

# Clutton Primary School

## Calculation Policy



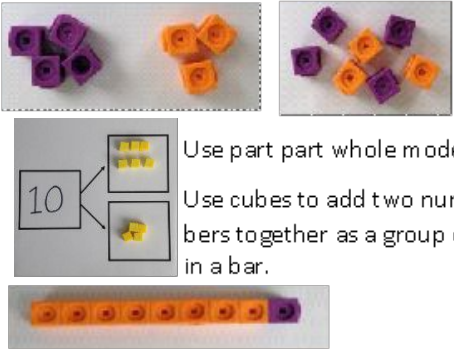
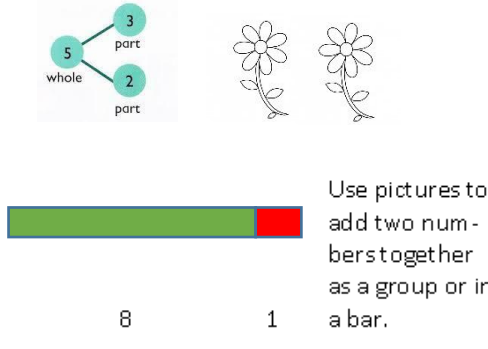
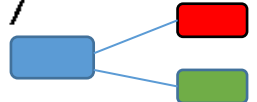

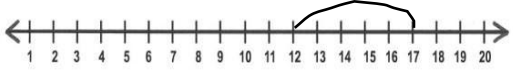
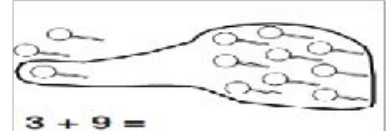
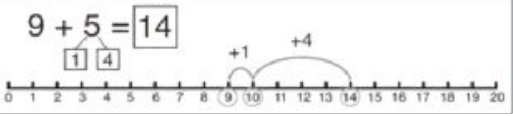

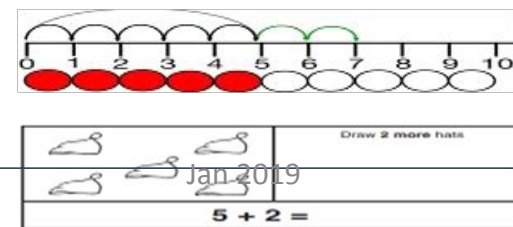
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This policy has been largely adapted from the White Rose Maths Hub Calculation Policy with further material added.  
It is a working document and will be revised and amended as necessary.

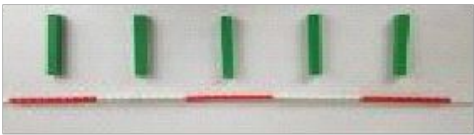
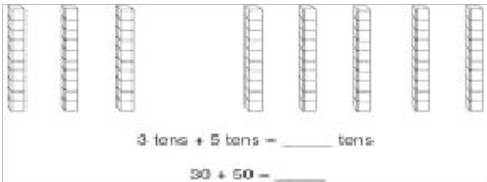
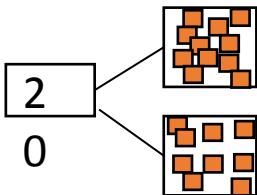
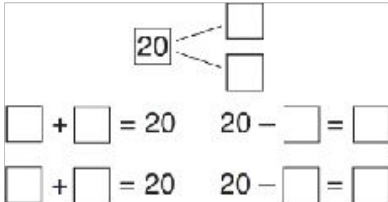
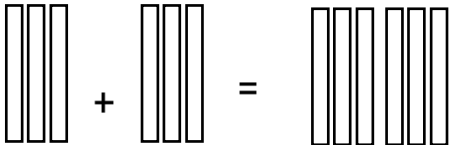
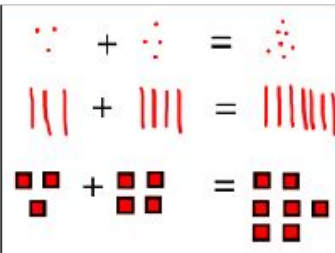


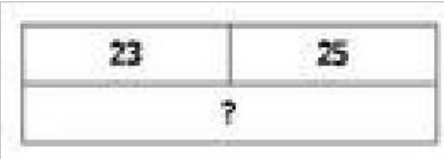
# Y1

# ADDITION +

Objective & Strategy	Concrete	Pictorial	Abstract
Combining two parts to make a whole: part- whole model	 <p>Use part part whole model.</p> <p>Use cubes to add two numbers together as a group or in a bar.</p>	 <p>Use pictures to add two numbers together as a group or in a bar.</p>	<p><math>4 + 3 = 7</math></p>  <p><math>10 = 6 + 4</math></p> <p>Use the part-part whole diagram as shown above to move into the abstract.</p>
Starting at the bigger number and counting on	 <p>Start with the larger number on the bead string and then count on to the smaller number 1 by 1 to find the answer.</p>	<p><math>12 + 5 = 17</math></p>  <p>Start at the larger number on the number line and count on in ones or in one jump to find the answer.</p>	<p><math>5 + 12 = 17</math></p> <p>Place the larger number in your head and count on the smaller number to find your answer.</p>
Regrouping to make 10.  <i>This is an essential skill for column addition later.</i>	<p><math>6 + 5 = 11</math></p> <p>Start with the bigger number and use the smaller number to make 10.</p> <p>Use ten frames.</p>	 <p>Use pictures or a number line. Regroup or partition the smaller number using the part part whole model to make 10.</p>  <p><math>9 + 5 = 14</math></p>	<p><math>7 + 4 = 11</math></p> <p>If I am at seven, how many more do I need to make 10. How many more do I add on now?</p>
Represent & use number bonds and related subtraction facts within 20	 <p>2 more than 5.</p>	 <p>5 + 2 =</p>	<p>Emphasis should be on the language</p> <p>'1 more than 5 is equal to 6.'</p> <p>'2 more than 5 is 7.'</p> <p>'8 is 3 more than 5.'</p>

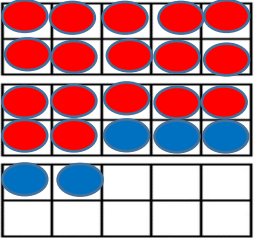
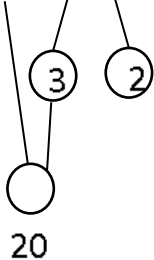
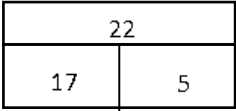

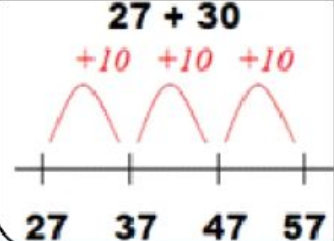
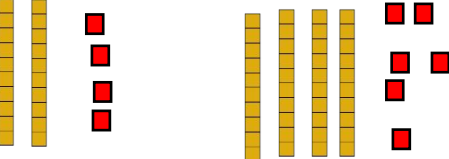
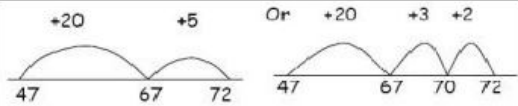
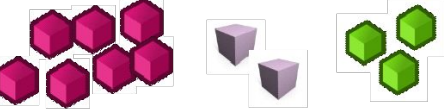
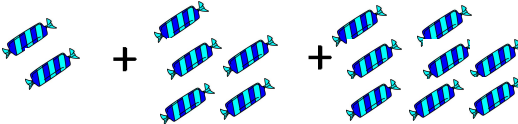

