

Aqueduct Primary School Maths Calculation Policy

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. This is particularly important as we progress through our Teaching for Mastery journey. Different variations have been included to provide teachers with a range of tools to support pupils in their grasp of number and calculation. To ensure consistency for pupils, it is important that that the mathematical language used in maths lessons reflects the vocabulary used throughout this policy.

Our Strapline

Building tomorrow, Leading the way.

Our Values

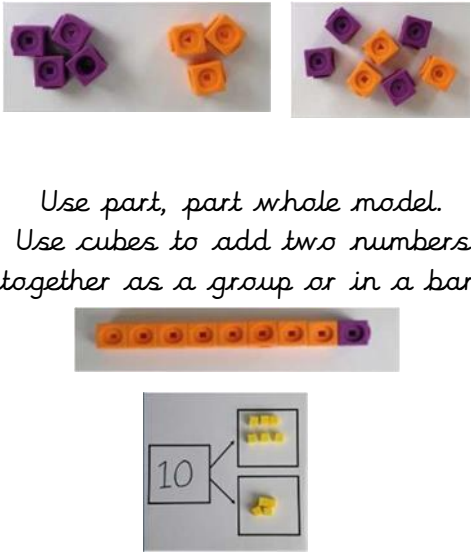
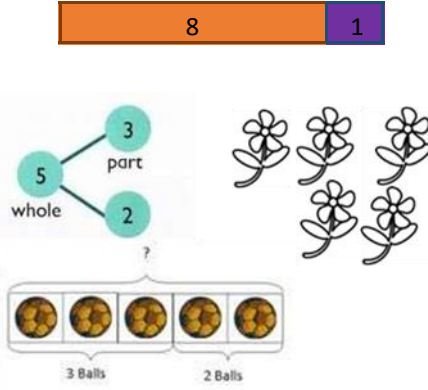
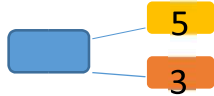
Positivity, happiness, learning, kindness, safety & respect.

AdditionYear 1Year 2Year 3Year 4+**Multiplication**Year 1Year 2Year 3Year 4+**Subtraction**Year 1Year 2Year 3Year 4+**Division**Year 1Year 2Year 3Year 4+


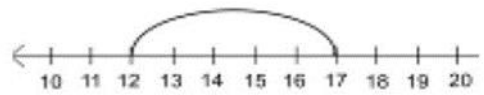



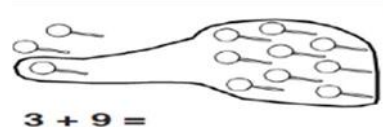
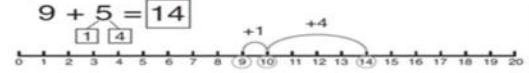
Addition

+


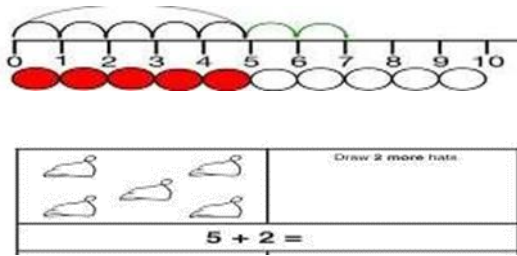
Addition
Year 1


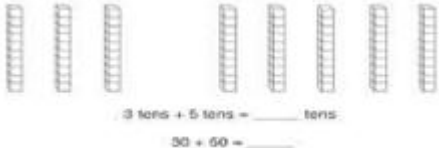
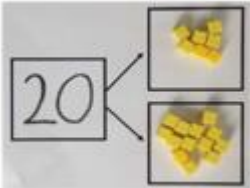
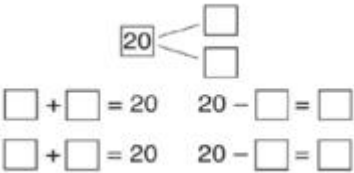
Objective / Strategy	Concrete	Pictorial	Abstract
<p>Combining two parts to make a whole: part-whole model</p>	 <p>Use part, part whole model. Use cubes to add two numbers together as a group or in a bar.</p>	<p>Use pictures to add two numbers together as a group or in a bar.</p> 	<p>$8 = 5 + 3$ $5 + 3 = 8$</p>  <p>Use the part-part-whole diagram as shown above to move into the abstract.</p> <p>Include missing number questions to support varied fluency:</p> <p>$8 = ? + 3$ $5 + ? = 8$</p>

*Addition
Year 1*

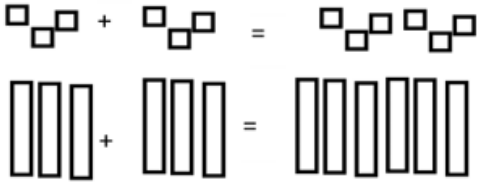
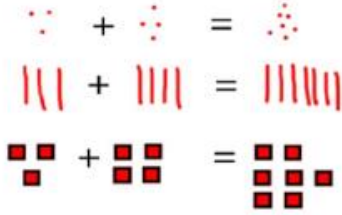


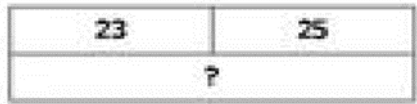
Objective / Strategy	Concrete	Pictorial	Abstract
Starting at the bigger number and counting on	 <p>Start with the larger number on the bead string and then count on to the smaller number 1 by 1 to find the answer.</p>	 <p style="text-align: center;">$12 + 5 = 17$</p> <p>Start at the larger number on the number line and count on in ones or in one jump to find the answer.</p>	<p>$5 + 12 = 17$</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 style="text-align: right;">$6 + 5 = 11$</p>  <p>Start with the bigger number and use the smaller number to make 10.</p>  <p style="text-align: right;">Use ten frames.</p>  <p style="text-align: right;">Use Rekenreks.</p>	 <p style="text-align: center;">$3 + 9 =$</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>$7 + 4 = 11$</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>

Addition
Year 1

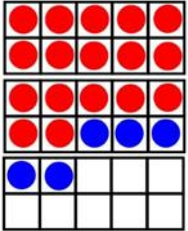
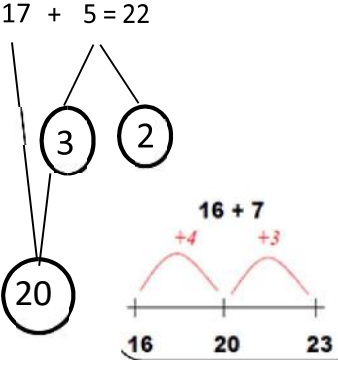

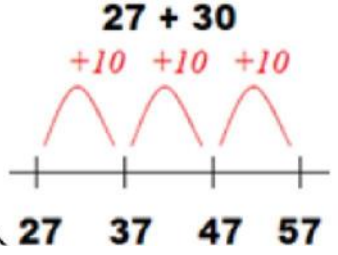
Objective / Strategy	Concrete	Pictorial	Abstract
<p>Represent & use number bonds and related subtraction facts within 20</p>	 <p>2 more than 5.</p>		<p>Include missing number questions:</p> <p>$8 = ? + 3$ $5 + ? = 8$</p> <p>Emphasis should be on the language '1 more than 5 is equal to 6.' '2 more than 5 is 7.' '8 is 3 more than 5.'</p>

