

Eastry C.E Primary School

Maths Calculation Policy

Maths in Early Years Foundation Stage (EYFS)

At Eastry C.E Primary School, we believe that Mathematics is an important part of learning for all children in the early years and receiving a good grounding in maths is an essential life skill. We are committed to delivering a rich and varied curriculum that not only focuses on number but also supports skills such as problem solving, understanding and using shapes as well as measure and developing skills in spatial awareness.

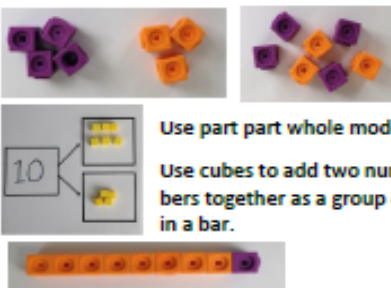
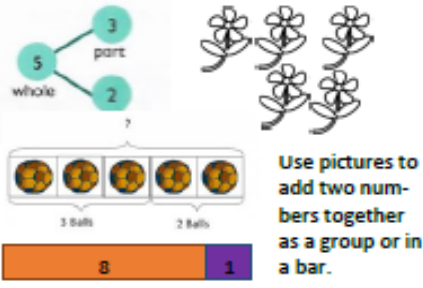
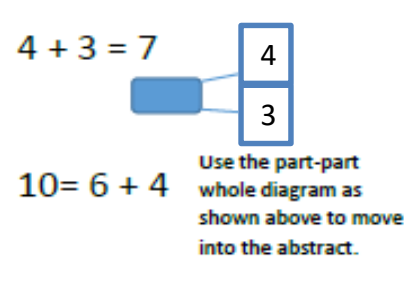
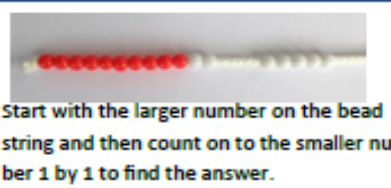
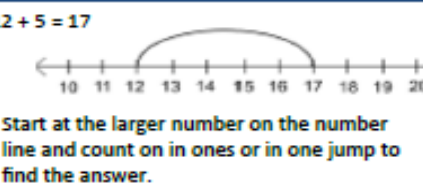
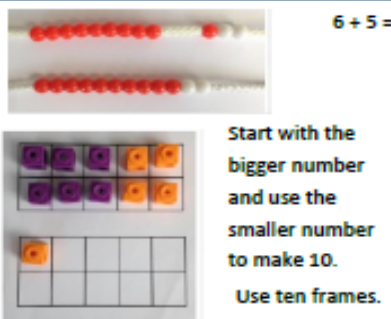
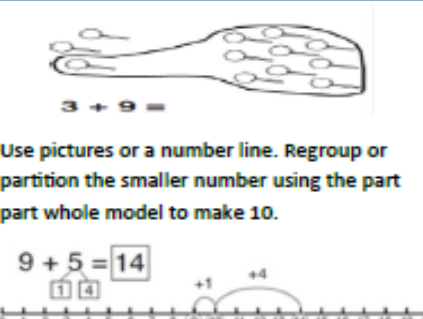

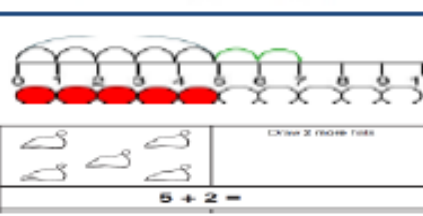
In EYFS by the end of the year, children should be able to:



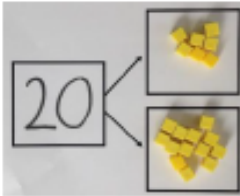

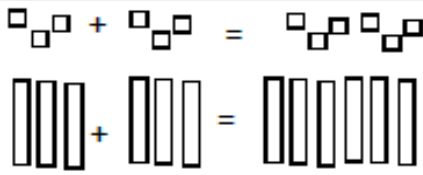



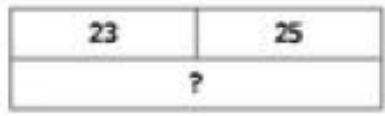
Number: count reliably with numbers from 1 to 20, place them in order and say which number is one more or one less than a given number. Using quantities and objects, they add and subtract two single-digit numbers and count on or back to find the answer. They solve problems, including doubling, halving and sharing.