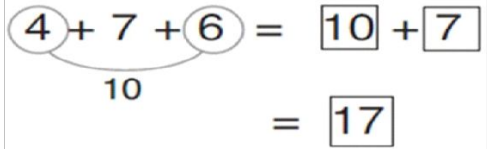
Y2

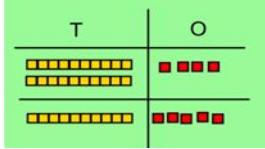
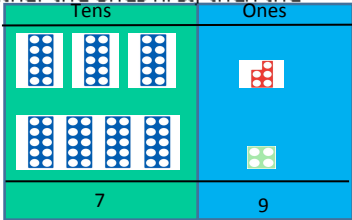
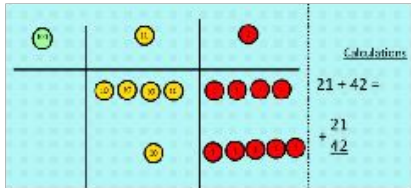
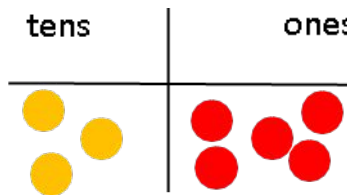
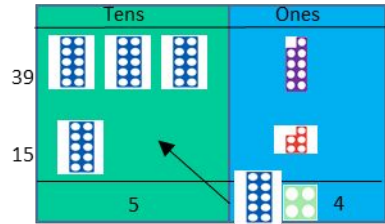
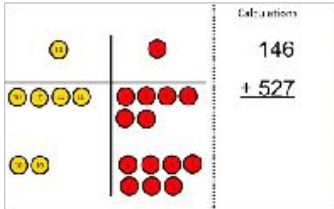
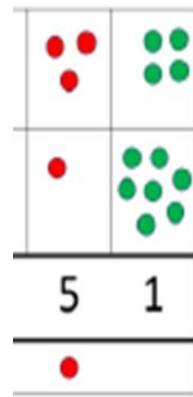
## ADDITION +

Objective & Strategy	Concrete	Pictorial	Abstract
Adding multiples of ten	$50 = 30 + 20$  Model using dienes and bead strings	 $3 \text{ tens} + 5 \text{ tens} = \text{ } \text{tens}$ $30 + 50 = \text{ }$ Use representations for base ten.	$20 + 30 = 50$ $70 = 50 + 20$ $40 + \square = 60$
Use known number facts  Part part whole	 Children explore ways of making numbers within 20	 $\square + \square = 20$ $20 - \square = \square$ $\square + \square = 20$ $20 - \square = \square$	$\square + 1 = 16$ $16 - 1 = \square$ $1 + \square = 16$ $16 - \square = 1$
Using known facts	$\square\square\square + \square\square\square = \square\square\square\square\square$  $\square\square\square + \square\square\square = \square\square\square\square\square$	 Children draw representations of T and O	$3 + 4 + 7$ leadsto $30 + 40 = 70$
Bar model	 $3 + 4 = 7$	 $7 + 3 = 10$	 $23 + 25 = 48$

# Y2

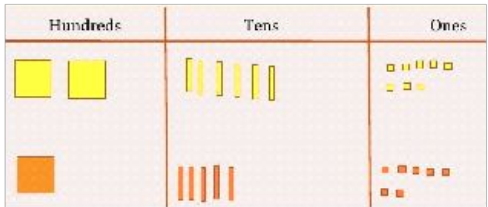
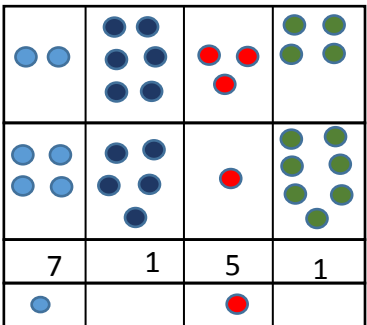
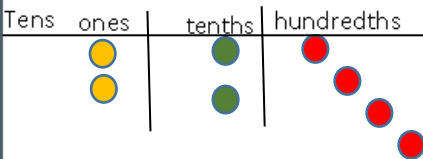
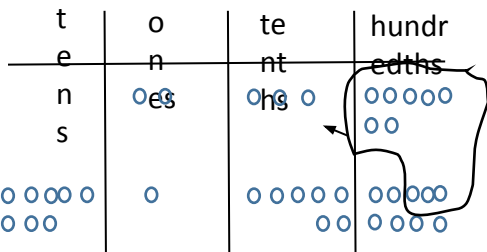
# ADDITION +

Objective & Strategy	Concrete	Pictorial	Abstract
Add a two digit number and ones	 <p>17 + 5 = 22</p> <p>Use ten frame to make 'magic ten'</p> <p>Children explore the pattern.</p> <p>17 + 5 = 22</p> <p>27 + 5 = 32</p>	<p>17 + 5 = 22</p> <p>Use part part whole and number line to model.</p> 	<p>17 + 5 = 22</p> <p>Explore related facts</p> <p>17 + 5 = 22</p> <p>5 + 17 = 22</p> <p>22 - 17 = 5</p> <p>22 - 5 = 17</p> 
Add a 2 digit number and tens	 <p>25 + 10 = 35</p> <p>Explore that the ones digit does not change</p>		<p>27 + 10 = 37</p> <p>27 + 20 = 47</p> <p>27 + 10 = 37</p>
Add two 2-digit numbers	 <p>Model using dienes, place value counters and numicon</p>	 <p>Use number line and bridge ten using part whole if necessary.</p>	<p>25 + 47</p> <p>20 + 5      40 + 7</p> <p>20 + 40 = 60</p> <p>5 + 7 = 12</p> <p>60 + 12 = 72</p>
Add three 1-digit numbers	 <p>Combine to make 10 first if possible, or bridge 10 then add third digit</p>	 <p>Regroup and draw representation.</p>  <p>4 + 7 + 6 = 15</p>	 <p>Combine the two numbers that make/ bridge ten then add on the third.</p>

Objective & Strategy	Concrete	Pictorial	Abstract
<p>Column Addition—no regrouping (friendly numbers)</p> <p>Add two or three 2 or 3-digit numbers.</p>	<p>Model using Dienes or numicon</p>  <p>Add together the ones first, then the tens.</p>   <p>Move to using place value counters</p>	<p>Children move to drawing the counters using a tens and one frame.</p> 	$\begin{array}{r} 223 \\ + 114 \\ \hline 337 \end{array}$ <p>Add the ones first, then the tens, then the hundreds.</p>
<p>Column Addition with regrouping</p>	 <p>Exchange ten ones for a ten. Model using numicon and pv counters.</p> 	 <p>Children can draw a representation of the grid to further support their understanding, carrying the ten <u>undemeath</u> the line</p>	$\begin{array}{r} 20 + 5 \\ 40 + 8 \\ \hline 60 + \\ 13 = \\ 73 \end{array}$ <p>Start by partitioning the numbers before formal column to show the exchange.</p> $\begin{array}{r} 536 \\ + 85 \\ \hline 621 \\ 11 \end{array}$



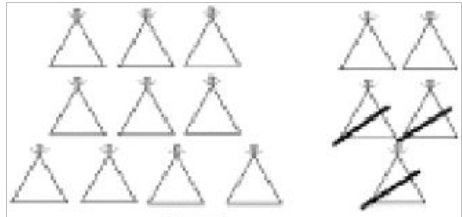


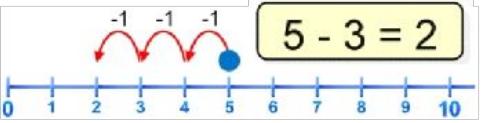
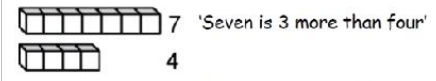
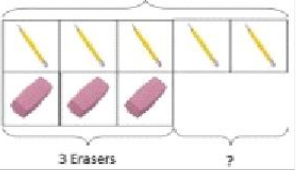
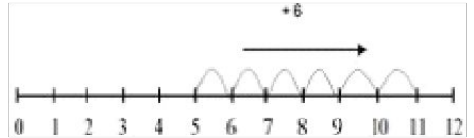
# Y4-6