Addition Year 2			
Objective / Strategy	Concrete	Pictorial	Abstract
Adding multiples of ten.	<p>$50 = 30 + 20$</p>  <p>Model using dienes and bead strings.</p>	<p>Use representations for base ten.</p>  <p>3 tens + 5 tens = _____ tens 30 + 50 = _____</p>	<p>$20 + 30 = 50$ $70 = 50 + 20$ $40 + _ = 60$</p>
Use known number facts. Part-part-whole	 <p>Children explore ways of making numbers within 20.</p>	 <p>$\square + \square = 20$ $20 - \square = \square$ $\square + \square = 20$ $20 - \square = \square$</p>	<p>Explore commutativity of addition by swapping addends to build a fact family. Explore the concept of the inverse relationship of addition and subtraction and use this to check calculations,</p> <p>$\square + 1 = 16$ $16 - 1 = \square$ $1 + \square = 16$ $16 - \square = 1$</p>


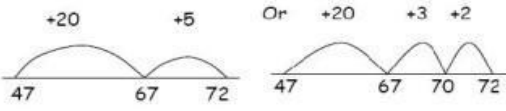
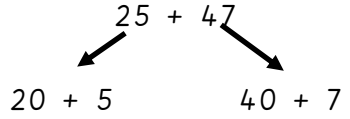


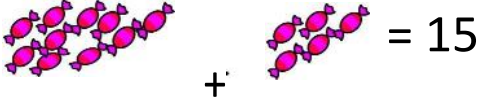
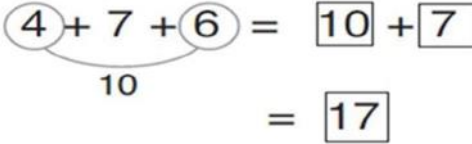
Addition
Year 2

Objective / Strategy	Concrete	Pictorial	Abstract
Using known facts.	 <p>Concrete representations of addition using small squares and vertical bars.</p>	 <p>Children draw representations of H,T and O</p>	<p>$3 + 4 = 7$</p> <p>Leads to</p> <p>$30 + 40 = 70$</p> <p>Leads to</p> <p>$300 + 400 = 700$</p>
Bar Model	 <p>$3 + 4 = 7$</p>	 <p>$7 + 3 = 10$</p>	 <p>$23 + 25 = 48$</p>

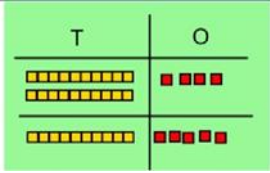

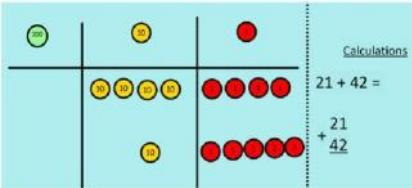
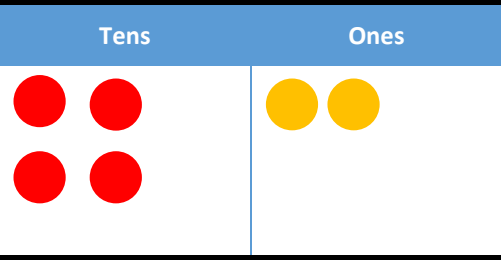
**Addition
Year 2**

Objective / Strategy	Concrete	Pictorial	Abstract				
<p>Add a two-digit number and ones</p>	<p>$17 + 5 = 22$</p> <p>Use tens frames to make ten.</p> <p>Children explore patterns.</p> <p>$17 + 5 = 22$ $27 + 5 = 32$</p> 	<p>$17 + 5 = 22$</p>  <p>Use part-part whole and number line to model. Other variations of the above accepted.</p>	<p>$17 + 5 = 22$</p> <p>Explore related facts.</p> <p>$17 + 5 = 22$ $5 + 17 = 22$ $22 - 17 = 5$ $22 - 5 = 17$</p> <table border="1" data-bbox="1836 422 2116 574"> <tr> <td>22</td> <td></td> </tr> <tr> <td>17</td> <td>5</td> </tr> </table> <p>Lead into recording in column format to reinforce place value and prepare children for formal written methods with larger values</p>	22		17	5
22							
17	5						
<p>Add a two-digit number and tens</p>	 <p>$25 + 10 = 35$</p> <p>Explore that the ones digit does not change.</p>	<p>$27 + 30$</p> 	<p>$27 + 10 = 37$</p> <p>$27 + 20 = 47$</p> <p>$27 + \underline{\quad} = 57$</p>				

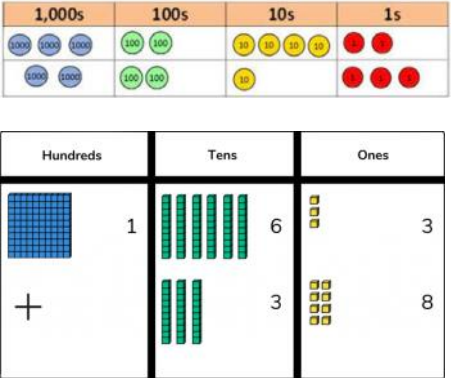
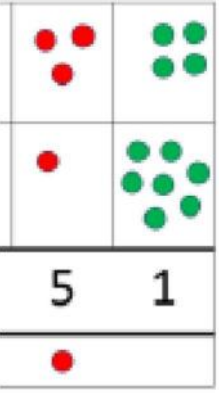
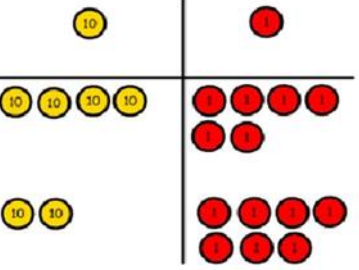
**Addition
Year 2**

Objective / Strategy	Concrete	Pictorial	Abstract
<p>Add two two-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>	 $20 + 5 \qquad 40 + 7$ $20 + 40 = 60$ $5 + 7 = 12$ $60 + 12 = 72$
			<p>Lead into recording in column format, to reinforce place value and prepare children for formal written methods with larger values.</p>
<p>Add three one-digit numbers</p>	 <p>Combine to make 10 first if possible or bridge 10 then add third digit.</p>	 <p>Regroup and draw representation.</p> 	 <p>Combine the two numbers that make/bridge ten then add on the third.</p>



**Addition
Year 3**

Objective / Strategy	Concrete	Pictorial	Abstract
<p>Column addition (No regrouping)</p> <p>Add two or three two or three-digit numbers.</p>	<p>Using dienes.</p>  <p>Add together the ones first, then the tens.</p>   <p>Move to using place value counters either alongside or afterwards.</p>	<p>Children move to drawing the counters using a place value frame or using equivalent practical equipment.</p>  <p>Other objects and equipment may be used to reinforce objective.</p>	<p>$237 + 114 =$</p> $\begin{array}{r} 237 \\ + 114 \\ \hline \end{array}$ <p>Add the ones (or equivalent smallest place value) first, then the tens, then the hundreds.</p>

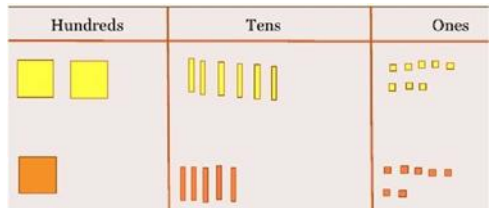
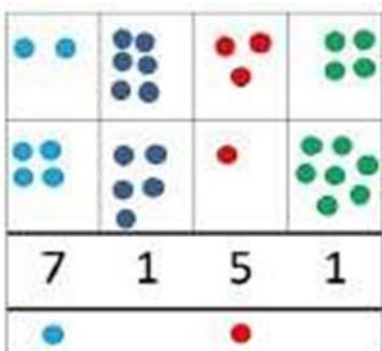
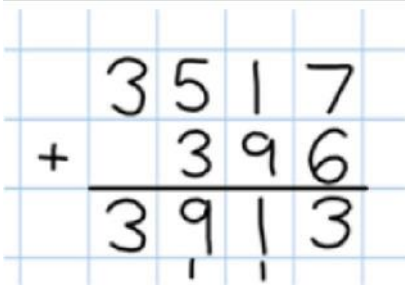
Addition
Year 3