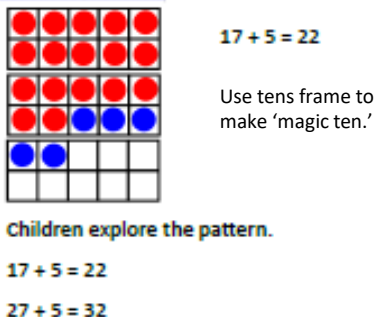
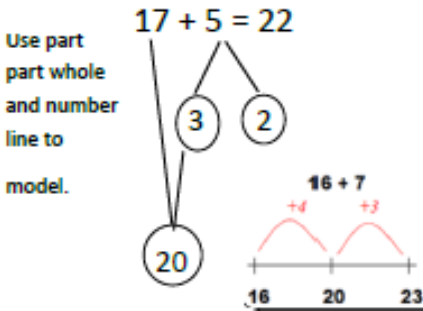
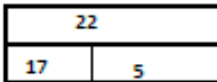

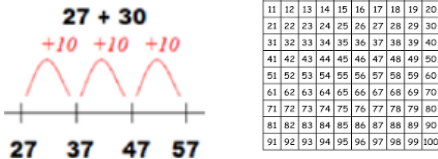

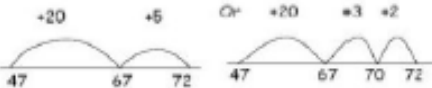
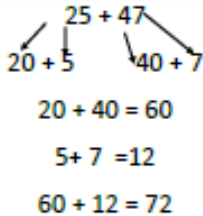

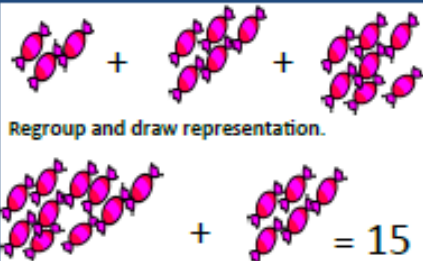
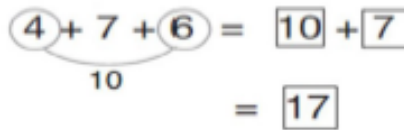
Shape, space and measures: children use everyday language to talk about size, weight, capacity, position, distance, time and money to compare quantities and objects and to solve problems. They recognise, create and describe patterns. They explore characteristics of everyday objects and shapes and use mathematical language to describe them.

EYFS vocabulary: number, add, zero, take away, equal, forwards, backwards, many, altogether, left, more, less, double, share, same, half, digit, one(s) circle, square, triangle rectangle, oval, cube, cuboid, sphere, cylinder, side, corner, edge, round, pointy, bigger(est) smaller(est) taller(est) shorter(est) heavier(est) lighter(est) longer(est), full (er/est) empty(ier/est) on top, behind, next to, between, in front, on top, under, inside, time, today, yesterday, tomorrow, first, next, finally, afterwards, compare

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>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>$12 + 5 = 17$</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>$6 + 5 = 11$</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>$7 + 4 = 11$</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>
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>

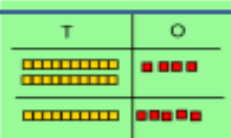

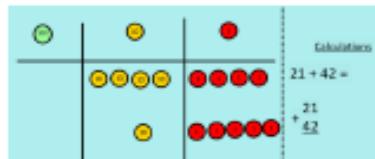

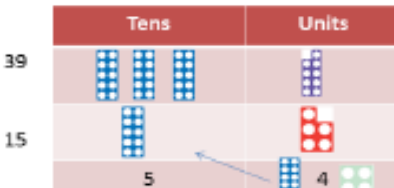
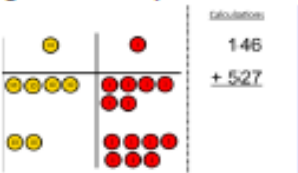
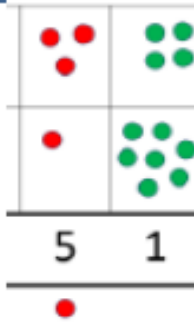
Objective & Strategy	Concrete	Pictorial	Abstract
Adding multiples of ten	$50 = 30 + 20$  Model using Dienes and bead strings.	 $2 \text{ tens} + 8 \text{ tens} = \underline{\hspace{2cm}} \text{ tens}$ $30 + 50 =$ Use representations for base ten.	$20 + 30 = 50$ $70 = 50 + 20$ $40 + \square = 60$
Use known number facts Part part whole	 Children explore ways of making numbers within 20	This can be represented using a bar model. 	$\square + 1 = 20$ $1 + \square = 20$ $20 - 1 = \square$ $20 - \square = 1$
Using known facts	 Three and three makes six. So three tens and three tens make six tens.	 Children draw representations of H,T and O	$3 + 4 = 7$ <i>leads to</i> $30 + 40 = 70$ <i>leads to</i> $300 + 400 = 700$
Bar model	 $3 + 4 = 7$	 $7 + 3 = 10$	 $23 + 25 = 48$

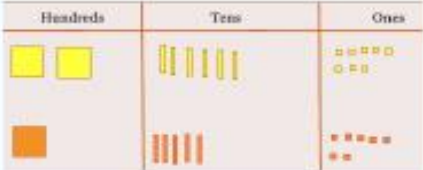
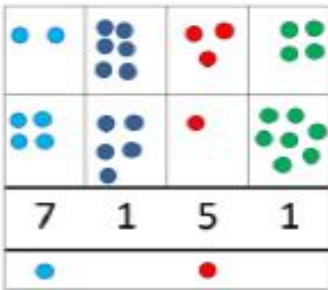
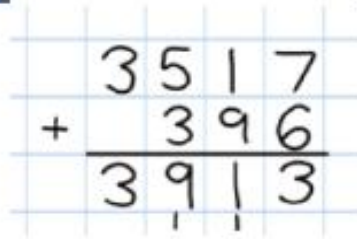