# ADDITION +

Objective & Strategy	Concrete	Pictorial	Abstract
Y4—add numbers with up to 4 digits	<p>counters to add, exchanging ten ones for a ten and ten tens for a hundred and ten hundreds for a thousand.</p> 	 <p>Draw representations using pv grid.</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>		$\begin{array}{r} 72.8 \\ +54.6 \\ \hline 127.4 \\ 11 \end{array}$ $\begin{array}{r} £23.59 \\ +£7.55 \\ \hline £31.14 \\ 11 \end{array}$
<p>Y6—add several numbers of increasing complexity</p> <p>Including adding money, measure and decimals with different numbers of decimal points.</p>	As Y5	As Y5	$\begin{array}{r} 81059 \\ 3668 \\ 15301 \\ +20551 \\ \hline 120579 \\ 1111 \end{array}$ $\begin{array}{r} 23.361 \\ 9.080 \\ 59.770 \\ +1.300 \\ \hline 93.511 \\ 212 \end{array}$ <p>Insert zeros for place holders.</p>

# Y1

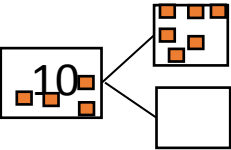
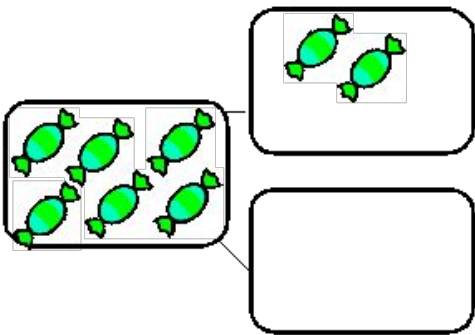
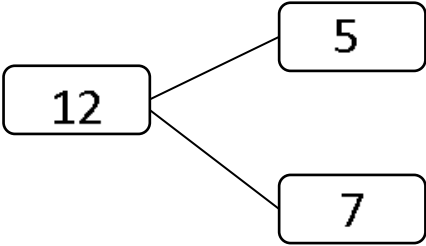

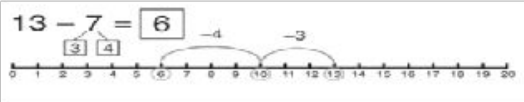
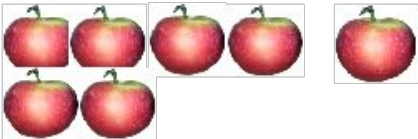


# SUBTRACTION -

Objective & Strategy	Concrete	Pictorial	Abstract
Taking away ones.	<p>Use physical objects, counters , cubes etc to show how objects can be taken away.</p>  $6 - 4 = 2$  $4 - 2 = 2$	 $15 - 3 = 12$ <p>Cross out drawn objects to show what has been taken away.</p>	$7 - 4 = 3$ $16 - 9 = 7$
Counting back	 <p>Move objects away from the group, counting backwards.</p>  <p>Move the beads along the bead string as you count backwards.</p>	 <p>Count back in ones using a number line.</p>	Put 13 in your head, count back 4. What number are you at?
Find the Difference	<p>Compare objects and amounts</p>  <p>5 Pencils</p>  <p>3 Erasers</p> <p>Lay objects to represent bar model.</p>	<p>Count on using a number line to find the difference.</p>  <p>Jan 2019</p>	Hannah has 12 sweets and her sister has 5. How many more does Hannah have than her sister.?



# Y1

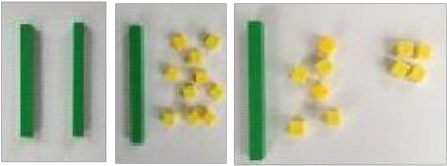

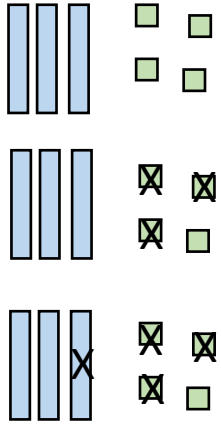
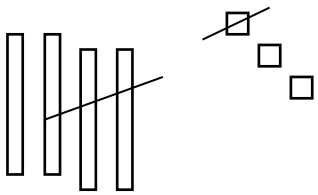
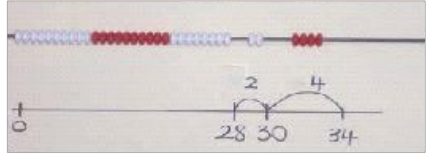
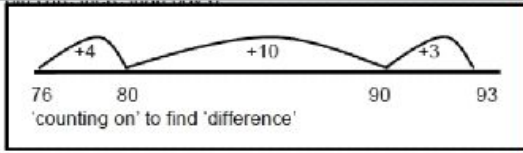
# SUBTRACTION -

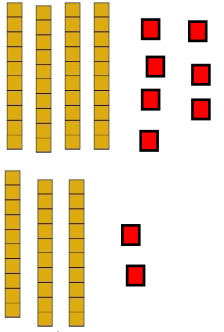
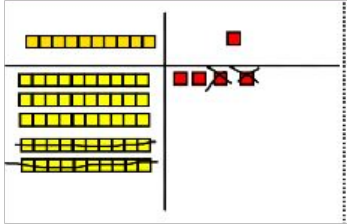
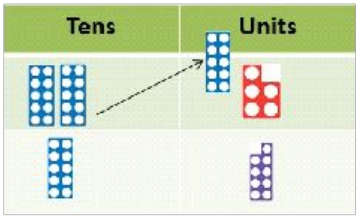
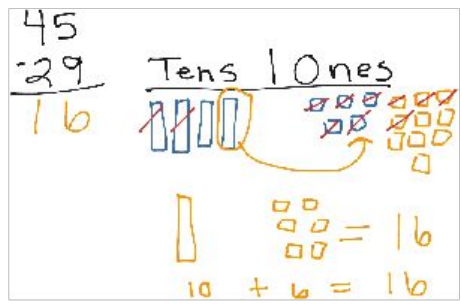

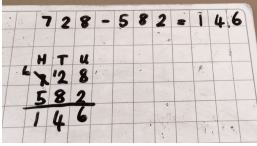
Objective & Strategy	Concrete	Pictorial	Abstract
<p>Represent and use number bonds and related subtraction facts within 20</p> <p>Part Part Whole model</p>	 <p>Link to addition. Use PPW model to model the inverse.</p> <p>If 10 is the whole and 6 is one of the parts, what is the other part?</p> $10 - 6 = 4$	 <p>Use pictorial representations to show the part.</p>	<p>Move to using numbers within the part whole model.</p> 
<p>Make 10</p>	<p>14—9</p>  <p>Make 14 on the ten frame. Take 4 away to make ten, then take one more away so that you have taken 5.</p>	<p>13—7</p>  <p>Jump back 3 first, then another 4. Use ten as the stopping point.</p>	<p>16—8</p> <p>How many do we take off first to get to 10? How many left to take off?</p>
<p>Bar model</p>	 $5 - 2 = 3$	<p>10-2=8</p> 	 $10 = 8 + 2$ $10 = 2 + 8$ $10 - 2 = 8$