Objective / Strategy	Concrete	Pictorial	Abstract
<p>Column addition with regrouping.</p>	 <p style="text-align: center;"><i>Exchange ten ones for a ten. Model using place value counters and dienes.</i></p>	<p>Children can draw a representation of the grid to further support their understanding, carrying the ten underneath</p> 	$ \begin{array}{r} 20 + 5 \\ 40 + 8 \\ \hline 60 + 13 = 73 \end{array} $ $ \begin{array}{r} 536 \\ + 85 \\ \hline 621 \\ 11 \end{array} $ <p style="text-align: center;"><i>Start by partitioning the numbers before formal column to show the exchange.</i></p>
	 <p style="text-align: center;">$46 + 27 = 73$</p>		

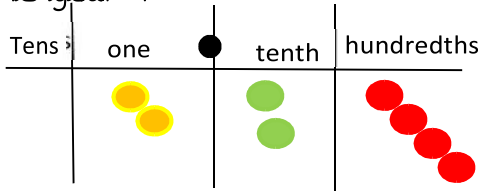
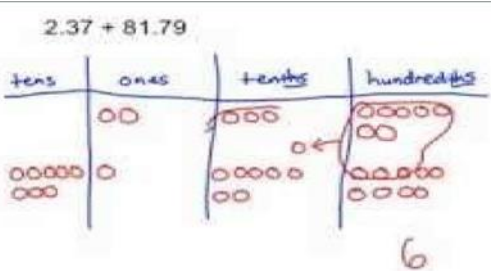
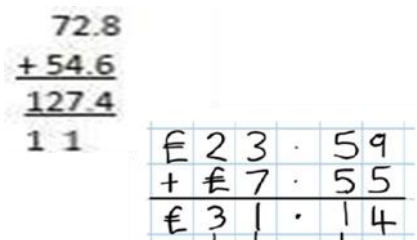
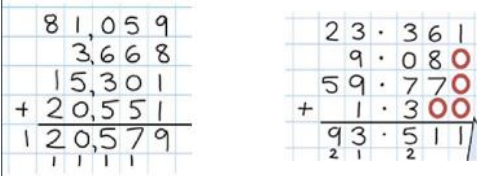
Addition
Year 3

Objective / Strategy	Concrete	Pictorial	Abstract
<p>Estimate the answers to questions and use inverse operations to check answers</p>	 <p>Estimating $98 + 17 = ?$</p> <p>$100 + 20 = 120$</p>	<p>Use number lines to illustrate estimation.</p> 	<p>Building up known facts and using them to illustrate the inverse and to check answers.</p> <p>$98 + 18 = 116$ $116 - 18 = 98$</p> <p>$18 + 98 = 116$ $116 - 98 = 18$</p>

Addition
Year 4-6

Objective / Strategy	Concrete	Pictorial	Abstract
<p>Estimate and use inverse operations to check answers to a calculation</p>	<p>As per Year 3</p>		
<p>Y4—Add numbers with up to 4-digits</p>	<p>Children continue to use dienes or place value 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 place value grid.</p> 	<p>Continue from previous work to carry hundreds as well as tens. Relate to money and measures.</p> 



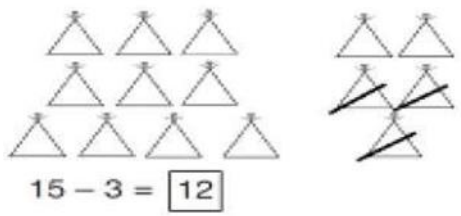



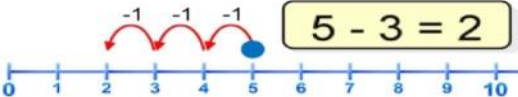
Addition
Year 4-6

Objective / Strategy	Concrete	Pictorial	Abstract
<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>		 <p>Decimal place to be laid out in its own square to ensure clarity.</p>
<p>Y6—add several numbers of increasing complexity, including adding money, measure and decimals with different numbers of decimal points.</p>	<p>As per Year 5</p>	<p>As per Year 5</p>	<p>Insert 0 for place holders.</p> 

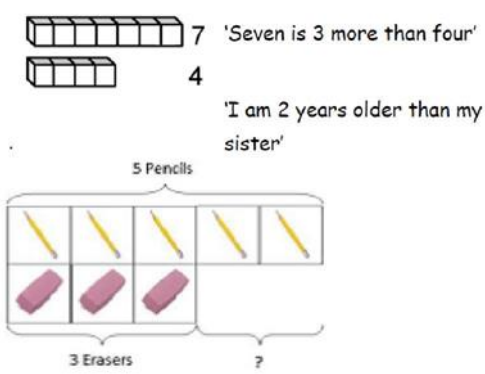
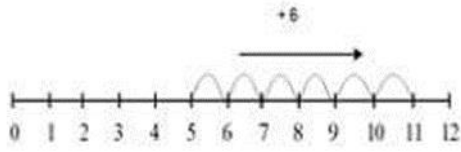
Subtraction

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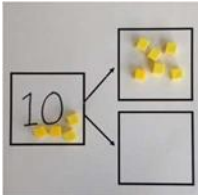
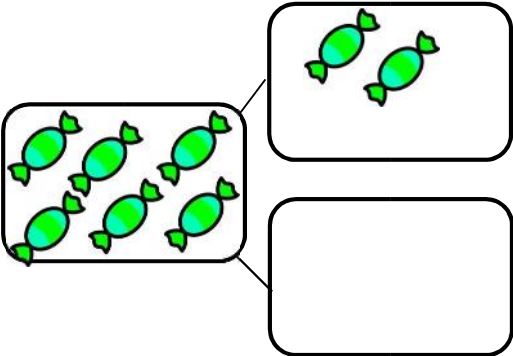
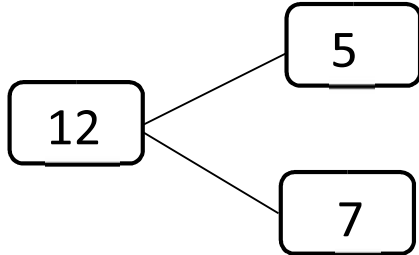
Subtraction
Year 1

Objective / Strategy	Concrete	Pictorial	Abstract
<p>Taking away ones.</p>	<p>Use physical objects, counters, cubes etc. to show how objects can be taken away.</p> <p style="text-align: center;">$4 - 2 = 2$</p>  <p style="text-align: center;">$6 - 4 = 2$</p> 	<p>Cross out drawn objects to show what has been taken away.</p>  <p>Stories will also be used to represent subtraction in different contexts.</p>	<p style="text-align: center;">$7 - 4 = 3$ $16 - 9 = 7$</p>
<p>Counting back</p>	 <p>Move objects away from the group, counting backwards.</p> <p>Move the beads along the bead string as you count backwards.</p>  <p>Use of Rekenreks.</p> 	<p>Count back in ones using a number line.</p> 	<p>Put 13 in your head, count back 4. What number are you at?</p>

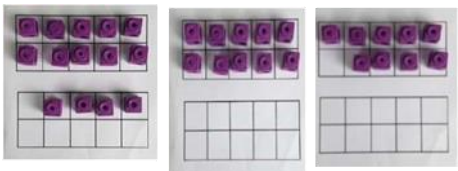
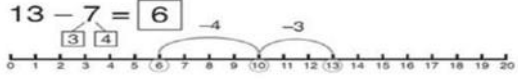
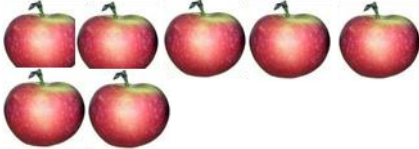