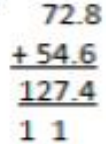
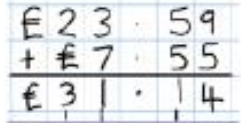
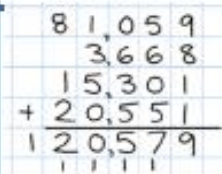

Objective & Strategy	Concrete	Pictorial	Abstract
<p>Add a 2 digit number and ones.</p>		<p>Use part part whole and number line to model.</p> 	<p>$17 + 5 = 22$</p> <p>Explore related facts</p> <p>$17 + 5 = 22$ $5 + 17 = 22$ $22 - 17 = 5$ $22 - 5 = 17$</p> 
<p>Add a 2 digit number and tens</p>	 <p>$25 + 10 = 35$</p> <p>Explore that the ones digit does not change</p>	<p>Number lines or a 100 square can be used.</p> 	<p>$27 + 10 = 37$</p> <p>$27 + 20 = 47$</p> <p>$27 + \square = 57$</p>
<p>Add two 2-digit numbers</p>	 <p>Model using sticks of ten, bundles of straws Dienes or unifix.</p>	 <p>Use number line and bridge ten using part whole if necessary.</p>	
<p>Add three 1-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>$4 + 7 + 6 = 15$</p>	 <p>Combine the two numbers that make/ bridge ten then add on the third.</p>

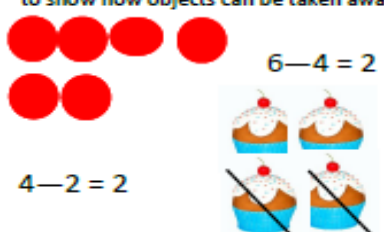
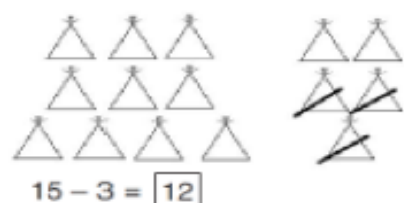
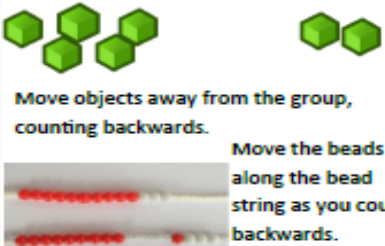
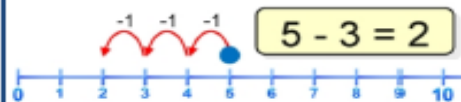
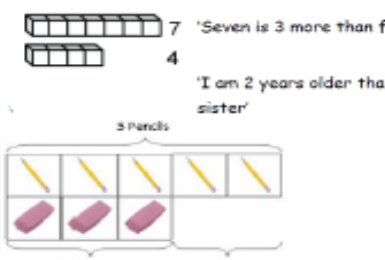
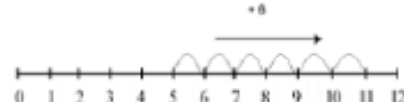
Y3

Y3

ADDITION +

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><i>'Three add four is seven, two tens add one ten is three tens, two hundreds add one hundred is three hundred.'</i></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 to support their understanding of place value, exchanging the ten underneath the line.</p>	$\begin{array}{r} 20 + 5 \\ 40 + 8 \\ 60 + 13 = 73 \end{array}$ <p>Start by partitioning the numbers before formal column to show the exchange.</p> $\begin{array}{r} 536 \\ + 85 \\ \hline 621 \\ 11 \end{array}$

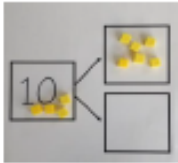
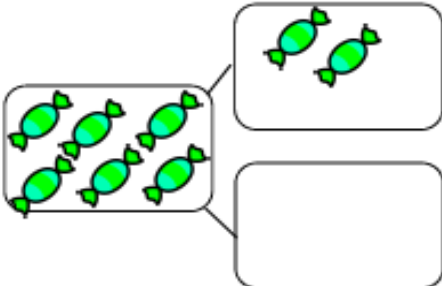
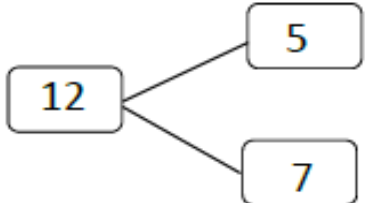

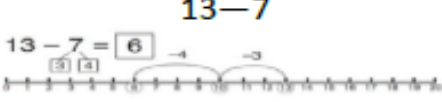
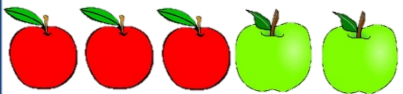