# Y2

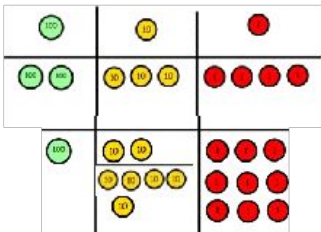
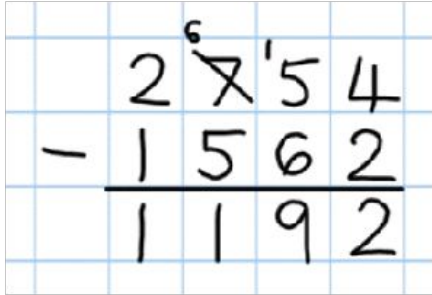
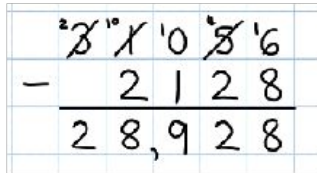
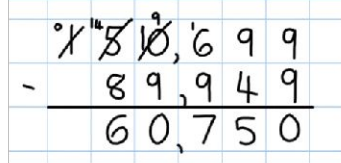
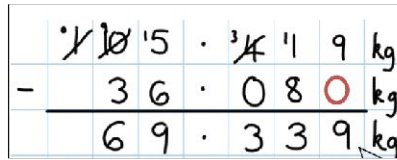
# SUBTRACTION -

Objective & Strategy	Concrete	Pictorial	Abstract
Regroup a ten into ten ones	 <p>Use a PV chart to show how to change a ten into ten ones, use the term 'take and make'</p>		$20 - 4 = 16$
Partitioning to subtract without regrouping. <i>'Friendly numbers'</i>	$34 - 13 = 21$  <p>Use Dienes to show how to partition the number when subtracting without regrouping.</p>	<p>Children draw representations of Dienes and cross off.</p>  $43 - 21 = 22$	$43 - 21 = 22$
Make ten strategy <i>Progression should be crossing one ten, crossing more than one ten, crossing the hundreds.</i>	 $34 - 28$ <p>Use a bead bar or bead strings to model counting to next ten and the rest.</p>	 <p>Use a number line to count on to next ten and then the rest.</p>	$93 - 76 = 17$

Objective & Strategy	Concrete	Pictorial	Abstract
Column subtraction without regrouping (friendly numbers)	 $47 - 32$ <p>Use base 10 or Numicon to model</p>	 <p>Draw representations to support understanding</p>	$47 - 24 = 23$ $\begin{array}{r} 40 + 7 \\ - 20 + 4 \\ \hline 20 + 3 \end{array}$ <p>Intermediate step may be needed to lead to clear subtraction understanding.</p>
Column subtraction with regrouping	 <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>

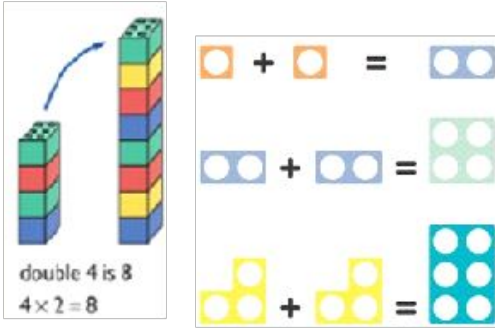
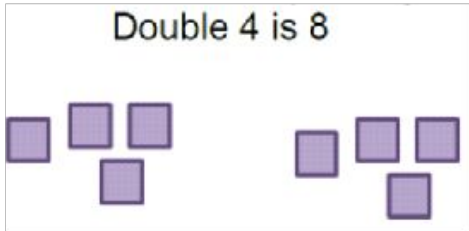
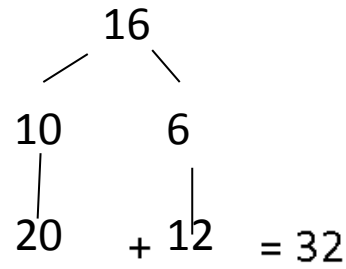
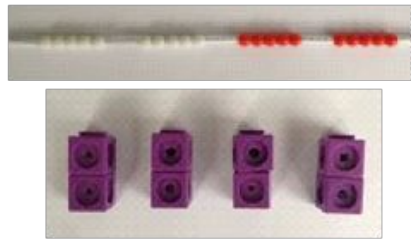
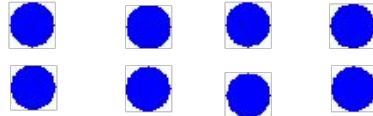
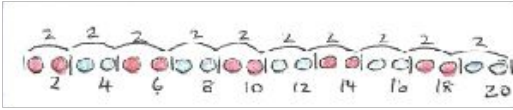
# Y4-6

# SUBTRACTION -

Objective & Strategy	Concrete	Pictorial	Abstract
<b>Subtracting tens and ones</b>  <b>Year 4 subtract with up to 4 digits.</b>  <i>Introduce decimal subtraction through context of money</i>	<p>234 - 179</p>  <p>Model process of exchange using Numicon, base ten and then move to PV counters.</p>	<p>Children to draw pv counters and show their exchange—see Y3</p>	 <p>Use the phrase 'take and make' for exchange</p>
<b>Year 5- Subtract with at least 4 digits, including money and measures.</b>  <i>Subtract with decimal values, including mixtures of integers and decimals and aligning the decimal</i>	<p>As Year 4</p>	<p>Children to draw pv counters and show their exchange—see Y3</p>	 <p>Use zeros for place-holders.</p>
<b>Year 6—Subtract with increasingly large and more complex numbers and decimal values.</b>		<p>Jan 2019</p>	 

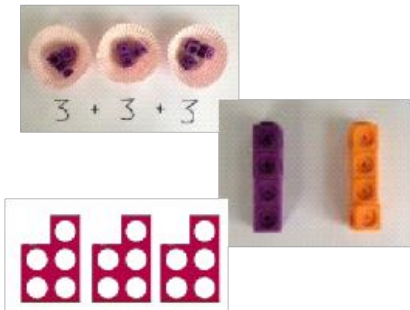
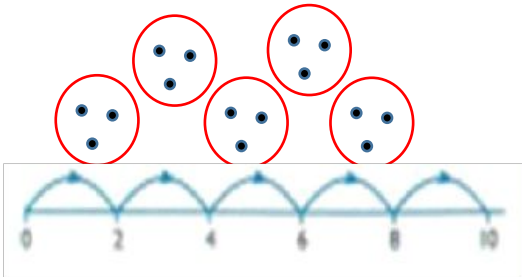

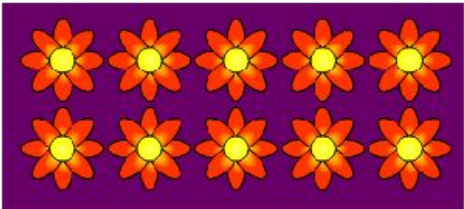
# Y1

# MULTIPLICATION

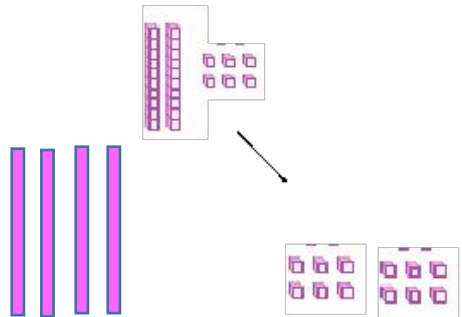
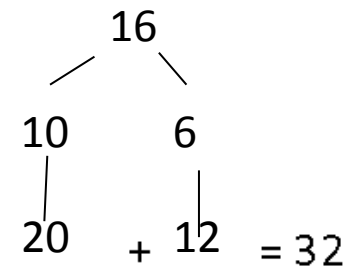
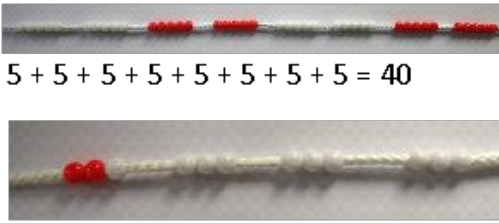

