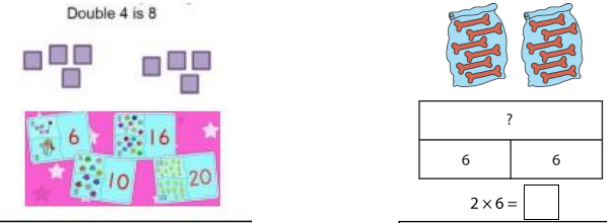
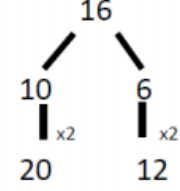
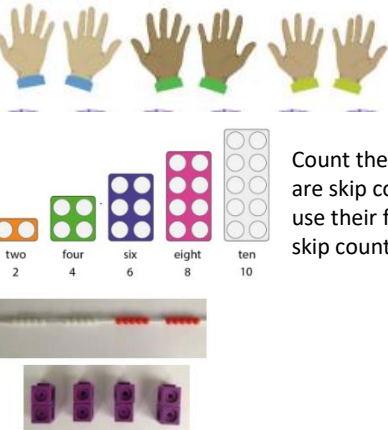
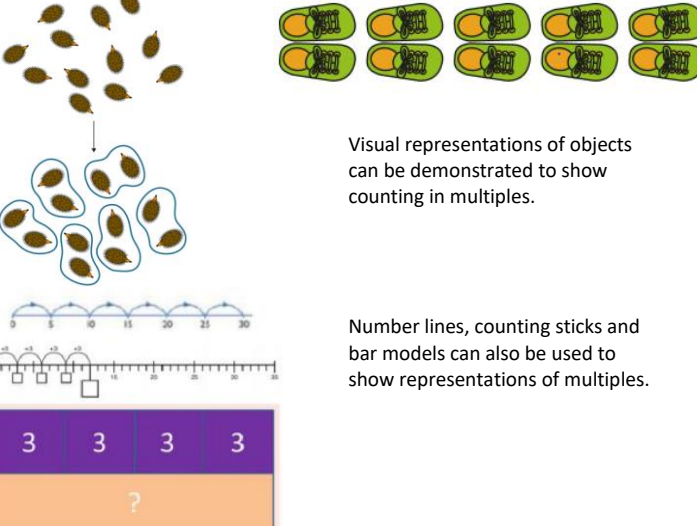
$$\begin{array}{r} 2 \quad 9 \quad 1 \quad 1 \\ \cancel{3} \quad \cancel{0} \quad \cancel{3} \quad 1 \quad . \quad 8 \\ - 1 \quad 8 \quad 6 \quad 7 \quad . \quad 3 \\ \hline 1 \quad 1 \quad 6 \quad 4 \quad . \quad 5 \end{array}$$

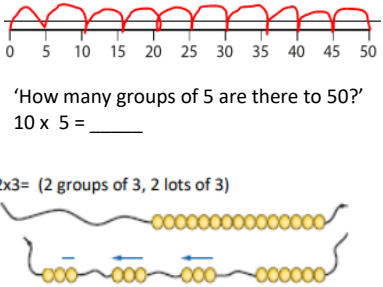

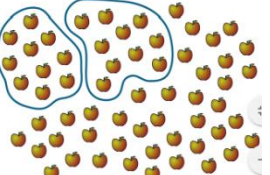
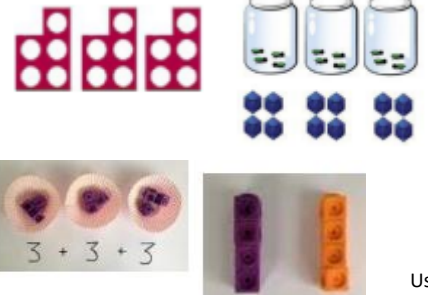

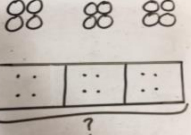

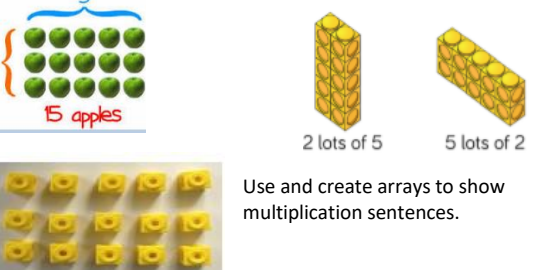
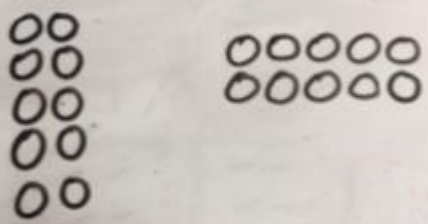
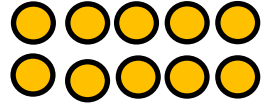
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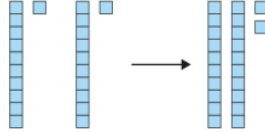
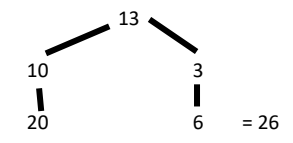
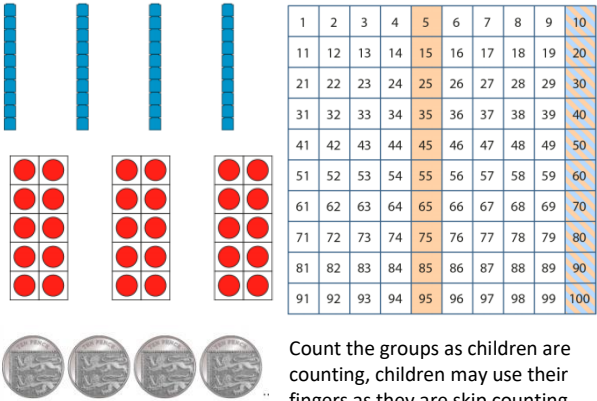
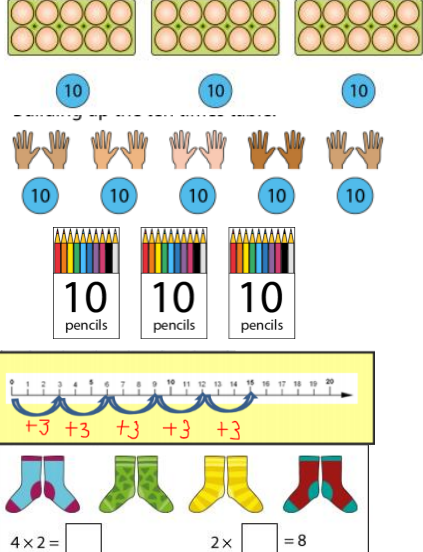
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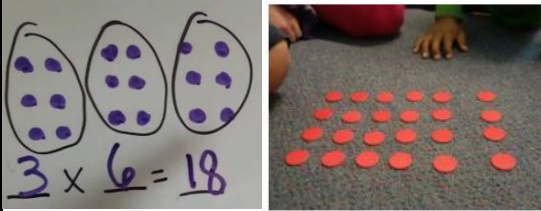
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1	1	6	4	.	5				