Objective & Strategy	Concrete	Pictorial	Abstract
<p>Y4—add numbers with up to 4 digits</p>	<p>Children continue to use dienes or pv counters to add, exchanging ten ones for a ten and ten tens for a hundred and ten hundreds for a thousand.</p> 	 <p>Draw representations using pv grid.</p>	 <p>Continue from previous work to carry</p> <p>Continue from previous work to exchange 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>		 <p>‘Eight tenths add six tenths equals fourteen tenths, which is the same as one whole and four tenths.’</p> 
<p>Y6—add several numbers of increasing complexity</p> <p>Including adding money, measure and decimals with different numbers of decimal points.</p>	<p>As Y5</p>	<p>As Y5</p>	 <p>Insert zeros for place holders.</p> 

Objective & Strategy	Concrete	Pictorial	Abstract
Taking away ones.	<p>Use physical objects, counters, cubes etc to show how objects can be taken away.</p>  <p>$6 - 4 = 2$</p> <p>$4 - 2 = 2$</p>	 <p>$15 - 3 = 12$</p> <p>Cross out drawn objects to show what has been taken away.</p>	<p>$7 - 4 = 3$</p> <p>$16 - 9 = 7$</p>
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>$5 - 3 = 2$</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>
Find the Difference	<p>Compare objects and amounts</p>  <p>7 'Seven is 3 more than four'</p> <p>4</p> <p>'I am 2 years older than my sister'</p> <p>3 Pencils</p> <p>3 Erasers</p> <p>7</p> <p>Lay objects to represent bar model.</p>	<p>Count on using a number line to find the difference.</p>  <p>+8</p>	<p>Hannah has 12 sweets and her sister has 5. How many more does Hannah have than her sister.?</p>

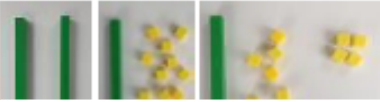



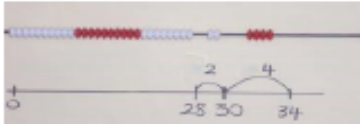
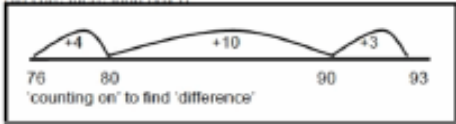
Y1 SUBTRACTION-

Year 1 Subtraction Key vocabulary: subtract, most, least, ones, tens, digit, multiple, fewest, largest, greatest, number sentence, missing number

Y1 SUBTRACTION -













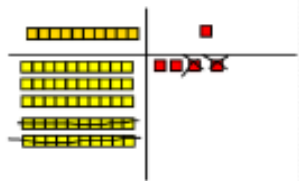
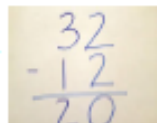














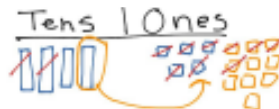
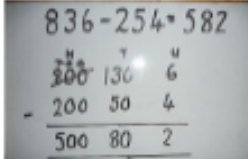
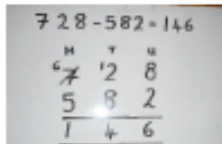




Objective & Strategy	Concrete	Pictorial	Abstract
<p>Represent and use number bonds and related subtraction facts within 20</p> <p>Part Part Whole model</p>	 <p>Link to addition. Use PPW model to model the inverse.</p> <p>If 10 is the whole and 6 is one of the parts, what is the other part?</p> <p>$10 - 6 = 4$</p>	 <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>$14 - 5$</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>	 <p>$5 - 2 = 3$</p>	 <p>$9 - 4 = 5$</p>	 <p>$10 = 8 + 2$ $10 = 2 + 8$ $10 - 2 = 8$ $10 - 8 = 2$</p>

Y2 SUBTRACTION-

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

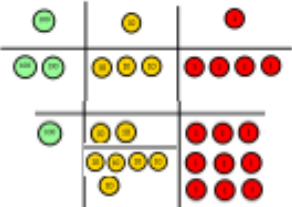
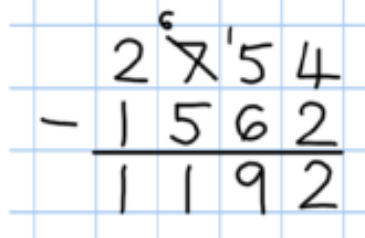
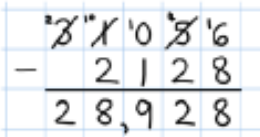
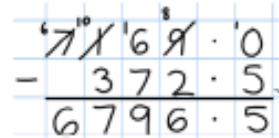
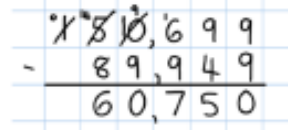
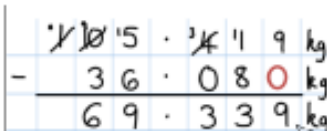
Year 2 Subtraction key vocabulary: numeral, teen, exchange, hundred, thousand, order, compare, equivalent, sequence, difference,