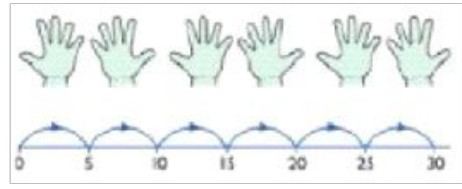
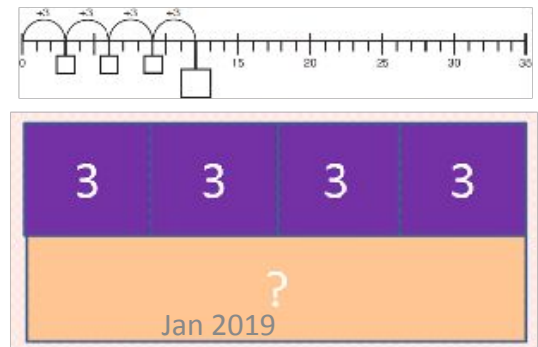
Objective & Strategy	Concrete	Pictorial	Abstract
Doubling	<p>Use practical activities using manipulatives including cubes and Numicon to demonstrate doubling</p>  <p>The image shows two concrete methods for doubling. On the left, a stack of 4 colored cubes (green, red, blue, yellow) is shown next to a stack of 8 cubes, with an arrow indicating the doubling process. Below this, it says 'double 4 is 8' and '4 x 2 = 8'. On the right, three Numicon shapes are shown: two orange shapes (each with 2 dots) equaling one blue shape (4 dots); two blue shapes (each with 2 dots) equaling one green shape (4 dots); and two yellow shapes (each with 2 dots) equaling one teal shape (4 dots).</p>	<p>Draw pictures to show how to double numbers</p>  <p>The image shows a pictorial representation of doubling. It says 'Double 4 is 8'. There are two groups of four purple squares. The first group has four squares arranged in a 2x2 grid. The second group has four squares arranged in a 2x2 grid.</p>	<p>Partition a number and then double each part before recombining it back together.</p>  <p>The image shows a tree diagram for doubling. It starts with 16 at the top, which branches into 10 and 6. Below 10 is 20, and below 6 is 12. These are then added together: 20 + 12 = 32.</p>
Counting in multiples	<p>Count the groups as children are skip counting, children may use their fingers as they are skip counting.</p>  <p>The image shows two concrete methods for skip counting. On the top, a string of beads is shown with red beads grouped together. On the bottom, four purple cubes are shown, each with two dots, representing groups of two.</p>	 <p>The image shows eight blue circles arranged in two rows of four, representing groups of two.</p> <p>Children make representations to show counting in multiples.</p>  <p>The image shows a number line from 2 to 20, with jumps of 2. The numbers are 2, 4, 6, 8, 10, 12, 14, 16, 18, 20. Above each number is a small '2' and a bracket indicating the jump.</p>	<p>Count in multiples of a number aloud.</p> <p>Write sequences with multiples of numbers.</p> <p>2, 4, 6, 8, 10</p> <p>5, 10, 15, 20, 25, 30</p>

# Y1

# MULTIPLICATION

Objective & Strategy	Concrete	Pictorial	Abstract
Repeated addition	 <p>Use different objects to add equal groups</p>	<p>Use pictorial including number lines to solve prob</p> <p>There are 3 sweets in one bag. How many sweets are in 5 bags altogether?  <math>3+3+3+3+3=15</math></p> 	<p>Write addition sentences to describe objects and pictures.</p> 
Understanding arrays	<p>Use objects laid out in arrays to find the answers to 2 lots 5, 3 lots of 2 etc.</p> 	<p>Draw representations of arrays to show understanding</p>	$3 \times 2 = 6$ $2 \times 5 = 10$






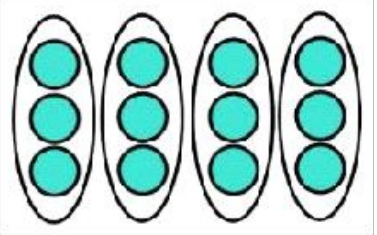
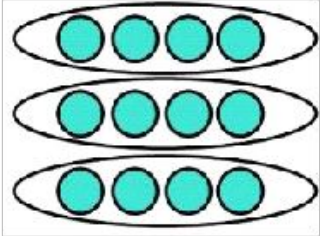

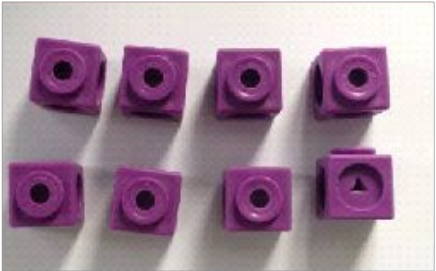
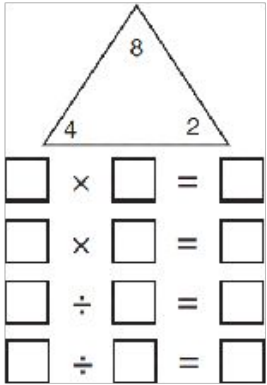
# Y2 MULTIPLICATION

Objective & Strategy	Concrete	Pictorial	Abstract
Doubling	<p>Model doubling using dienes and PV counters.</p>  $40 + 12 = 52$	<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>  $16 \begin{matrix} \swarrow & \searrow \\ 10 & 6 \end{matrix}$ $20 + 12 = 32$
Counting in multiples of 2, 3, 4, 5, 10 from 0 (repeated addition)	<p>Count the groups as children are skip counting, children may use their fingers as they are skip counting. Use bar models.</p>  $5 + 5 + 5 + 5 + 5 + 5 + 5 = 40$ 	<p>Number lines, counting sticks and bar models should be used to show representation of counting in multiples.</p>  	<p>Count in multiples of a number aloud.</p> <p>Write sequences with multiples of numbers.</p> <p>0, 2, 4, 6, 8, 10</p> <p>0, 3, 6, 9, 12, 15</p> <p>0, 5, 10, 15, 20, 25, 30</p> $4 \times 3 = \square$





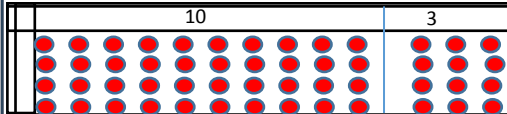
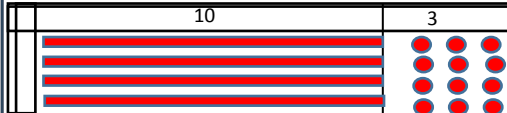
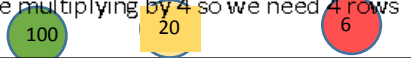