Objective and Strategy	Concrete	Pictorial	Abstract
<p>Doubling</p>	 <p>Using a range of practical activities and equipment to demonstrate doubling.</p>	<p>Draw pictures to demonstrate how to double numbers.</p>  <p>Bar models can be used to demonstrate doubling.</p>	 <p>Partition a number and then double each part before recombining it back together.</p>
<p>Counting in multiples</p>	 <p>Count the groups as children are skip counting. Children may use their fingers as they are skip counting.</p>	 <p>Visual representations of objects can be demonstrated to show counting in multiples.</p> <p>Number lines, counting sticks and bar models can also be used to show representations of multiples.</p>	<p>Count in multiples of a number aloud.</p> <p>Write sequences of numbers.</p> <p>2, 4, 6, 8, 10 5, 10, 15, 20, 25, 30</p> <p>$2 \times 3 = \square$</p>

<p>Making equal groups and counting the total</p>	 <p>'How many groups of 5 are there to 50?' $10 \times 5 = \underline{\quad}$</p> <p>$2 \times 3 =$ (2 groups of 3, 2 lots of 3)</p> <p>Children to use beads, number lines and counting sticks to create equal groups.</p>	<p>Complete the sentences</p>  <p>There are <u> </u> groups of <u> </u> pencils. There are <u> </u> groups of <u> </u> flowers.</p>  <p>Children to split objects into different groups.</p> <p>How many groups of 10 are there? What is the total amount?</p> <p>$6 \times 10 = \underline{\quad}$</p>	<p>$2 \times 6 = 12$</p>
<p>Repeated addition</p>	 <p>$3 + 3 + 3$</p> <p>Use different groups to add equal groups</p>	 <p>$5 + 5 + 5 = 15$</p> <p>There are 3 plates. Each plate has 2 star biscuits on. How many biscuits are there?</p> <p>use pictorial including number lines to solve.</p> <p>$2 \text{ add } 2 \text{ add } 2 \text{ equals } 6$</p>  <p>using bar models to represent repeated addition.</p>	 <p>$2 + 2 + 2 + 2 + 2 = 10$</p> <p>Write addition sentences to describe objects and pictures</p>
<p>Understanding arrays</p>	 <p>15 apples</p> <p>2 lots of 5 5 lots of 2</p> <p>Use and create arrays to show multiplication sentences.</p>	 <p>Children to draw the arrays pictorially.</p>	<p>Using arrays to write multiplication sentences.</p>  <p>$5 + 5 = 10$ $2 + 2 + 2 + 2 + 2 = 10$ $2 \times 5 = 10$ $5 \times 2 = 10$</p>

Objective and Strategy	Concrete	Pictorial	Abstract										
<p>Doubling</p>	 <p>double 11 = double 10 + double 1 = 20 + 2 = 22</p> <p>Model doubling using Dienes and place value counters.</p>	<p>Draw pictures and representations to show how to double numbers.</p>	<p>Partition a number and then double each part before recombining it back together.</p> <p><i>There are thirteen pairs of socks. How many socks are there altogether?</i></p>  <p>$13 \times 2 = \square$</p>										
<p>Counting in multiples of 2, 3, 4, 5, 10 from 0.</p> <p>(repeated addition)</p>	 <p>Count the groups as children are counting, children may use their fingers as they are skip counting.</p> <p>Use a range of resources to demonstrate this.</p>	 <p>Number lines, counting sticks and bar modes to show representation of counting in multiples.</p> <p>$4 \times 2 = \square$ $2 \times \square = 8$</p>	<p>Counting in multiples of a number aloud.</p> <p>Write in sequences with multiples of numbers.</p> <p><i>Fill in the missing numbers.</i></p> <table border="1" data-bbox="1668 726 2072 766"> <tr> <td>0</td> <td>10</td> <td>20</td> <td>30</td> <td>40</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> <p>$3 \times 4 = \square$</p>	0	10	20	30	40					
0	10	20	30	40									

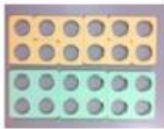
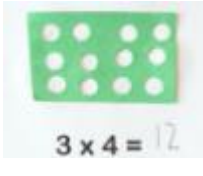
Multiplication is commutative



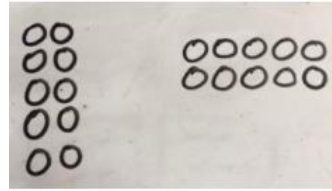
3 lots of 4
4 lots of 3



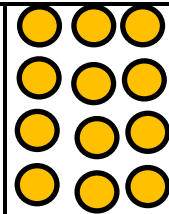
Children to create arrays using a range of equipment: counters, cubes and Numicon.



Pupils should understand that an can represent different equations and that, as multiplication is commutative, the order of multiplication does not affect the answer.



Children to represent the arrays pictorially.
Make sure the arrays are drawn in different orientations to find the commutativity.



Children to be able to use an array to write multiplication sentences and calculations

$$3 + 3 + 3 + 3 = 12$$

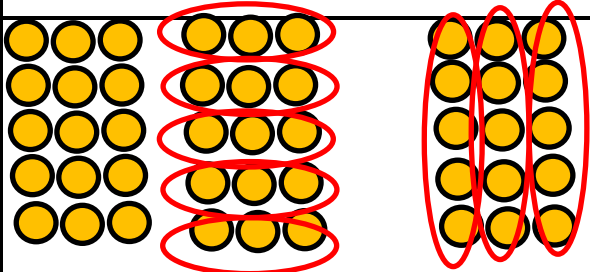
$$4 + 4 + 4 = 12$$

$$4 \times 3 = 12$$

$$3 \times 4 = 12$$

Using the inverse

This should be taught alongside division, so pupils learn how they work alongside each other.