Y3 SUBTRACTION -

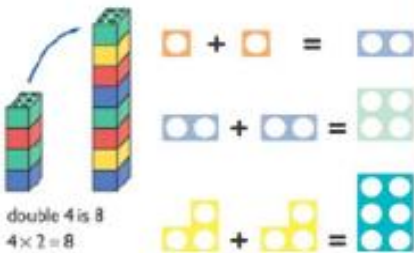

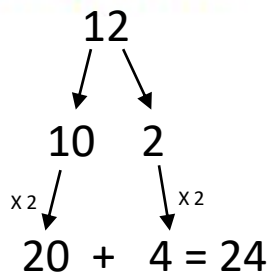

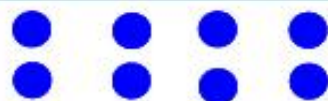
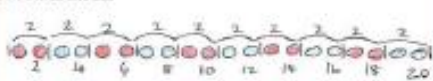



Objective & Strategy	Concrete	Pictorial	Abstract												
Column subtraction without regrouping (friendly numbers)	<table><tr><td>T</td><td>O</td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr></table> <p>47 – 32</p> <table><tr><td>T</td><td>O</td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr></table> <p>Start with 47 (as above). Subtract 32 (drag down) This leaves 15 left, the answer to the calculation (see opposite).</p>	T	O					T	O					 $\begin{array}{r} 54 \\ - 22 \\ \hline 32 \end{array}$ <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> 
T	O														
															
T	O														
															
															
Column subtraction with regrouping	<table><tr><td>Tens</td><td>Ones</td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr></table> <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>	Tens	Ones					$45 - 29 = 16$ <p>Tens Ones</p>  $\begin{array}{l} 10 + 6 = 16 \end{array}$ <p>Children may draw base ten or PV counters and cross off.</p>	$836 - 254 = 582$  <p>Begin by partitioning into pv columns</p> $728 - 582 = 146$  <p>Then move to formal method.</p>						
Tens	Ones														
															
															

Y4-6

SUBTRACTION -

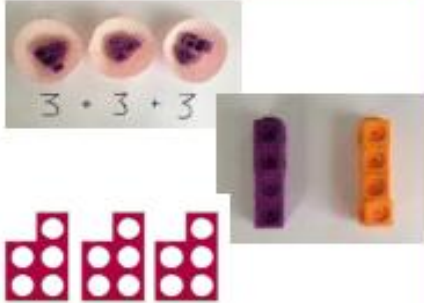
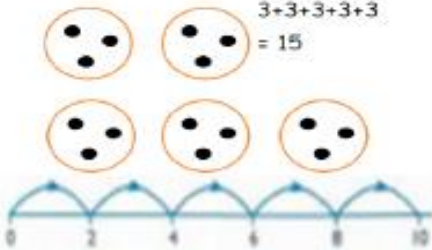

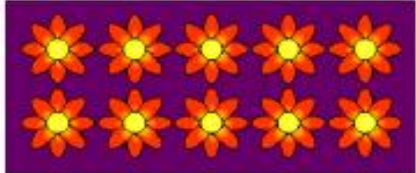

Objective & Strategy	Concrete	Pictorial	Abstract
<p>Subtracting tens and ones</p> <p>Year 4 subtract with up to 4 digits.</p> <p><i>Introduce decimal subtraction through context of money</i></p>	<p>234 - 179</p>  <p>Model process of exchange using Dienes and then move to PV counters.</p>	<p>Children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

Y1 MULTIPLICATION X

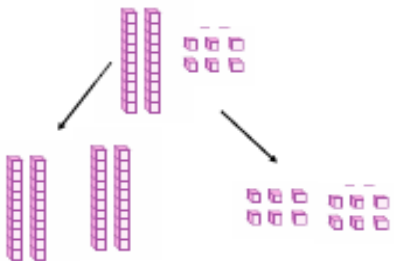
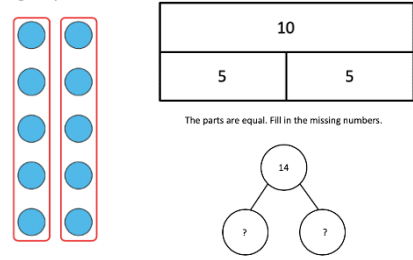
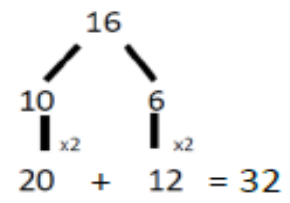
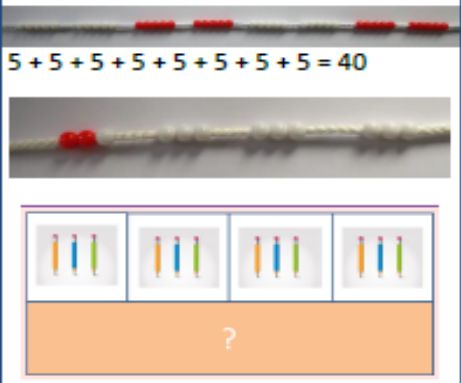
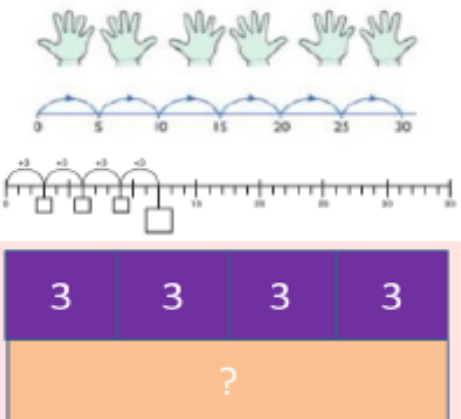
Objective & Strategy	Concrete	Pictorial	Abstract
Doubling	<p>Use practical activities using manipulatives including cubes and Numicon to demonstrate doubling</p>  <p>double 4 is 8 $4 \times 2 = 8$</p>	<p>Draw pictures to show how to double numbers</p> <p>Double 4 is 8</p> 	<p>Partition a number and then double each part before recombining it back together.</p> 
Counting in multiples	<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.</p> <p>Write sequences with multiples of numbers.</p> <p>2, 4, 6, 8, 10</p> <p>5, 10, 15, 20, 25, 30</p>
Making equal groups and counting the total	  <p>$\square \times \square = 8$</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>