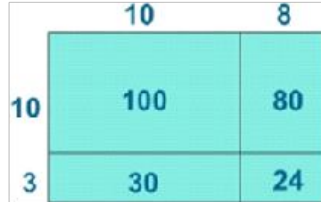
# Y2 MULTIPLICATION

Objective & Strategy	Concrete	Pictorial	Abstract
<p>Multiplication is commutative</p>	<p>Create arrays using counters, cubes and Numicon.</p>    <p>Pupils should understand that an array can represent different equations and that, as multiplication is commutative, the order of the multiplication does not affect the answer.</p>  	<p>Use representations of arrays to show different calculations and explore commutativity.</p>  	<p><math>12 = 3 \times 4</math></p> <p><math>12 = 4 \times 3</math></p> <div> <p>Use an array to write multiplication sentences and reinforce repeated addition.</p>  <p><math>5 + 5 + 5 = 15</math></p> <p><math>3 + 3 + 3 + 3 + 3 = 15</math></p> <p><math>5 \times 3 = 15</math></p> <p><math>3 \times 5 = 15</math></p> </div>
<p>Using the Inverse</p> <p><i>This should be taught alongside division, so pupils learn how they work alongside each other.</i></p>		 <p>Jan 2019</p>	<p><math>2 \times 4 = 8</math></p> <p><math>4 \times 2 = 8</math></p> <p><math>8 \div 2 = 4</math></p> <p><math>8 \div 4 = 2</math></p> <p><math>8 = 2 \times 4</math></p> <p><math>8 = 4 \times 2</math></p> <p><math>2 = 8 \div 4</math></p> <p><math>4 = 8 \div 2</math></p> <p>Show all 8 related fact family sentences.</p>

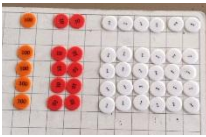
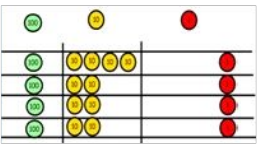
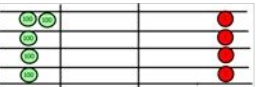
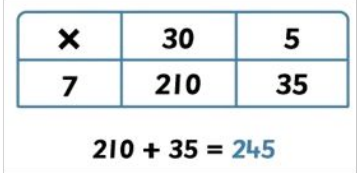
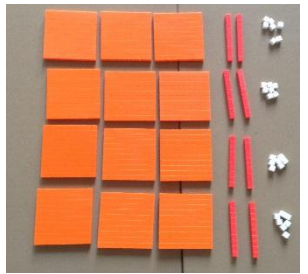
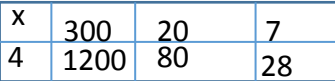
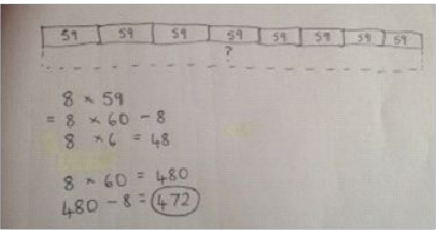
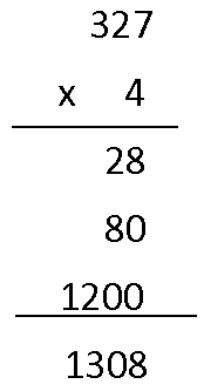




# Y3 MULTIPLICATION

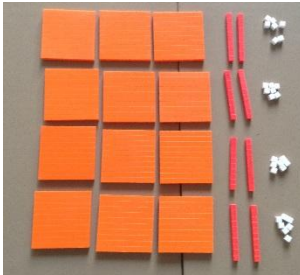


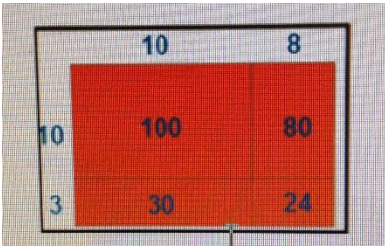
Objective & Strategy	Concrete	Pictorial	Abstract																					
Grid method	<p>Show the links with arrays to first introduce the grid method.</p>  <p>Move onto base ten to move towards a more compact method.</p>  <p>Move on to place value counters to show how we are finding groups of a number. We are multiplying by 4 so we need 4 rows</p>  <table border="1" data-bbox="552 909 1011 1028"><tr><td></td><td></td><td></td></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> <p>Fill each row with 126</p>													<p>Children can represent their work with place value counters in a way that they understand.</p> <p>They can draw the counters using colours to show different amounts or just use the circles in the different columns to show their thinking as shown below.</p> <p>Bar model are used to explore missing numbers</p> $4 \times \underline{\hspace{1cm}} = 20$ 	<p>Start with multiplying by one digit numbers and showing the clear addition alongside the grid.</p> <table border="1" data-bbox="1694 442 2030 612"><tr><td>x</td><td>30</td><td>5</td></tr><tr><td>7</td><td>210</td><td>35</td></tr><tr><td colspan="2"></td><td>210 + 35 = 245</td></tr></table> <p>Moving forward, multiply by a 2 digit number showing the different rows within the grid method.</p> 	x	30	5	7	210	35			210 + 35 = 245
x	30	5																						
7	210	35																						
		210 + 35 = 245																						

# Y4 MULTIPLICATION

Objective & Strategy	Concrete	Pictorial	Abstract
<p>Grid method recap from year 3 for 2 digits x 1 digit</p> <p>Move to multiplying 3 digit numbers by 1 digit. (year 4 expectation)</p>	<p>Use 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>Fill each row with 126</p>  <p>Add up each column making any exchanges needed</p> 	<p>Children can represent their work with place value counters in a way that they understand.</p> <p>They can draw the counters using colours to show different amounts or just use the circles in the different columns to show their thinking as shown below.</p>	<p>Start with multiplying by one digit numbers and showing the clear addition alongside the grid.</p> 
Column multiplication	<p>Children can continue to be supported by place value counters at the stage of multiplication. This initially done where there is no regrouping. <math>327 \times 4 = 1308</math></p>  <p>It is important at this stage that they always multiply the ones first.</p> <p>The corresponding long multiplication is modelled alongside</p>	 <p>The grid method may be used to show how this relates to a formal written method.</p>  <p>Bar modelling and number lines can support learners when solving problems with multiplication alongside the formal written methods.</p>	 <p>This may lead to a compact method.</p>

# Y5-6

# MULTIPLICATION

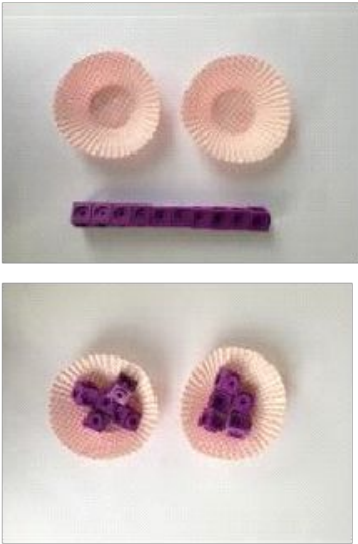
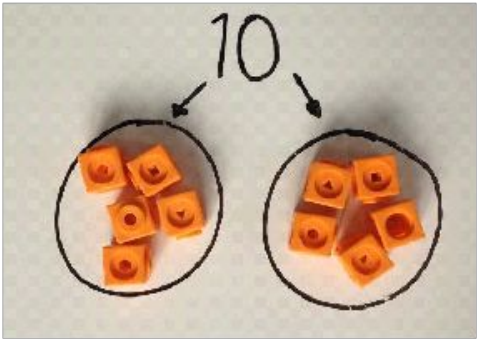
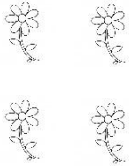
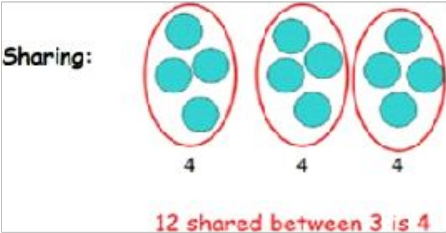
Objective & Strategy	Concrete	Pictorial	Abstract								
Column Multiplication for 3 and 4 digits x 1 digit.	 <p>It is important at this stage that they always multiply the ones first.</p> <p>Children can continue to be supported by place value counters at the stage of multiplication. This initially done where there is no regrouping. <math>321 \times 2 = 642</math></p>	<table border="1" data-bbox="1131 348 1472 429"> <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	$\begin{array}{r} 327 \\ \times 4 \\ \hline 28 \\ 80 \\ 1200 \\ \hline 1308 \end{array}$  $\begin{array}{r} 327 \\ \times 4 \\ \hline 1308 \\ \hline 12 \end{array}$ <p>This will lead to a compact method.</p>
x	300	20	7								
4	1200	80	28								
Column multiplication	Manipulatives may still be used with the corresponding long multiplication modelled alongside.		$\begin{array}{r} 18 \\ \times 13 \\ \hline 54 \\ 180 \\ \hline 234 \end{array}$ <p>18 x 3 on the first row (8x3 = 24 carrying the 2 for 20 then 1 x 3)</p> $\begin{array}{r} 1234 \\ \times 16 \\ \hline 7404 \\ 12340 \\ \hline 19744 \end{array}$ <p>18 x 10 on the 2<sup>nd</sup> row Show multiplying by 10 by putting a zero in the units first</p>								