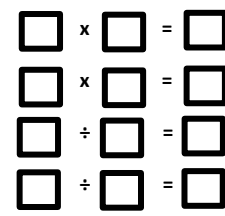
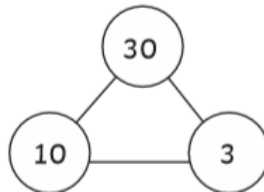


Children to use equipment to build an array.

Children to split the array into equal groups.

$$15 \div 5 = 3$$

$$15 \div 3 = 5$$



Using part part whole diagrams to make multiplication and division sentences.

Children to come up with 8 related fact family sentences.

$$3 \times 10 = 30$$

$$10 \times 3 = 30$$

$$30 = 10 \times 3$$

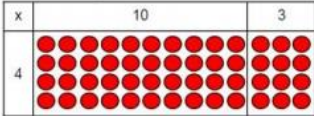
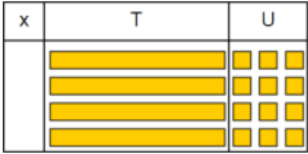

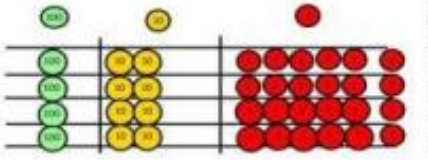
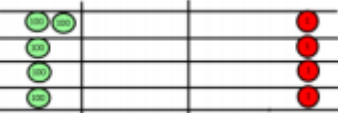
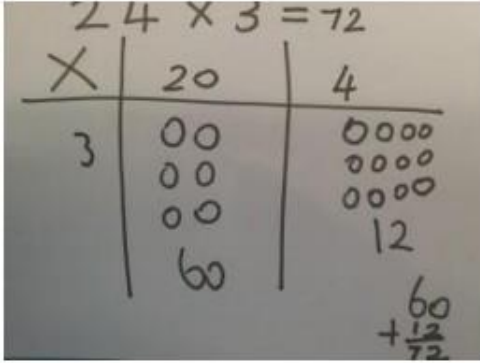
$$30 = 3 \times 10$$

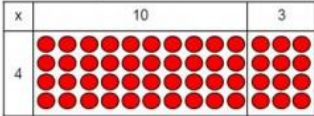
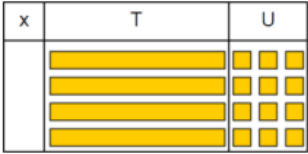
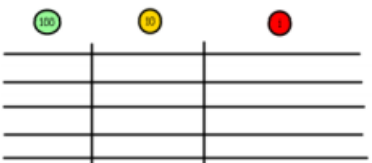
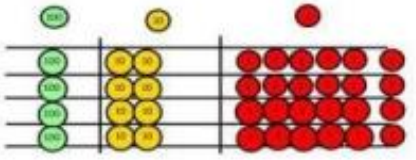
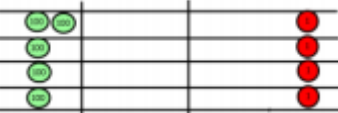
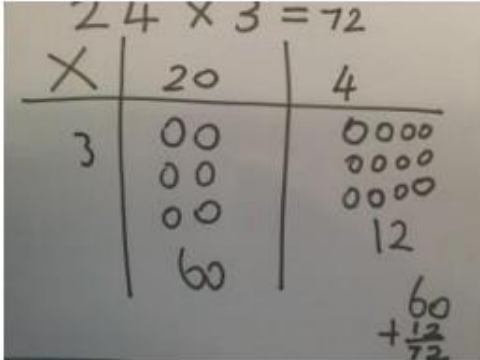
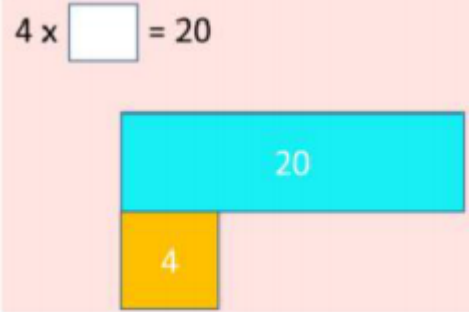
$$30 \div 3 = 10$$