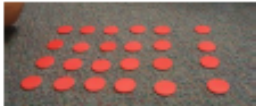
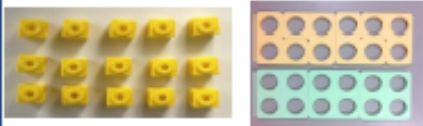


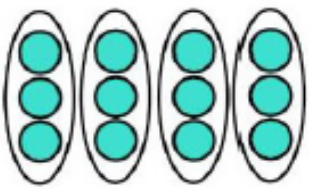
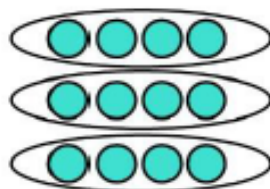


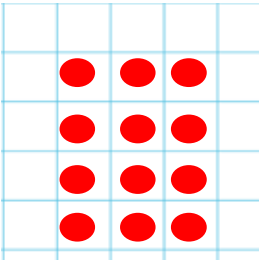
Y1

MULTIPLICATION X

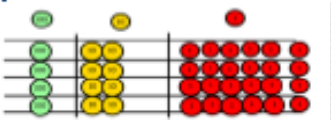
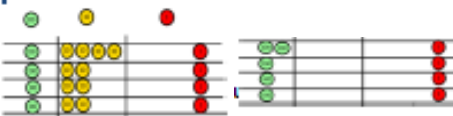
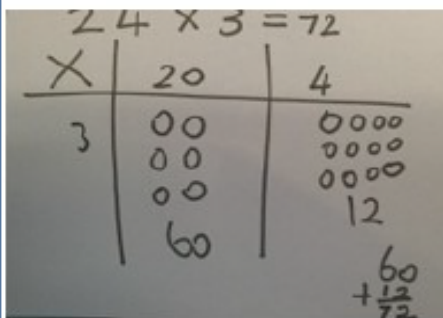
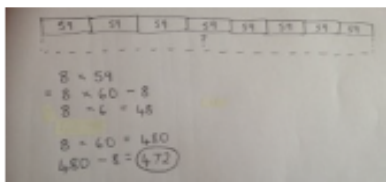
Objective & Strategy	Concrete	Pictorial	Abstract
Repeated addition	 <p>Use different objects to add equal groups</p>	<p>Use pictorial including number lines to solve prob</p> <p>There are 3 sweets in one bag. How many sweets are in 5 bags altogether?</p>  $3+3+3+3+3 = 15$	<p>Write addition sentences to describe objects and pictures.</p>  $2+2+2+2+2 = 10$ <p>'Five lots of two equals ten.'</p> <p>Then represent the same calculation as multiplication;</p> $5 \times 2 = 10$
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 X

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>2 groups of 5</p>  <p>The parts are equal. Fill in the missing numbers.</p>	<p>Partition a number and then double each part before recombining it back together.</p>  <p>$20 + 12 = 32$</p>
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>  <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</p> <p>0, 3, 6, 9, 12, 15</p> <p>0, 5, 10, 15, 20, 25, 30</p> <p>$4 \times 3 = \square$</p>

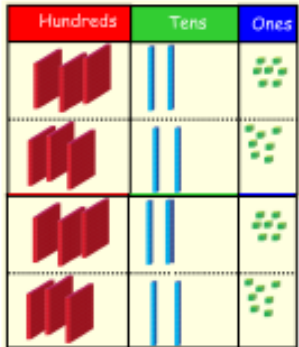
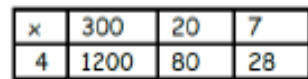
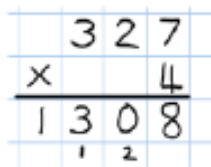
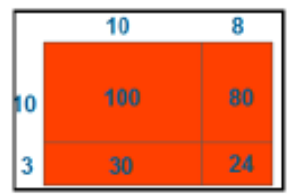