Subtraction
Year 1

Objective / Strategy	Concrete	Pictorial	Abstract
<p>Find the Difference</p>	<p>Compare objects and amounts</p>  <p>7 'Seven is 3 more than four' 4 'I am 2 years older than my sister' 5 Pencils 3 Erasers ?</p> <p>Lay objects to represent bar model.</p>	<p>Count on using a number line to find the difference.</p> 	<p>Hannah has 2 sweets and her sister has 5. How many more does Hannah have than her sister.?</p>

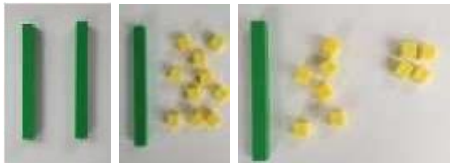
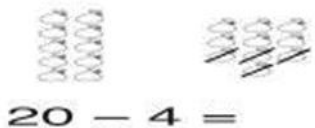

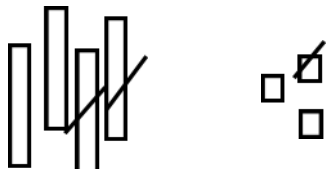

Subtraction
Year 1

Objective / Strategy	Concrete	Pictorial	Abstract
<p>Represent and use number bonds and related subtraction facts within 20</p> <p>Include subtracting zero</p> <p><i>Part Part Whole model</i></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>Include missing number problems:</p> $12 - ? = 5$ $7 = 12 - ?$

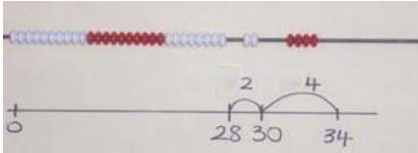
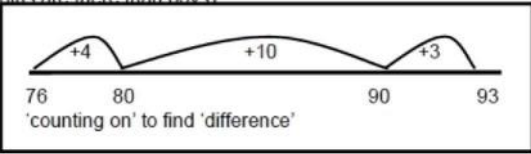
Subtraction
Year 1

Objective / Strategy	Concrete	Pictorial	Abstract		
<p><i>Make 10.</i></p>	<p style="text-align: center;">$14 - 9$</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 style="text-align: center;">$13 - 7 = 6$</p>  <p style="text-align: center;">$13 - 7$</p> <p>Jump back 3 first, then another 4. Use ten as the stopping point.</p>	<p style="text-align: center;">$16 - 8$</p> <p>How many do we take off first to get to 10? How many left to take off?</p>		
<p><i>Bar model</i></p> <p><i>Including the inverse operations.</i></p>	 <p style="text-align: center;">$5 - 2 = 3$</p>		<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center; width: 50px;">8</td> <td style="text-align: center; width: 50px;">2</td> </tr> </table> <p style="text-align: center;"> $10 = 8 + 2$ $10 = 2 + 8$ $10 - 2 = 8$ $10 - 8 = 2$ </p>	8	2
8	2				

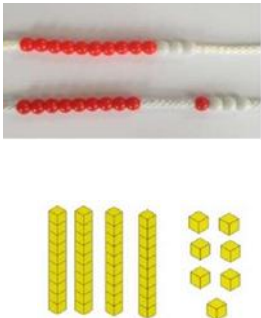

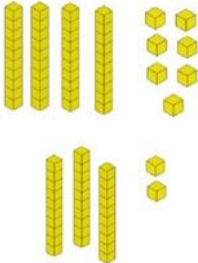
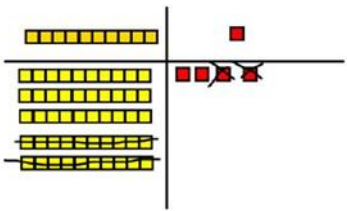
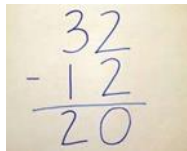
Subtraction
Year 2

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. 'Friendly numbers'	$34 - 13 = 21$ Use Dienes to show how to partition the number when subtracting without regrouping. 	Children draw representations of Dienes and cross off.  $43 - 21 = 22$ $13 - 7 =$  $13 - 3 = 10$ $10 - 4 = 6$	$43 - 21 = 22$

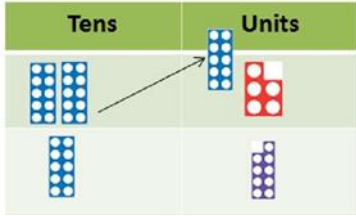
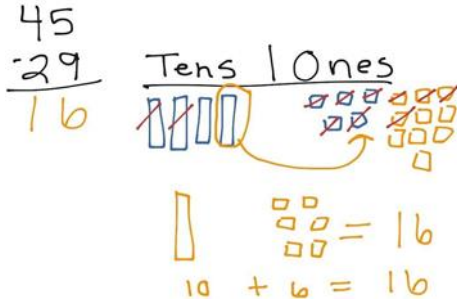
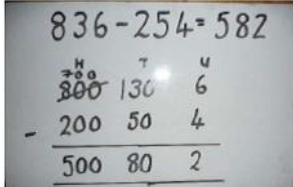
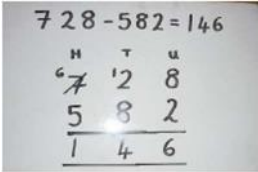
Subtraction
Year 2

Objective / Strategy	Concrete	Pictorial	Abstract
<p>Make ten strategy</p> <p>Progression should be crossing one ten, crossing more than one ten, crossing the hundreds.</p>	 <p style="text-align: center;">$34 - 28$</p> <p style="text-align: center;">Use a bead bar or bead strings to model counting to next ten and the rest.</p>	 <p style="text-align: center;">Use a number line to count on to next ten and then the rest.</p>	<p style="text-align: center;">$93 - 76 = 17$</p>

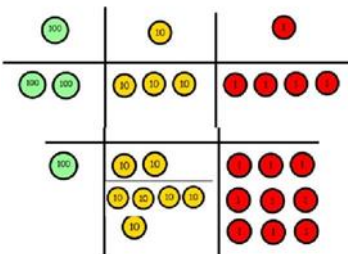
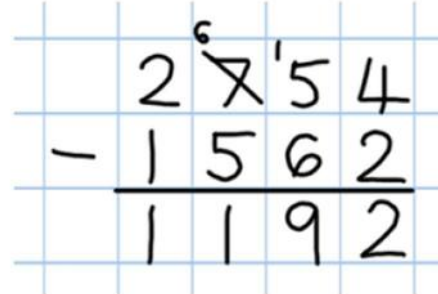
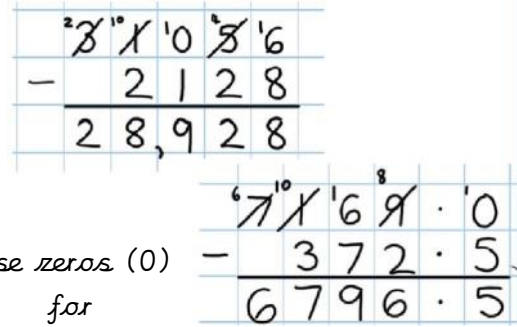
Subtraction
Year 3

Objective / Strategy	Concrete	Pictorial	Abstract
<p>Subtract numbers mentally, including:</p> <p>three digit number + ones</p> <p>three digit number + tens</p> <p>three digit number + hundreds</p>			<p>Vary the position of the answer and question.</p> <p>Expose children to missing number questions and vary the missing part of the calculation.</p> $678 = ? - 1$ $688 - 10 = ?$ $678 = ? - 100$
<p>Column subtraction without regrouping (friendly numbers)</p>	 <p style="text-align: center;">$47 - 32$</p> <p style="text-align: center;">Use base 10 or Numicon to model</p>	 <div style="border-left: 1px dashed black; padding-left: 10px; margin-left: 20px;"> <p>Calculations</p> $\begin{array}{r} 54 \\ - 22 \\ \hline 32 \end{array}$ </div> <p style="text-align: center;">Draw representations to support understanding</p>	$47 - 24 = 23$ $\begin{array}{r} 40 + 7 \\ - 20 + 4 \\ \hline 20 + 3 \end{array}$ <p style="text-align: center;">Intermediate step may be needed to lead to clear subtraction understanding.</p> 