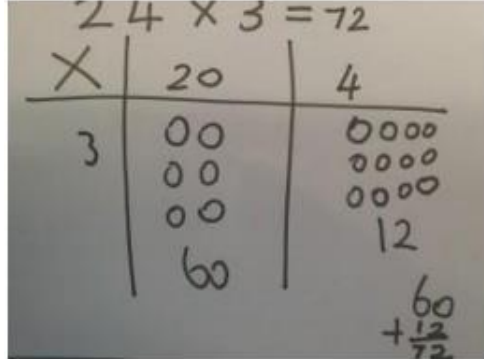
$$30 \div 10 = 3$$



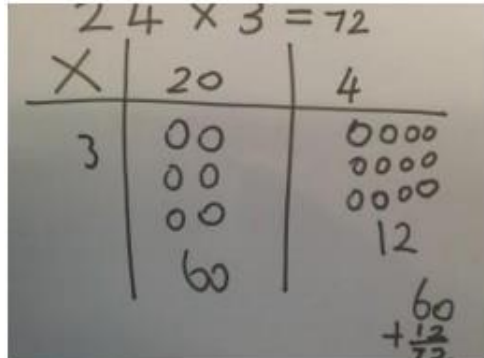
$$10 = 30 \div 3$$

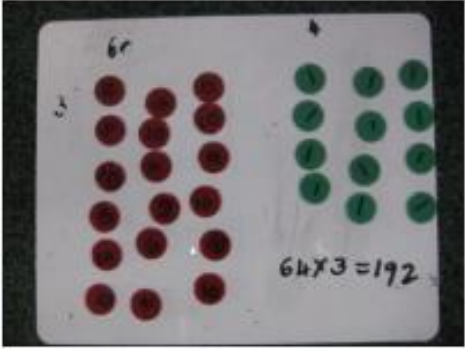
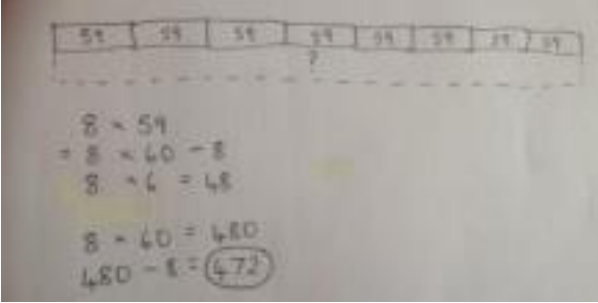
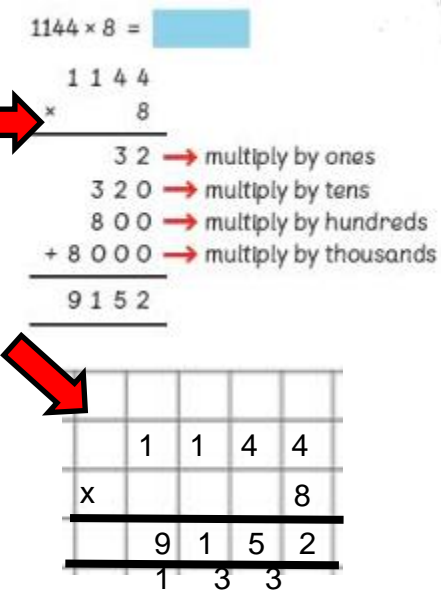
$$3 = 30 \div 10$$

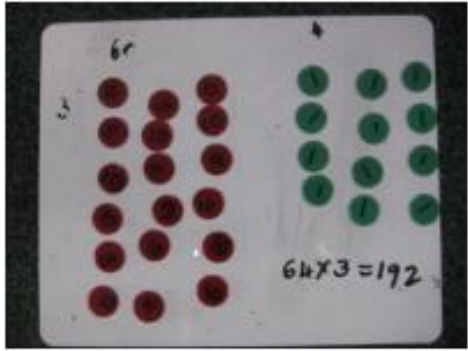

Objective and Strategy	Concrete	Pictorial	Abstract						
<p>Grid method</p>	<p>Show the link with arrays to first introduce the grid method.</p>  <p>4 rows of 10 4 rows of 3</p> <p>Move on to using Base 10 to move towards a more compacy method.</p>  <p>Move on to place value counters to show how we are finding groups of a number. We are multiplying by 4 so we need 4 rows.</p>  <p>Calculations 4×126</p> <p>Fill each row with 126</p>  <p>Calculations 4×126</p> <p>Add up each column starting with the ones making any exchanges needed. Then you have your answer.</p> 	<p>Children can represent the work they have done with place value counters in a way that they understand. They can draw the counters, using colours to show different amounts or just use circles in the different columns to show their thinking.</p> 	<p>Start with multiplying by one digit numbers and showing the clear addition alongside the grid.</p> <table border="1" data-bbox="1668 379 2056 497"> <tr> <td>x</td> <td>30</td> <td>5</td> </tr> <tr> <td>7</td> <td>210</td> <td>35</td> </tr> </table> <p>$210 + 35 = 245$</p>	x	30	5	7	210	35
x	30	5							
7	210	35							

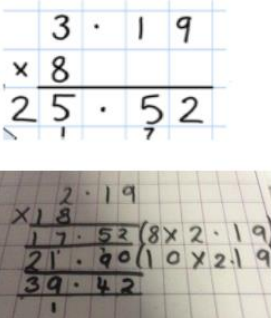
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7	210	35							

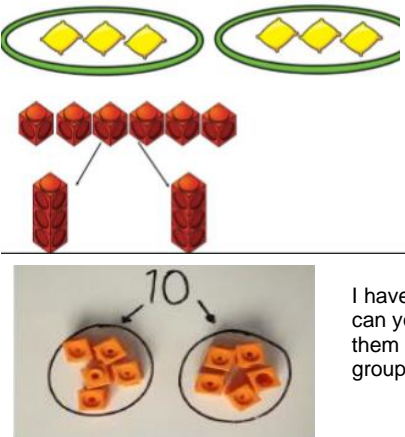
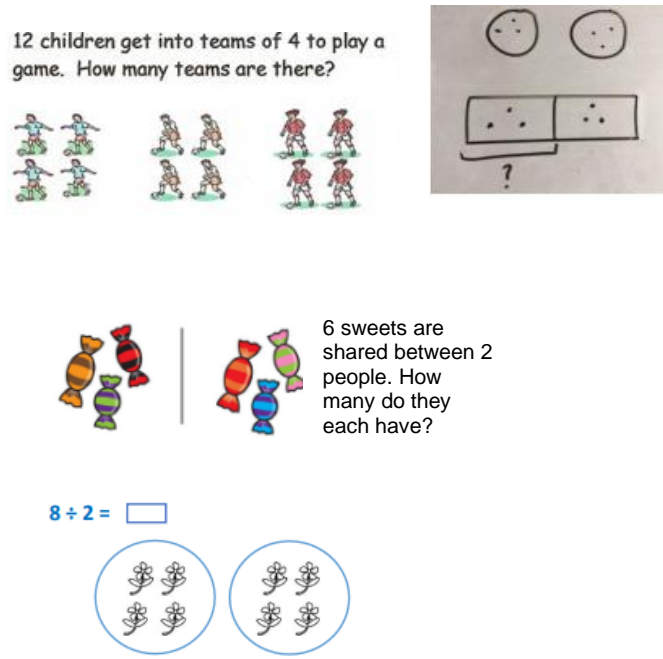
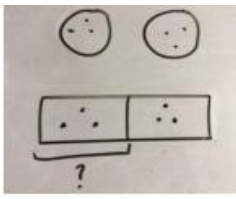
Objective and Strategy	Concrete	Pictorial	Abstract						
<p>Grid method recap from year 1 for 2 digits x 1 digit.</p> <p>Move to multiplying 3 digit numbers by 1 digit (Year 4 expectation)</p>	<p>Place-value counter representation of 521×3:</p> <p>Step 1 – partition 521: $521 = 500 + 20 + 1$ $521 = 5 \text{ hundreds} + 2 \text{ tens} + 1 \text{ one}$</p> <p>Steps 2 and 3 – gather three sets of 521, multiply the hundreds, tens and ones and recombine:</p>  <p>5 hundreds $\times 3 = 15$ hundreds 2 tens $\times 3 = 6$ tens 1 one $\times 3 = 3$ ones</p> <p>$521 \times 3 = 500 \times 3 + 20 \times 3 + 1 \times 3$ $= 1500 + 60 + 3$</p> <p>Step 4 - regroup the hundreds into thousands and hundreds</p> <p>15 hundreds = 1 thousand + 5 hundreds</p> <p>$521 \times 3 = 1000 + 500 + 60 + 3$ $= 1563$</p> 	<p>Children can represent the work they have done with place value counters in a way that they understand. They can draw the counters, using colours to show different amounts or just use circles in the different columns to show their thinking.</p> 	<p>Start with multiplying by one digit numbers and showing the clear addition alongside the grid.</p> <table border="1" data-bbox="1668 383 2049 494"> <tr> <td>x</td> <td>30</td> <td>5</td> </tr> <tr> <td>7</td> <td>210</td> <td>35</td> </tr> </table> <p>$210 + 35 = 245$</p>	x	30	5	7	210	35
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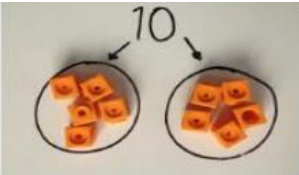
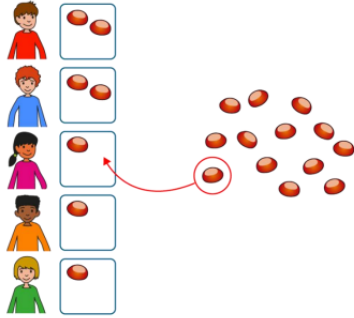
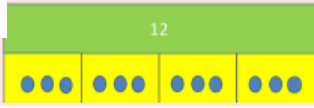
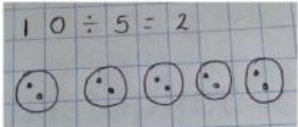