Objective & Strategy	Concrete	Pictorial	Abstract
<p>Multiplication is commutative</p>	<p>Create arrays using counters and cubes and Numicon.</p>    <p>Pupils should understand that an array can represent different equations and that, as multiplication is commutative, the order of the multiplication does not affect the answer.</p> 	<p>Use representations of arrays to show different calculations and explore commutativity.</p>  	<p>$12 = 3 \times 4$</p> <p>$12 = 4 \times 3$</p> <p>Use an array to write multiplication sentences and reinforce repeated addition.</p>  <p>$5 + 5 + 5 = 15$</p> <p>$3 + 3 + 3 + 3 + 3 = 15$</p> <p>$5 \times 3 = 15$</p> <p>$3 \times 5 = 15$</p>
<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>$4 \times 3 = 12$</p> <p>$12 \div 3 = 4$</p> <p>$3 \times 4 = 12$</p> <p>$12 \div 4 = 3$</p>	<p>$2 \times 4 = 8$</p> <p>$4 \times 2 = 8$</p> <p>$8 \div 2 = 4$</p> <p>$8 \div 4 = 2$</p> <p>$8 = 2 \times 4$</p> <p>$8 = 4 \times 2$</p> <p>$2 = 8 \div 4$</p> <p>$4 = 8 \div 2$</p> <p>Show all 8 related fact family sentences.</p>

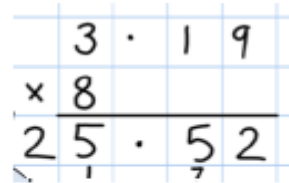
Objective & Strategy	Concrete	Pictorial	Abstract																																																																																																																																				
Grid method	<p>Show the links with arrays to first introduce the grid method.</p> <div><table><tr><td>x</td><td>10</td><td>3</td></tr><tr><td>4</td><td></td><td></td></tr></table><p>4 rows of 10 4 rows of 3</p></div> <p>Move onto base ten to move towards a more compact method.</p> <div><table><tr><td>x</td><td>T</td><td>O</td></tr><tr><td>4</td><td></td><td></td></tr></table><p>4 rows of 13</p></div> <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> <div><table><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><tr><td></td><td></td><td></td></tr></table><p>Calculations 4×126</p></div> <p>Fill each row with 126</p> <div><table><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><tr><td></td><td></td><td></td></tr></table><p>Calculations 4×126</p></div> <p>Add up each column, starting with the ones making any exchanges needed</p> <div><table><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><tr><td></td><td></td><td></td></tr></table><table><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><tr><td></td><td></td><td></td></tr></table></div> <p>Then you have your answer.</p>	x	10	3	4			x	T	O	4																																																															<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> <div><table><tr><td>24</td><td>x</td><td>3</td><td>=</td><td>72</td></tr><tr><td>X</td><td>20</td><td>4</td><td></td><td></td></tr><tr><td>3</td><td>00</td><td>0000</td><td></td><td></td></tr><tr><td></td><td>00</td><td>0000</td><td></td><td></td></tr><tr><td></td><td>00</td><td>0000</td><td></td><td></td></tr><tr><td></td><td>60</td><td>12</td><td></td><td></td></tr><tr><td></td><td></td><td>60</td><td></td><td></td></tr><tr><td></td><td></td><td>+ 12</td><td></td><td></td></tr><tr><td></td><td></td><td>72</td><td></td><td></td></tr></table></div>	24	x	3	=	72	X	20	4			3	00	0000				00	0000				00	0000				60	12					60					+ 12					72			<p>Start with multiplying by one digit numbers and showing the clear addition alongside the grid.</p> <div><table><tr><td>x</td><td>30</td><td>5</td></tr><tr><td>7</td><td>210</td><td>35</td></tr></table><p>$210 + 35 = 245$</p></div> <p>Moving forward, multiply by a 2 digit number showing the different rows within the grid method.</p> <div><table><tr><td></td><td>10</td><td>8</td></tr><tr><td>10</td><td>100</td><td>80</td></tr><tr><td>3</td><td>30</td><td>24</td></tr></table></div>	x	30	5	7	210	35		10	8	10	100	80	3	30	24
x	10	3																																																																																																																																					
4																																																																																																																																							
x	T	O																																																																																																																																					
4																																																																																																																																							
24	x	3	=	72																																																																																																																																			
X	20	4																																																																																																																																					
3	00	0000																																																																																																																																					
	00	0000																																																																																																																																					
	00	0000																																																																																																																																					
	60	12																																																																																																																																					
		60																																																																																																																																					
		+ 12																																																																																																																																					
		72																																																																																																																																					
x	30	5																																																																																																																																					
7	210	35																																																																																																																																					
	10	8																																																																																																																																					
10	100	80																																																																																																																																					
3	30	24																																																																																																																																					