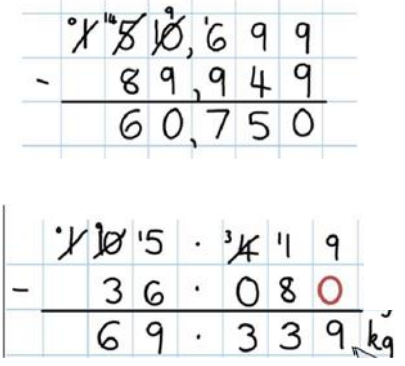
Subtraction
Year 3

Objective / Strategy	Concrete	Pictorial	Abstract
<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 'exchange' 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> 

Subtraction
Year 4-6

Objective / Strategy	Concrete	Pictorial	Abstract
<p>Subtracting tens and ones</p> <p>Year 4 - subtract with up to 4 digits.</p> <p>Introduce decimal subtraction through context of money</p>	<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 'exchange' for exchange</p>
<p>Year 5- Subtract with at least 4 digits, including money and measures.</p> <p>Subtract with decimal values, including mixtures of integers and decimals and aligning the decimal Up to 3</p>	<p>As per year 4.</p>	<p>Children to draw pv counters and show their exchange—see Y3</p>	 <p>Use zeros (0) for placeholders.</p>

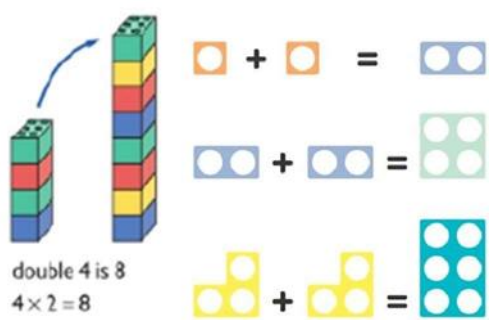

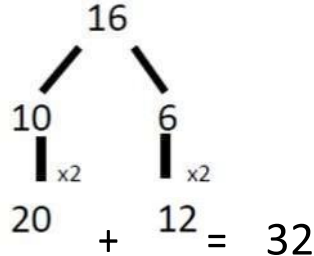
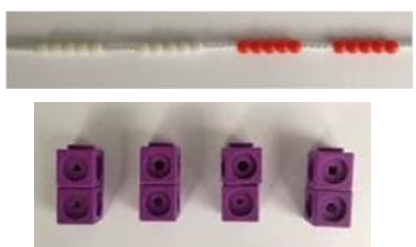
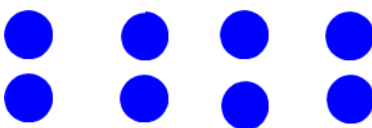
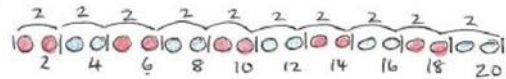
Subtraction
Year 4-6

Objective / Strategy	Concrete	Pictorial	Abstract
<p>Year 6— Subtract with increasingly large and more complex numbers and decimal values (up to 3 decimal place).</p>	<p>As per year 4.</p>	<p>Children to draw <i>pv</i> counters and show their exchange—see Y3 (If needed)</p>	 <p> $\begin{array}{r} 810,699 \\ - 89,949 \\ \hline 60,750 \end{array}$ $\begin{array}{r} 105.419 \\ - 36.080 \\ \hline 69.339 \text{ kg} \end{array}$ </p>

Multiplication

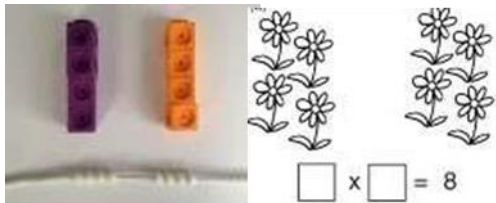

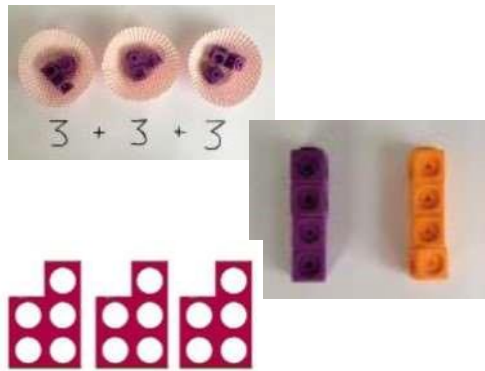
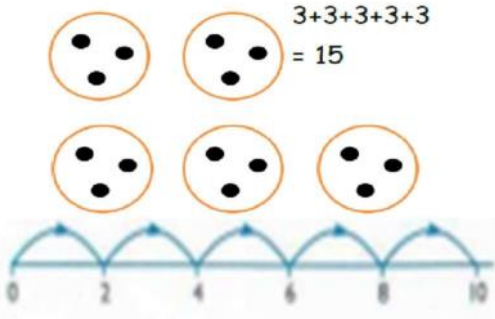

X

Multiplication
Year 1

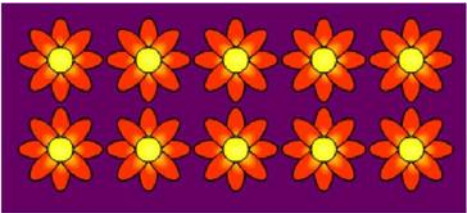
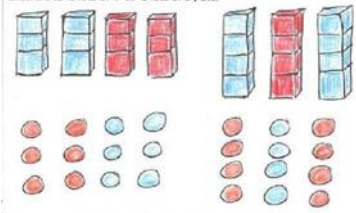
Objective / Strategy	Concrete	Pictorial	Abstract
<p>Doubling</p>	<p>Use practical activities using manipulatives including cubes and Numicon to demonstrate doubling</p> 	<p>Draw pictures to show how to double numbers</p> <p>Double 4 is 8</p> 	<p>Partition a number and then double each part before recombining it back together.</p> 
<p>Counting in multiples (2s, 5s, 10s)</p>	<p>Count the groups as children are skip counting, children may use their fingers as they are skip counting.</p> 	 <p>Children make representations to show counting in multiples.</p> 	<p>Count in multiples of a number aloud. Write sequences with multiples of numbers.</p> <p>2, 4, 6, 8, 10</p> <p>5, 10, 15, 20, 25, 30</p>

Programme of Study specifies the following objectives, however it does not require the explicit teaching of the mathematical symbol of multiplication

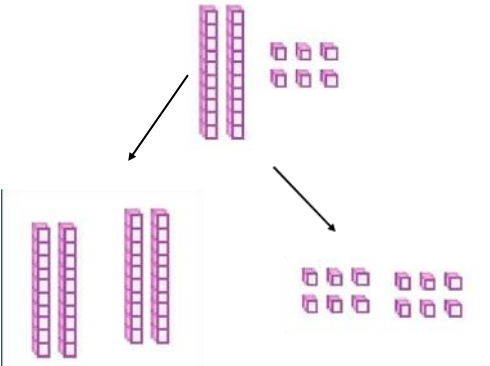
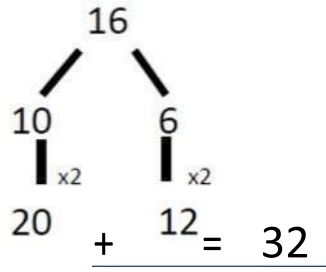
Multiplication
Year 1