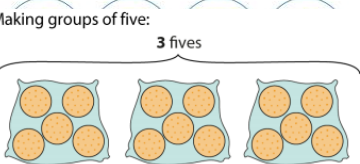
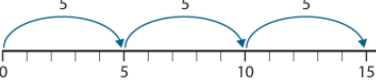
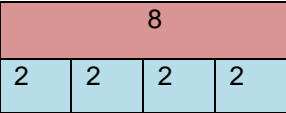
Objective and Strategy	Concrete	Pictorial	Abstract						
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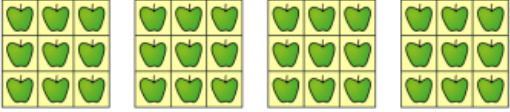
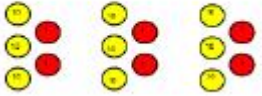

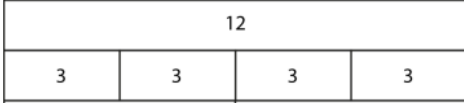
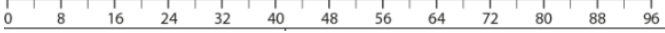

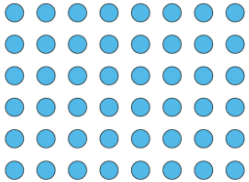
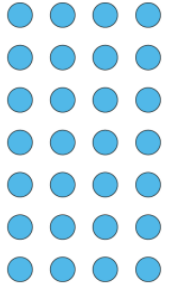
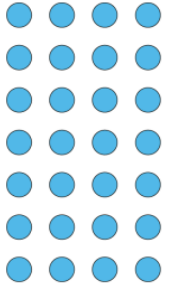
Objective and Strategy	Concrete	Pictorial	Abstract								
<p>Column multiplication</p>	 <p>Children can continue to be supported by place value counters at the stage of multiplication. This is initially done where there is no regrouping. It is important at this stage that the children multiply the ones first. The corresponding long multiplication alongside of it.</p>	<p>The grid method may be used to show how this relates to formal written method.</p> <table border="1" data-bbox="920 352 1294 443"> <tr> <td>x</td> <td>300</td> <td>20</td> <td>7</td> </tr> <tr> <td>4</td> <td>1200</td> <td>80</td> <td>28</td> </tr> </table> <p>Bar modelling and number lines can support learners when solving problems with multiplication alongside the formal written methods.</p> 	x	300	20	7	4	1200	80	28	<p>$1144 \times 8 =$ </p> $\begin{array}{r} 1144 \\ \times 8 \\ \hline 32 \\ 320 \\ 800 \\ + 8000 \\ \hline 9152 \end{array}$ <p> → multiply by ones → multiply by tens → multiply by hundreds → multiply by thousands </p> 
x	300	20	7								
4	1200	80	28								