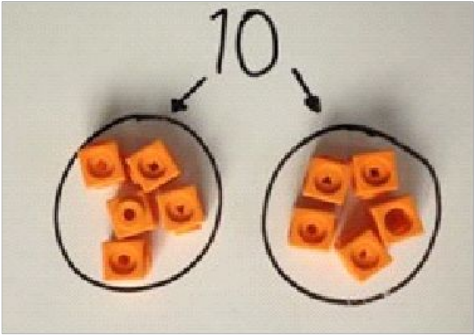
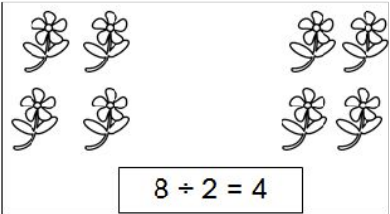
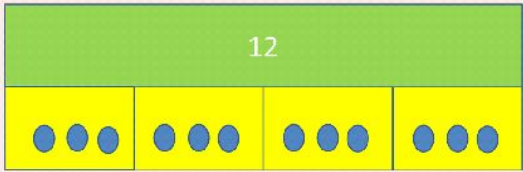
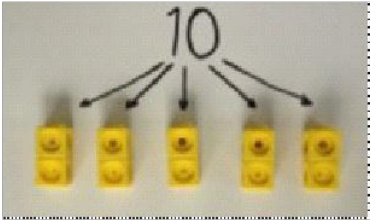
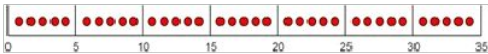
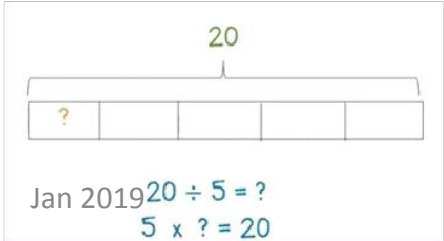
# Y5-6

# MULTIPLICATION

Objective & Strategy	Concrete	Pictorial	Abstract
<p>Multiplying decimals up to 2 decimal places by a single digit.</p>			<p>Remind children that the single digit belongs in the units column. Line up the decimal points in the question and the answer.</p> <div data-bbox="1656 414 2012 664"> <math display="block">\begin{array}{r} 3.19 \\ \times 8 \\ \hline 25.52 \end{array}</math> </div>

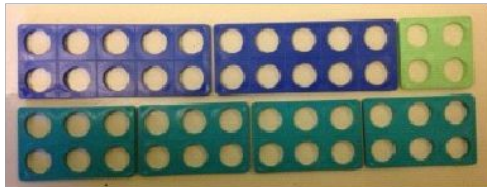
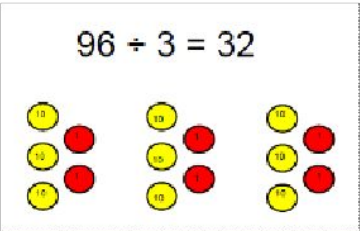
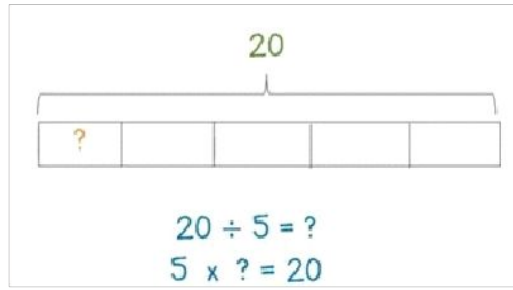
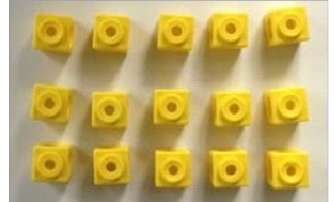
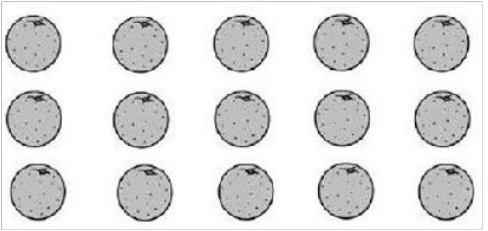


Objective & Strategy	Concrete	Pictorial	Abstract
<p>Division as sharing</p> <p>Use Gordon ITPs for modelling</p>	  <p>I have 10 cubes, can you share them equally in 2 groups?</p>	<p>Children use pictures or shapes to share quantities.</p>  <p>8 shared between 2 is 4</p> 	<p>12 shared between 3 is</p> <p>4</p>

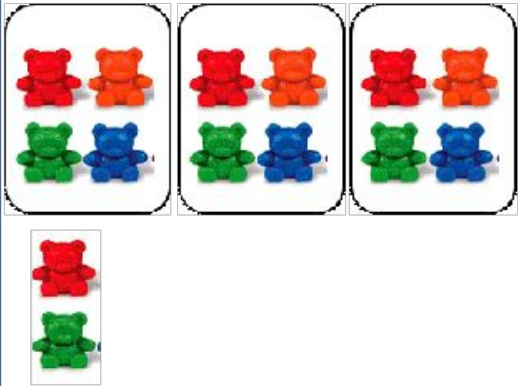
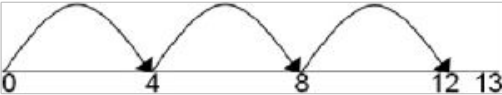

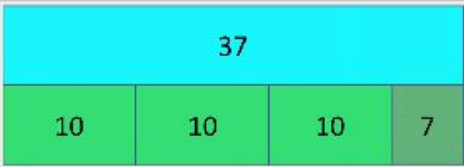

Objective & Strategy	Concrete	Pictorial	Abstract
Division as sharing	 <p>I have 10 cubes, can you share them equally in 2 groups?</p>	<p>Children use pictures or shapes to share quantities.</p>  <p><math>8 \div 2 = 4</math></p> <p>Children use bar modelling to show and support understanding.</p>  <p><math>12 \div 4 = 3</math></p>	<p><math>12 \div 3 = 4</math></p>
Division as grouping	<p>Divide quantities into equal groups.</p> <p>Use cubes, counters, objects or place value counters to aid understanding.</p>  	<p>Use number lines for grouping</p> <p>Think of the bar as a whole. Split it into the number of groups you are dividing by and work out how many would be within each group.</p>  <p>Jan 2019 <math>20 \div 5 = ?</math>  <math>5 \times ? = 20</math></p>	<p><math>28 \div 7 = 4</math></p> <p>Divide 28 into 7 groups. How many are in each group?</p>