Objective / Strategy	Concrete	Pictorial	Abstract
<p>Making equal groups and counting the total</p>	 <p>Use manipulatives to create equal groups.</p>	<p>Draw  to show $2 \times 3 = 6$</p> <p>Draw and make representations</p>	<p>$2 \times 4 = 8$</p>
<p>Repeated addition</p>	 <p>Use different objects to add equal groups</p>	<p>Use pictorial including number lines to solve problems.</p> <p>prob There are 3 sweets in one bag. How many sweets are in 5 bags altogether?</p> 	 <p>Write addition sentences to describe objects and pictures.</p>

Multiplication
Year 1

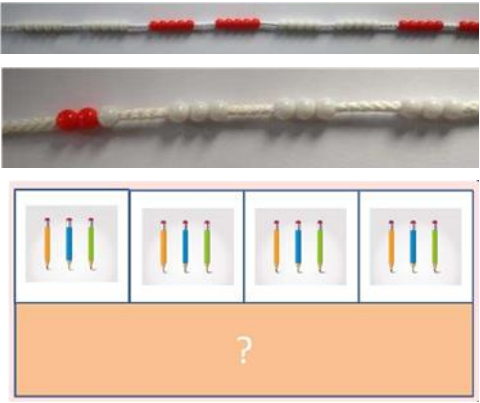
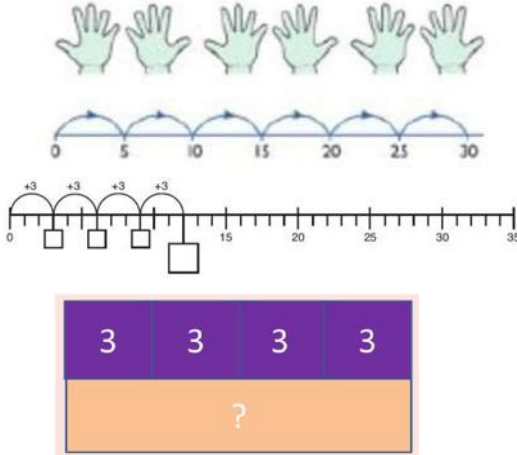
Objective / Strategy	Concrete	Pictorial	Abstract
Understanding arrays	<p>Use objects laid out in arrays to find the answers to 2 lots 5, 3 lots of 2 etc.</p> 	<p>Draw representations of arrays to show understanding</p> 	$3 \times 2 = 6$ $2 \times 5 = 10$

Multiplication
Year 2

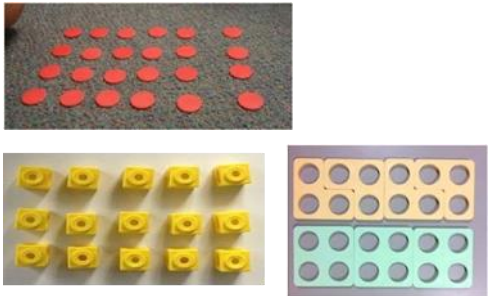
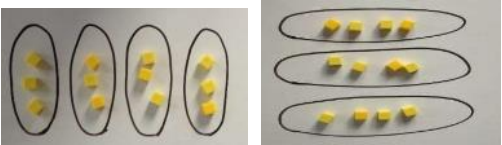
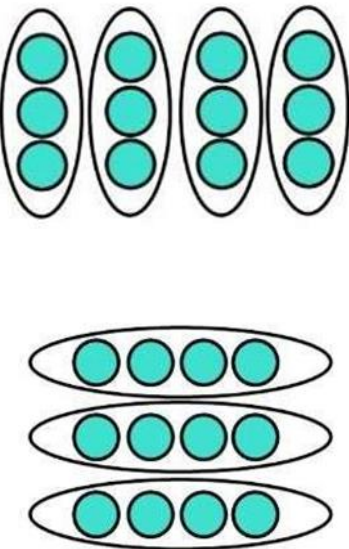

Objective / Strategy	Concrete	Pictorial	Abstract
Doubling	<p>Model doubling using dienes and PV counters.</p>  <p>$40 + 12 = 52$</p>	<p>Draw pictures and representations to show how to double numbers</p>	<p>Partition a number and then double each part before recombining it back together.</p>  <p>$20 + 12 = 32$</p>

Children should be able to recall and use multiplication and division facts for the 2, 5 and 10 times times-tables.

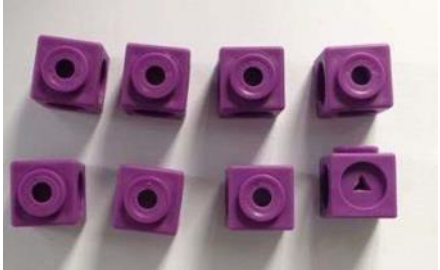
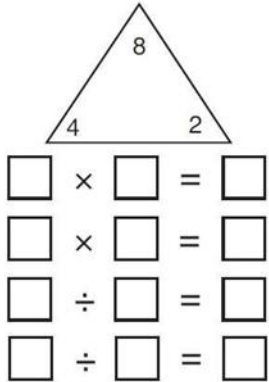
Multiplication
Year 2

Objective / Strategy	Concrete	Pictorial	Abstract
<p>Counting in multiples of 2, 3, 4, 5, 10 from 0 <i>(repeated addition)</i></p>	<p>Count the groups as children are skip counting, children may use their fingers as they are skip counting. Use bar models.</p>  <p>$5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 = 40$</p>	<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 0, 3, 6, 9, 12, 15 0, 5, 10, 15, 20, 25, 30</p> <p>$4 \times 3 = \square$</p>

Multiplication
Year 2

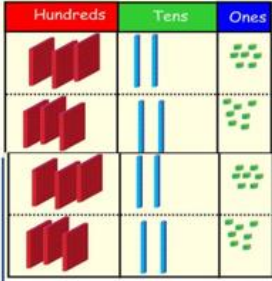
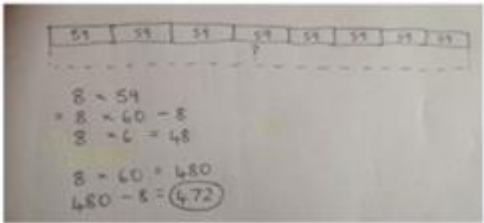
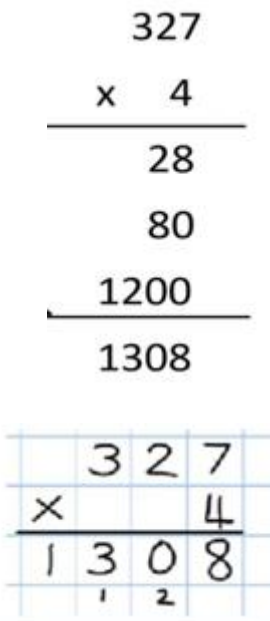
Objective / Strategy	Concrete	Pictorial	Abstract
<p>Multiplication is commutative</p>	<p>Create arrays using counters and cubes and Numicon.</p>  <p>Pupils should understand that an array can represent different equations and that, as multiplication is commutative, the order of the multiplication does not affect the answer.</p> 	<p>Use representations of arrays to show different calculations and explore commutativity.</p> 	<p>$12 = 3 \times 4$ $12 = 4 \times 3$</p> <p>Use an array to write multiplication sentences and reinforce repeated addition.</p>  <p>$5 + 5 + 5 = 15$ $3 + 3 + 3 + 3 + 3 = 15$ $5 \times 3 = 15$ $3 \times 5 = 15$</p>