Objective and Strategy	Concrete	Pictorial	Abstract																																																																				
<p>Column multiplication for 3 and 4 digits</p>	 <p>Children can continue to be supported by place value counters at the stage of multiplication. This is initially done where there is no regrouping. It is important at this stage that the children multiply the ones first. The corresponding long multiplication alongside of it.</p>	<p>The grid method may be used to show how this relates to formal written method.</p> <table border="1" data-bbox="920 316 1294 405"> <tr> <td>x</td> <td>300</td> <td>20</td> <td>7</td> </tr> <tr> <td>4</td> <td>1200</td> <td>80</td> <td>28</td> </tr> </table>	x	300	20	7	4	1200	80	28	<p>$1144 \times 8 =$ </p> $\begin{array}{r} 1144 \\ \times 8 \\ \hline 32 \\ 320 \\ 800 \\ + 8000 \\ \hline 9152 \end{array}$ <p> → multiply by ones → multiply by tens → multiply by hundreds → multiply by thousands </p> <p>This will lead to a compact method.</p>  <table border="1" data-bbox="1711 592 1995 815"> <tr> <td></td> <td>1</td> <td>1</td> <td>4</td> <td>4</td> </tr> <tr> <td>x</td> <td></td> <td></td> <td></td> <td>8</td> </tr> <tr> <td></td> <td colspan="4"><hr/></td> </tr> <tr> <td></td> <td>9</td> <td>1</td> <td>5</td> <td>2</td> </tr> <tr> <td></td> <td colspan="4"><hr/></td> </tr> <tr> <td></td> <td>1</td> <td>3</td> <td>3</td> <td></td> </tr> </table>		1	1	4	4	x				8		<hr/>					9	1	5	2		<hr/>					1	3	3																															
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<p>Column multiplication</p>	<p>Manipulatives may still be used with the corresponding long multiplication modelled alongside.</p>	<p>$100 + 80 + 30 + 24 = 234$</p> <table border="1" data-bbox="920 932 1173 1098"> <tr> <td></td> <td>10</td> <td>8</td> </tr> <tr> <td>10</td> <td>100</td> <td>80</td> </tr> <tr> <td>3</td> <td>30</td> <td>24</td> </tr> </table> <p>Introduce long multiplication alongside grid method to show the relationship between the answers in each row.</p>		10	8	10	100	80	3	30	24	<table border="1" data-bbox="1653 852 1861 1091"> <tr> <td></td> <td>1</td> <td>8</td> </tr> <tr> <td>x</td> <td>1</td> <td>3</td> </tr> <tr> <td></td> <td colspan="2"><hr/></td> </tr> <tr> <td></td> <td>5</td> <td>4</td> </tr> <tr> <td></td> <td>1</td> <td>8</td> </tr> <tr> <td></td> <td colspan="2"><hr/></td> </tr> <tr> <td></td> <td>2</td> <td>3</td> </tr> <tr> <td></td> <td colspan="2"><hr/></td> </tr> <tr> <td></td> <td>2</td> <td>3</td> </tr> </table> <p> 18×3 on the first row. $(8 \times 3 = 24, \text{ carrying the } 2 \text{ for } 20, \text{ then } 1 \times 3)$ 18×10 on the 2nd row. Show multiplying by 10 by putting the zero units in first. </p> <table data-bbox="1653 1114 1800 1385"> <tr> <td></td> <td>2</td> <td>3</td> <td>1</td> </tr> <tr> <td></td> <td>1</td> <td>3</td> <td>4</td> </tr> <tr> <td>x</td> <td>1</td> <td>8</td> <td></td> </tr> <tr> <td></td> <td colspan="3"><hr/></td> </tr> <tr> <td></td> <td>1</td> <td>3</td> <td>4</td> </tr> <tr> <td></td> <td>1</td> <td>0</td> <td>7</td> </tr> <tr> <td></td> <td colspan="3"><hr/></td> </tr> <tr> <td></td> <td>2</td> <td>4</td> <td>1</td> </tr> </table> <p> 1342×8 1342×10 </p>		1	8	x	1	3		<hr/>			5	4		1	8		<hr/>			2	3		<hr/>			2	3		2	3	1		1	3	4	x	1	8			<hr/>				1	3	4		1	0	7		<hr/>				2	4	1
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<u>Objective and Strategy</u>	<u>Concrete</u>	<u>Pictorial</u>	<u>Abstract</u>
<p>Multiplying decimals up to 2 decimal places by a single digit.</p>	<p>Use place value counters where appropriate if necessary.</p>		<p>Remind children that the single digit belongs in the unit's column. Line up the decimal points in the question and the answer.</p> 

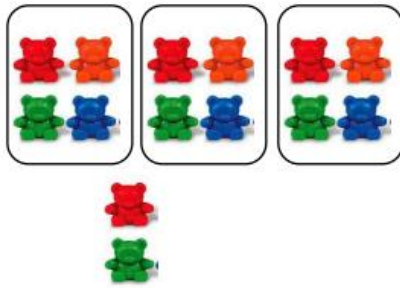
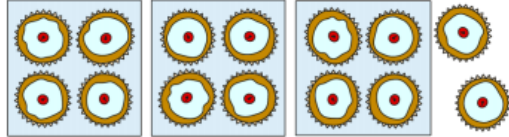
Objective and Strategy	Concrete	Pictorial	Abstract
<p>Division as sharing</p>	<p>Use a range of equipment to introduce sharing.</p>  <p>Can you share 6 into two groups?</p> <p>I have 10 cubes, can you share them equally in 2 groups?</p>	<p>Sharing objects pictorially</p> <p>12 children get into teams of 4 to play a game. How many teams are there?</p>  <p>6 sweets are shared between 2 people. How many do they each have?</p> <p>$8 \div 2 = \square$</p>	<p>Share 9 buns between three people. $9 \div 3 = 3$</p> 

Objective and Strategy	Concrete	Pictorial	Abstract
<p>Division as sharing</p>	<p>Use a range of equipment to develop sharing.</p>  <p>Share the 12 cubes equally into the boxes.</p>  <p>I have 10 cubes, can you share them equally in 2 groups?</p>	<p>'I have twenty conkers, and I share them equally between five children. How many conkers does each child get?'</p>  <p>Children use pictures or shapes to share quantities.</p>  <p>Children use bar modelling to show and support understanding.</p> <p>$12 \div 4 = 3$</p>	<p>$12 \div 3 = 4$</p>
<p>Division as grouping</p>	<p>Divide quantities into equal groups. Use cubes, counters, objects and place value counters to help understanding.</p>   	 <p>'There are eight socks. If I put them into pairs, how many pairs will there be?'</p> <p>Making groups of five:</p>  <p>3 fives</p>  <p>$5 + 5 + 5 = 15$ $15 \div 5 = 3$</p> <p>'Fifteen divided into groups of five is equal to three.'</p>  <p>Link images to bar modelling. The bar model to be the whole.</p> <p>Also link number lines for grouping.</p>	<p>$28 \div 7 = 4$</p> <p>Divide 28 into 7 groups. How many are in each group?</p> <p>Max is filling party bags with sweets. He has 20 sweets altogether and decides to put 5 in every bag. How many bags can he fill?</p>