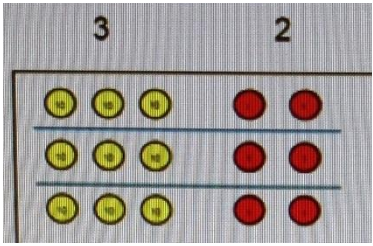
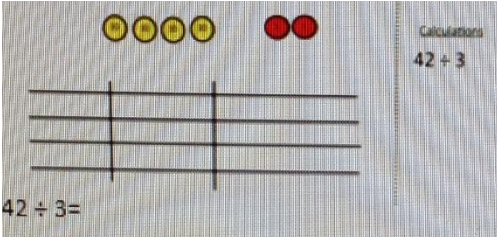
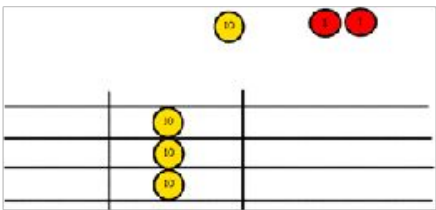
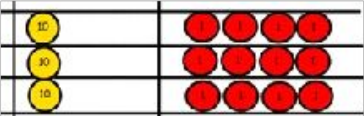
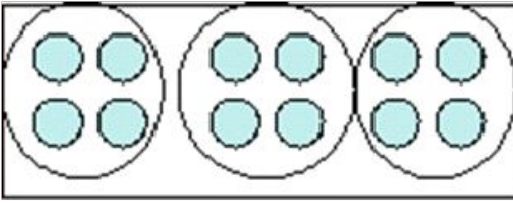
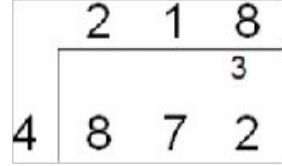
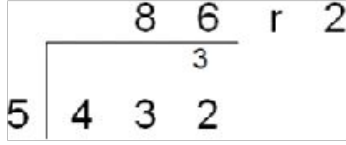
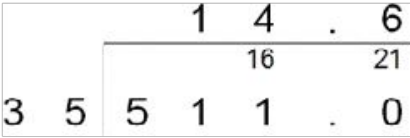
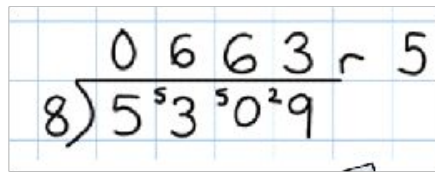
# Y3

# DIVISION ÷

Objective & Strategy	Concrete	Pictorial	Abstract
Division as grouping	<p>Use cubes, counters, objects or place value counters to aid understanding.</p>  <p>24 divided into groups of 6 = 4</p>  <p><math>96 \div 3 = 32</math></p>	<p>Continue to use bar modelling to aid solving division problems.</p>  <p><math>20 \div 5 = ?</math>  <math>5 \times ? = 20</math></p>	<p>How many groups of 6 in 24?</p> <p><math>24 \div 6 = 4</math></p>
Division with arrays	 <p>Link division to multiplication by creating an array and thinking about the number sentences that can be created.</p> <p>Eg <math>15 \div 3 = 5</math>    <math>5 \times 3 = 15</math>  <math>15 \div 5 = 3</math>    <math>3 \times 5 = 15</math></p>	<p>Draw an array and use lines to split the array into groups to make multiplication and division sentences</p>  <p>Jan 2019</p>	<p>Find the inverse of multiplication and division sentences by creating eight linking number sentences.</p> <p><math>7 \times 4 = 28</math>  <math>4 \times 7 = 28</math>  <math>28 \div 7 = 4</math>  <math>28 \div 4 = 7</math>  <math>28 = 7 \times 4</math>  <math>28 = 4 \times 7</math>  <math>4 = 28 \div 7</math>  <math>7 = 28 \div 4</math></p>



Objective & Strategy	Concrete	Pictorial	Abstract
<p>Division with remainders.</p>	<p><math>14 \div 3 =</math></p> <p>Divide objects between groups and see how much is left over</p> 	<p>Jump forward in equal jumps on a number line then see how many more you need to jump to find a remainder.</p>  <p>Draw dots and group them to divide an amount and clearly show a remainder.</p>  <p>Use bar models to show division with remainders.</p> 	<p>Complete written divisions and show the remainder using r.</p> 

Objective & Strategy	Concrete	Pictorial	Abstract
<p>Divide at least 3 digit numbers by 1 digit.</p> <p>Short Division</p>	<p><math>96 \div 3</math></p>  <p>Use place value counters to divide using the bus stop method alongside</p>  <p><math>42 \div 3 =</math></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>Students can continue to use drawn diagrams with dots or circles to help them divide numbers into equal groups.</p>  <p>Encourage them to move towards counting in multiples to divide more efficiently.</p>	<p>Begin with divisions that divide equally with no remainder.</p>  <p>Move onto divisions with a remainder.</p>  <p>Finally move into decimal places to divide the total accurately.</p>  

# Long Division

Y4-6

DIVISION ÷

1. Divide.	2. Multiply & subtract.	3. Drop down the next digit.
$\begin{array}{r} \text{h t o} \\ 1 \\ 2 \overline{) 278} \end{array}$ <p>Two goes into 2 one time, or 2 hundreds ÷ 2 = 1 hundred.</p>	$\begin{array}{r} \text{h t o} \\ 1 \\ 2 \overline{) 278} \\ -2 \\ \hline 0 \end{array}$ <p>Multiply <math>1 \times 2 = 2</math>, write that 2 under the two, and subtract to find the remainder of zero.</p>	$\begin{array}{r} \text{h t o} \\ 18 \\ 2 \overline{) 278} \\ -2 \downarrow \\ \hline 07 \end{array}$ <p>Next, drop down the 7 of the tens next to the zero.</p>
Divide.	Multiply & subtract.	Drop down the next digit.
$\begin{array}{r} \text{h t o} \\ 13 \\ 2 \overline{) 278} \\ -2 \\ \hline 07 \end{array}$ <p>Divide 2 into 7. Place 3 into the quotient.</p>	$\begin{array}{r} \text{h t o} \\ 13 \\ 2 \overline{) 278} \\ -2 \\ \hline 07 \\ -6 \\ \hline 1 \end{array}$ <p>Multiply <math>3 \times 2 = 6</math>, write that 6 under the 7, and subtract to find the remainder of 1 ten.</p>	$\begin{array}{r} \text{h t o} \\ 13 \\ 2 \overline{) 278} \\ -2 \\ \hline 07 \\ -6 \\ \hline 18 \end{array}$ <p>Next, drop down the 8 of the ones next to the 1 leftover ten.</p>
1. Divide.	2. Multiply & subtract.	3. Drop down the next digit.
$\begin{array}{r} \text{h t o} \\ 139 \\ 2 \overline{) 278} \\ -2 \\ \hline 07 \\ -6 \\ \hline 18 \end{array}$ <p>Divide 2 into 18. Place 9 into the quotient.</p>	$\begin{array}{r} \text{h t o} \\ 139 \\ 2 \overline{) 278} \\ -2 \\ \hline 07 \\ -6 \\ \hline 18 \\ -18 \\ \hline 0 \end{array}$ <p>Multiply <math>9 \times 2 = 18</math>, write that 18 under the 18, and subtract to find the remainder of zero.</p>	$\begin{array}{r} \text{h t o} \\ 139 \\ 2 \overline{) 278} \\ -2 \\ \hline 07 \\ -6 \\ \hline 18 \\ -18 \\ \hline 0 \end{array}$ <p>There are no more digits to drop down. The quotient is 139.</p>