Multiplication
Year 2

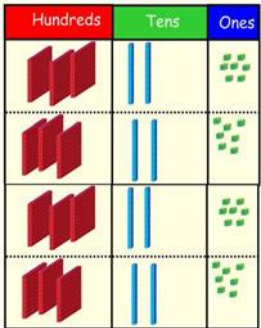
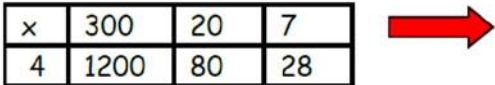
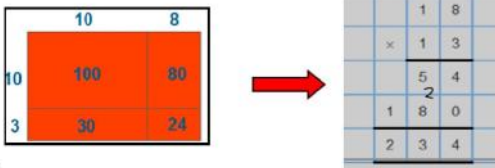
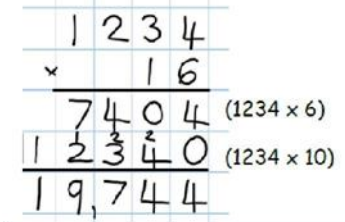
Objective / Strategy	Concrete	Pictorial	Abstract
<p>Using the Inverse</p> <p>This should be taught alongside division, so pupils learn how they work alongside each other.</p>			$2 \times 4 = 8$ $4 \times 2 = 8$ $8 \div 2 = 4$ $8 \div 4 = 2$ $8 = 2 \times 4$ $8 = 4 \times 2$ $2 = 8 \div 4$ $4 = 8 \div 2$ <p>Show all 8 related fact family sentences.</p>

Multiplication
Year 3

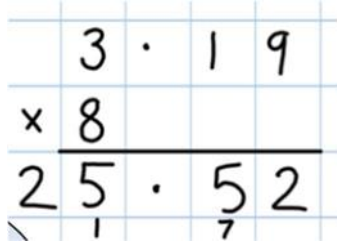
Objective / Strategy	Concrete	Pictorial	Abstract
Solve problems, including missing number problems, integer scaling problems,			<p>Three times as high, eight times as long</p> $? \times 5 = 20$ $20 \div ? = 5$ <p>3 hats and 4 coats, how many different outfits?</p>

Multiplication Year 4-6											
Objective / Strategy	Concrete	Pictorial	Abstract								
Grid method recap from year 3 for 2-digits \times 1-digit. Move to multiplying 3-digit numbers by 1-digit. (Year 4)	As per year 3.	As per year 3.	As per year 3.								
Column multiplication.	<p>Children can continue to be supported by place value counters at this stage of multiplication. This is initially done where there is no regrouping. $321 \times 2 = 642$</p>  <p>It is important at this stage that they always multiply the ones first. The corresponding long multiplication is modelled alongside.</p>	<table border="1" style="margin-left: auto; margin-right: auto;"> <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>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>	x	300	20	7	4	1200	80	28	
x	300	20	7								
4	1200	80	28								

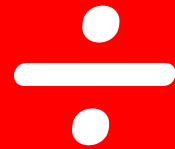
Multiplication
Year 4-6

Objective / Strategy	Concrete	Pictorial	Abstract
<p>Column Multiplication for 3 and 4 digits \times 1 digit.</p>	 <p>It is important at this stage that they always</p> <p>Multiply the ones first. Children can continue to be supported by place value counters at the stage of multiplication. This initially done where there is no regrouping. $321 \times 2 = 642$</p>		<p>As per previous.</p>
<p>Column multiplication</p>	<p>Manipulatives may still be used with the corresponding long multiplication modelled alongside.</p>		

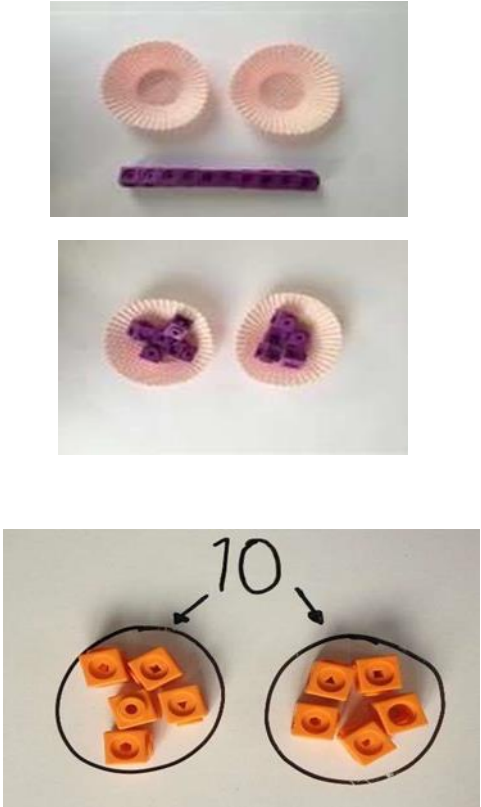
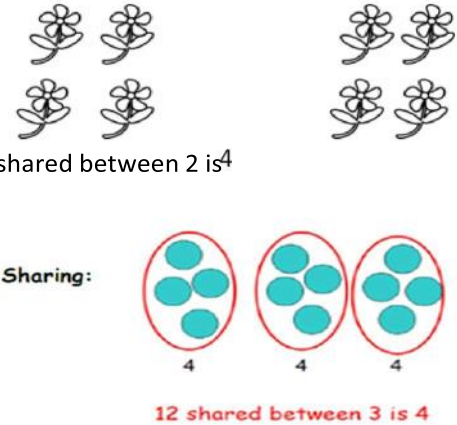
Multiplication
Year 4-6

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> 

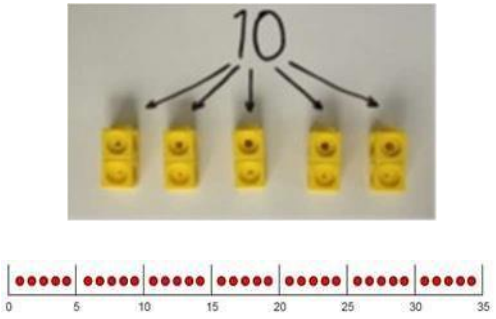
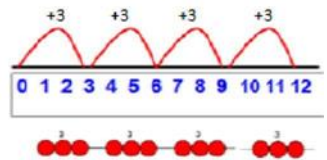
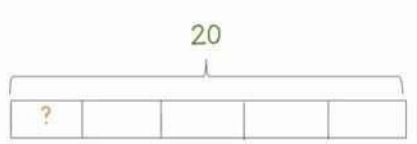
Division



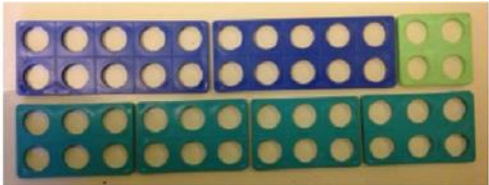
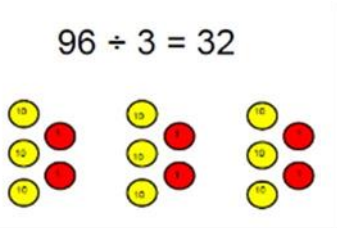


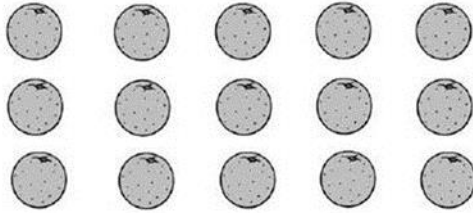
Division
Year 1

Objective / Strategy	Concrete	Pictorial	Abstract
<p>Division as sharing.</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>Sharing:</p> <p>12 shared between 3 is 4</p>	<p>12 shared between 3 is 4.</p> $12 \div 3 = 4$