Objective and Strategy	Concrete	Pictorial	Abstract												
<p>Division as grouping</p>	<p>36 can be divided into 4 groups = 9</p>  <p>$9 \times 3 = 32$</p>  <p>Use cubes, counters, objects or place value counters to aid understanding.</p>  <p>24 can be divided into groups of 6 = 4</p>	<p>Use bar modelling to help understanding of grouping.</p>  <p>Use missing-number sequences to build up grouping.</p> <p>Missing-number sequences/problems: 'Fill in the missing numbers.'</p> <table border="1" data-bbox="974 523 1482 561"> <tr> <td>0</td> <td>4</td> <td>8</td> <td>12</td> <td>16</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> <p>Number line:</p>  <p>Use number lines to aid division problems. 'How many groups of 8 in 72?'</p>	0	4	8	12	16								<p>How many groups of 8 in 32?</p> <p>$32 \div 8 = 4$</p>
0	4	8	12	16											
<p>Division with arrays</p>	<p>Link division to multiplication with arrays and think about the number sentences that can be created.</p> <p>$20 \div 4 = 5$ $20 \div 5 = 4$ $5 \times 4 = 20$ $4 \times 5 = 20$</p> 	<p>Draw an area and use lines to split them up into groups. Make division and multiplication sentences from them.</p> <p>Array problem:</p>  <ul style="list-style-type: none"> 'How many groups of six are there?' <input type="text"/> \times 6 = <input type="text"/> 'How many groups of three are there?' <input type="text"/> \times 3 = <input type="text"/> <p>'Circle the groups of four and complete the sentence.'</p>  <p>There are ___ groups of four.</p> <p>'Circle the four equal groups and complete the sentence.'</p>  <p>There are four groups of ___.</p>	<p>Find the inverse of multiplication and division sentences.</p> <p>'Fill in the missing numbers.'</p> <p>$3 \times 4 = \square$ $5 \times 4 = \square$ $4 \times 3 = \square$ $\square \times 4 = 20$ $12 \div 4 = \square$ $20 \div 4 = \square$</p> <p>'What multiplication fact can be used to solve this division calculation?'</p> <p>$24 \div 4 = ?$ I can use this multiplication fact: $\square \times \square = \square$</p>												

Division with remainders

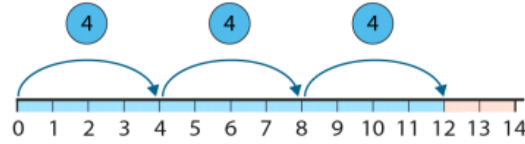
'A baker has fourteen cakes. He sells cakes in boxes of four. How can he box the cakes?'



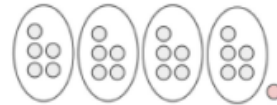
$14 \div 3 = 4 \text{ r } 2$

Use objects between groups and see how much is left over.

'A baker has fourteen cakes. He sells cakes in boxes of four. How can he box the cakes?'

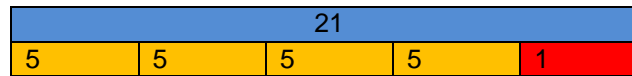


- 'One box of four is four.'
- 'Two boxes of four are eight.'
- 'Three boxes of four are twelve.'
- 'There are two cakes left over.'



$21 \div 5 = 4 \text{ r } 1$

Use bar models to show division with remainders



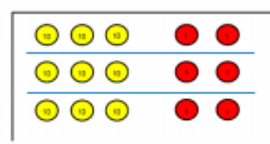
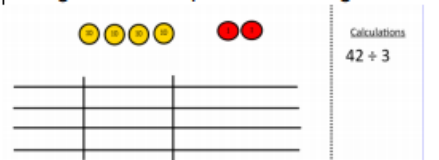


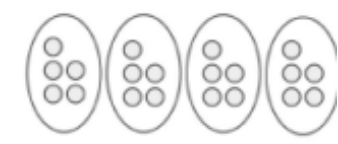
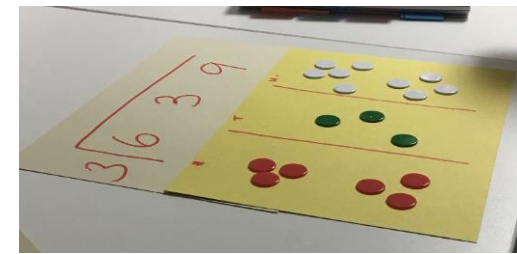
Use a number line to jump equally. Then you will see how many more you need to jump to find the remainder.

Draw dots and group them to divide an amount and clearly show a remainder.

Complete written divisions and show remainders using r.

14	÷	4	=	3	r	2
dividend	÷	divisor	=	quotient	r	remainder

$22 \div 4 = \square \text{ r } \square$
 $23 \div 4 = \square \text{ r } \square$

Objective and Strategy	Concrete	Pictorial	Abstract
<p>Divide at least 3 digit numbers by 1 digit.</p> <p>Short division.</p>	<p style="text-align: center;">Tens Units $96 \div 3$</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <p>3</p>  </div> <div style="text-align: center;"> <p>Calculations</p> <p>$42 \div 3$</p>  </div> </div> <p>Use place value counters to divide using the bus stop method alongside.</p> <p>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.</p>  <p>We exchange this ten for ten ones and then share the ones equally among the groups.</p>  <p>We look how much in 1 group so the answer is 14.</p>	<p>Children can continue to draw diagrams with dots or circle and circle to help them to divide into equal groups.</p>  <p>Encourage children to move towards counting multiples to divide more efficiently.</p> 	<p>Begin with divisions that divide equally with no remainder.</p> $\begin{array}{r} 218 \\ 3 \overline{) 654} \end{array}$ <p>Move onto division with a remainder.</p> $\begin{array}{r} 86 \text{ r } 2 \\ 5 \overline{) 432} \end{array}$ <p>Finally move into decimal places to divide the total accurately.</p> $\begin{array}{r} 14.6 \\ 35 \overline{) 511.0} \end{array}$ $\begin{array}{r} 0663 \text{ r } 5 \\ 8 \overline{) 5309} \end{array}$

Long
division

Start with a remainder in the ones.

$$\begin{array}{r} 14.6 \\ 35 \overline{) 511.0} \\ \underline{16} \\ 21 \\ \underline{21} \\ 0 \end{array}$$

$$\begin{array}{r} \text{h t o} \\ 041 \text{ R}1 \\ 4 \overline{) 165} \\ \underline{16} \\ 5 \end{array}$$

4 does not go into 1 (hundred). So combine the 1 hundred with the 6 tens (160).