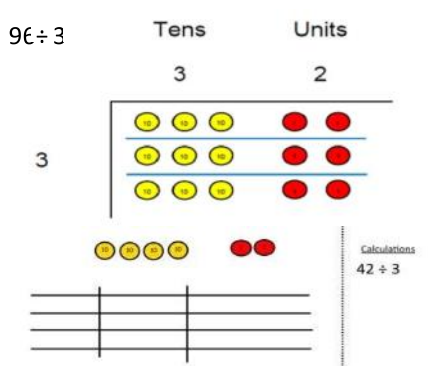
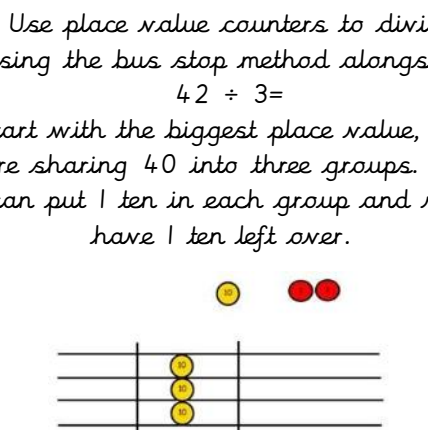
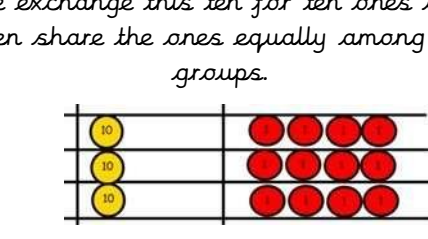
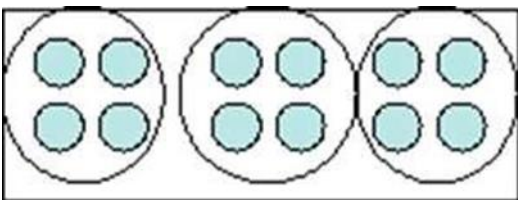
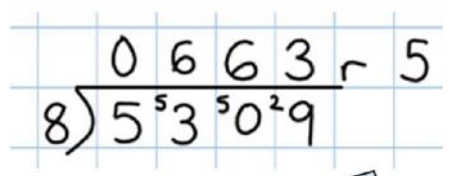
Division
Year 1

Objective / Strategy	Concrete	Pictorial	Abstract
<p>Division as grouping</p>	<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>$12 \div 3 = 4$</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>$20 \div 5 = ?$ $5 \times ? = 20$</p>	<p>$28 \div 7 = 4$</p> <p>Divide 28 into 7 groups. How many are in each group?</p>

Division
Year 2

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

Division
Year 4-6

Objective / Strategy	Concrete	Pictorial	Abstract
<p>Divide at least 3 digit numbers by 1 digit.</p> <p>Short Division</p>	<p>$96 \div 3$</p> <p>Tens Units 3 2</p>  <p>Calculations $42 \div 3 =$</p> <p>Use place value counters to divide using the bus stop method alongside $42 \div 3 =$</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> $\begin{array}{r} 218 \\ 3 \overline{) 654} \end{array}$ <p>Move onto divisions with a remainder.</p> $\begin{array}{r} 86 \text{ r } 2 \\ 3 \overline{) 258} \end{array}$ <p>Finally move into decimal places to divide the total accurately.</p> $\begin{array}{r} 14.6 \\ 35 \overline{) 511.0} \end{array}$ 

Division
Year 4-6

Objective / Strategy	Concrete	Pictorial	Abstract
Long Division Divide Multiply Subtract Bring Down			
	$25 \overline{)425}$	$4 \div 25 = 0$ remainder 4	The first digit of the dividend (4) is divided by the divisor .
	$25 \overline{)425} \begin{matrix} 0 \\ \end{matrix}$		The whole number result is placed at the top. Any remainders are ignored at this point.
	$25 \overline{)425} \begin{matrix} 0 \\ 0 \\ \hline \end{matrix}$	$25 \times 0 = 0$	The answer from the first operation is multiplied by the divisor . The result is placed under the number divided into.
	$25 \overline{)425} \begin{matrix} 0 \\ 0 \\ 4 \\ \hline \end{matrix}$	$4 - 0 = 4$	Now we subtract the bottom number from the top number.
	$25 \overline{)425} \begin{matrix} 0 \\ 0 \\ 4 \\ \hline 42 \\ \end{matrix}$		Bring down the next digit of the dividend.

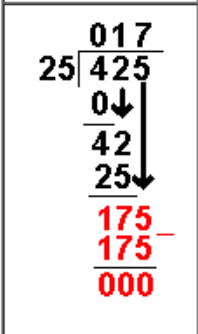
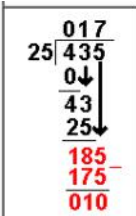
Division
Year 4-6

Objective / Strategy	Concrete	Pictorial	Abstract
Long Division Divide Multiply Subtract Bring Down	$\begin{array}{r} 0 \\ 25 \overline{)425} \\ \underline{0\downarrow} \\ 42 \end{array}$	$42 \div 25 = 1$ remainder 17	<p>Divide this number by the divisor.</p>
	$\begin{array}{r} 01 \\ 25 \overline{)425} \\ \underline{0\downarrow} \\ 42 \end{array}$		<p>The whole number result is placed at the top. Any remainders are ignored at this point.</p>
	$\begin{array}{r} 01 \\ 25 \overline{)425} \\ \underline{0\downarrow} \\ 42 \\ \underline{25} \end{array}$	$25 \times 1 = 25$	<p>The answer from the above operation is multiplied by the divisor. The result is placed under the last number divided into.</p>
	$\begin{array}{r} 01 \\ 25 \overline{)425} \\ \underline{0\downarrow} \\ 42 \\ \underline{25} \\ 17 \end{array}$	$42 - 25 = 17$	<p>Now we subtract the bottom number from the top number.</p>

Division
Year 4-6

Objective / Strategy	Concrete	Pictorial	Abstract
Long Division Divide Multiply Subtract Bring Down	$\begin{array}{r} 01 \\ 25 \overline{)425} \\ \underline{0} \\ 42 \\ \underline{25} \\ 175 \end{array}$		Bring down the next digit of the dividend.
	$\begin{array}{r} 01 \\ 25 \overline{)425} \\ \underline{0} \\ 42 \\ \underline{25} \\ 175 \end{array}$	$175 \div 25 = 7$ remainder 0	Divide this number by the divisor.
	$\begin{array}{r} 017 \\ 25 \overline{)425} \\ \underline{0} \\ 42 \\ \underline{25} \\ 175 \end{array}$		The whole number result is placed at the top. Any remainders are ignored at this point.
	$\begin{array}{r} 017 \\ 25 \overline{)425} \\ \underline{0} \\ 42 \\ \underline{25} \\ 175 \\ \underline{175} \end{array}$	$25 \times 7 = 175$	The answer from the above operation is multiplied by the divisor. The result is placed under the number divided into.

Division
Year 4-6

Objective / Strategy	Concrete	Pictorial	Abstract
<p>Long Division</p> <p>Divide</p> <p>Multiply</p> <p>Subtract</p> <p>Bring Down</p>		<p>$175 - 175 = 0$</p> <p>Now we subtract the bottom number from the top number.</p>	<p>There are no more digits to bring down. The answer must be 17</p>
<p>Long division with remainders.</p>		<p>$185 - 175 = 10$</p> <p>Now we take away the bottom number from the top number.</p>	<p>There is still 10 left over but no more numbers to bring down.</p> <p>With a long division with remainders the answer is expressed as 17 remainder 10 as shown in the diagram</p> <p>Answer: $435 \div 25 = 17 \text{ R } 10$</p>

Any value left over would be the remainder.
E.g. $435 \div 25$ where we skip to the final step.