4 goes into 16 four times.

4 goes into 5 once, leaving a remainder of 1.

$$\begin{array}{r} \text{th h t o} \\ 0400 \text{ R}7 \\ 8 \overline{) 3207} \\ \underline{32} \\ 07 \end{array}$$

8 does not go into 3 of the thousands. So combine the 3 thousands with the 2 hundreds (3,200).

8 goes into 32 four times (3,200 ÷ 8 = 400)

8 goes into 0 zero times (tens)

8 goes into 7 zero times, and leaves a remainder of 7.

$$\begin{array}{r} \text{h t o} \\ 061 \\ 4 \overline{) 247} \\ \underline{4} \\ 3 \end{array}$$

When dividing the ones, 4 goes into 7 one time. Multiply $1 \times 4 = 4$, write that four under the 7, and subtract. This finds us the remainder of 3.

Check: $4 \times 61 + 3 = 247$




$$\begin{array}{r} \text{th h t o} \\ 0402 \\ 4 \overline{) 1609} \\ \underline{8} \\ 1 \end{array}$$

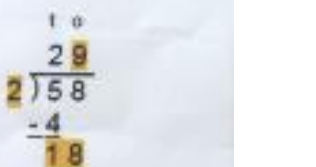
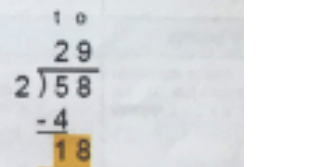
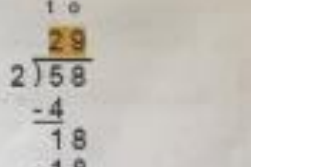
When dividing the ones, 4 goes into 9 two times. Multiply $2 \times 4 = 8$, write that eight under the 9, and subtract. This finds us the remainder of 1.

Check: $4 \times 402 + 1 = 1,609$

Long division

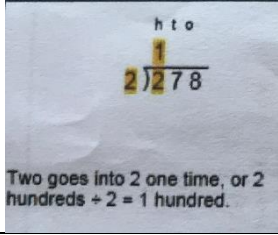
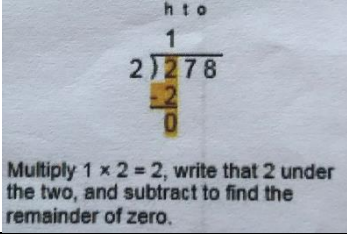
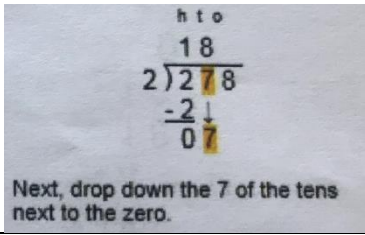
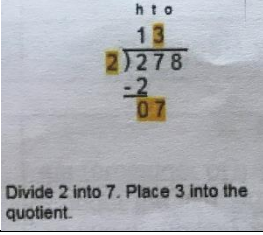
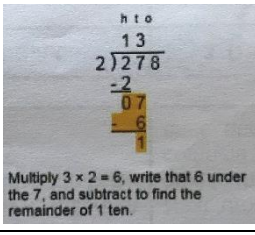
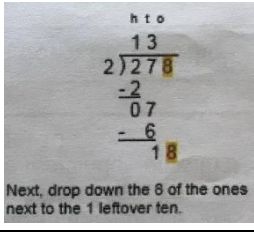
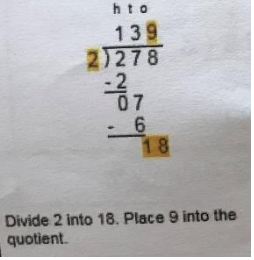
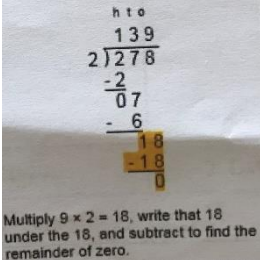
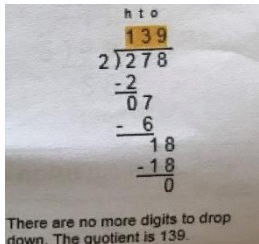
Step 2 – a remainder in the tens.

1. Divide	2. Multiply and Subtract	3. Drop down the next digit.
 <p>Two goes into 5 two times, or 5 tens – 2 = 2 whole tens – but there is a remainder!</p>	 <p>To find it, multiply $2 \times 2 = 4$, write that 4 under the five, and subtract to find the remainder of 1 ten.</p>	 <p>Next, drop down the 8 of the ones next to the leftover 1 ten. You combine the remainder ten with 8 ones, and get 18.</p>

1. Divide	2. Multiply and Subtract	3. Drop down the next digit.
 <p>Divide 2 into 18. Place 9 into the quotient.</p>	 <p>Multiply $9 \times 2 = 18$, write that 18 under the 18, and subtract.</p>	 <p>The division is over since there are no more digits in the dividend. The quotient is 29</p>

Long
division

Step 2 – a remainder in any of the place values

<p>1. Divide</p>  <p>Two goes into 2 one time, or 2 hundreds + 2 = 1 hundred.</p>	<p>2. Multiply and Subtract</p>  <p>Multiply $1 \times 2 = 2$, write that 2 under the two, and subtract to find the remainder of zero.</p>	<p>3. Drop down the next digit.</p>  <p>Next, drop down the 7 of the tens next to the zero.</p>
<p>4. Divide</p>  <p>Divide 2 into 7. Place 3 into the quotient.</p>	<p>5. Multiply and Subtract</p>  <p>Multiply $3 \times 2 = 6$, write that 6 under the 7, and subtract to find the remainder of 1 ten.</p>	<p>6. Drop down the next digit.</p>  <p>Next, drop down the 8 of the ones next to the 1 leftover ten.</p>
<p>7. Divide</p>  <p>Divide 2 into 18. Place 9 into the quotient.</p>	<p>8. Multiply and Subtract</p>  <p>Multiply $9 \times 2 = 18$, write that 18 under the 18, and subtract to find the remainder of zero.</p>	<p>9. Drop down the next digit.</p>  <p>There are no more digits to drop down. The quotient is 139.</p>