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>Calculations 4×126</p> <p>Fill each row with 126</p>  <p>Add 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> <table border="1" data-bbox="1360 361 1649 448"><tr><td>x</td><td>30</td><td>5</td></tr><tr><td>7</td><td>210</td><td>35</td></tr></table> <p>$210 + 35 = 245$</p>	x	30	5	7	210	35																																			
x	30	5																																										
7	210	35																																										
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. $327 \times 4 = 1308$</p> <table border="1" data-bbox="336 876 645 1205"><thead><tr><th>Hundreds</th><th>Tens</th><th>Ones</th></tr></thead><tbody><tr><td>3</td><td>2</td><td>7</td></tr><tr><td>3</td><td>2</td><td>7</td></tr><tr><td>3</td><td>2</td><td>7</td></tr><tr><td>3</td><td>2</td><td>7</td></tr></tbody></table> <p>It is important at this stage that they always multiply the ones first.</p> <p>The corresponding long multiplication is modelled alongside</p>	Hundreds	Tens	Ones	3	2	7	3	2	7	3	2	7	3	2	7	<table border="1" data-bbox="886 782 1195 861"><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	<table border="1" data-bbox="1302 848 1534 1018"><tr><td></td><td>3</td><td>2</td><td>7</td></tr><tr><td>x</td><td></td><td></td><td>4</td></tr><tr><td></td><td>1</td><td>3</td><td>0</td><td>8</td></tr><tr><td></td><td></td><td>1</td><td>2</td><td></td></tr></table> <p>This may lead to a compact method.</p>		3	2	7	x			4		1	3	0	8			1	2	
Hundreds	Tens	Ones																																										
3	2	7																																										
3	2	7																																										
3	2	7																																										
3	2	7																																										
x	300	20	7																																									
4	1200	80	28																																									
	3	2	7																																									
x			4																																									
	1	3	0	8																																								
		1	2																																									

Y5-6



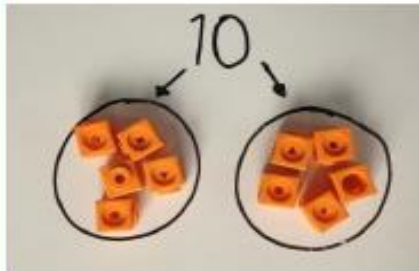

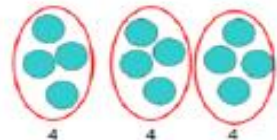
MULTIPLICATION X

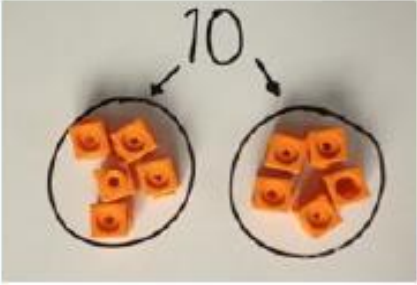

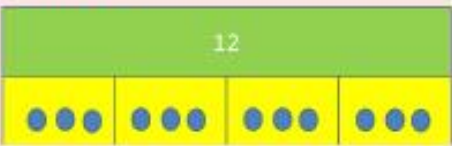
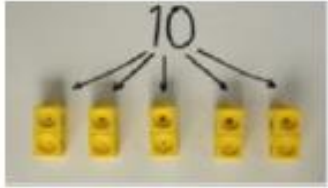

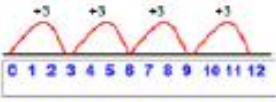
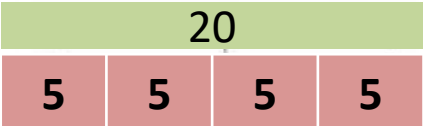
Objective & Strategy	Concrete	Pictorial	Abstract
<p>Column Multiplication for 3 and 4 digits x 1 digit.</p>	 <p>It is important at this stage that they always multiply the ones first.</p> <p>Children can continue to be supported by place value counters at the stage of multiplication. This initially done where there is no regrouping.</p> <p>$327 \times 4 = 1308$</p>		 <p>This will lead to a compact method.</p>
<p>Column Multiplication for 2 or more digits x 2 or more digits.</p>	<p>Manipulatives may still be used with the corresponding long multiplication modelled alongside.</p>		 <p>Start on the first row with 3×18. $3 \times 8 = 24$. This is 2 tens and 4 ones. Place the 2 tens in the tens column and the 4 ones in the ones column. $3 \times 10 = 30$. So there are 3 tens and then I need to add the 2 tens to make 5 tens in total. Move onto the second row to calculate 10×18. $10 \times 8 = 80$ so put 8 tens in the tens column and 0 ones in the ones column. $10 \times 10 = 100$ so put 1 hundred in the hundreds column.</p>

Objective & Strategy	Concrete	Pictorial	Abstract
Multiplying decimals up to 2 decimal places by a single digit.			<p>Remind children that the single digit belongs in the ones column and to line up the decimal points in the question and answer.</p>  <p><i>'Eight groups of nine hundredths is seventy two hundredths, which is the same as seven tenths and two hundredths. Eight groups of one tenths makes eight tenths; add the seven tenths to give a total of fifteen tenths, which is the same as one whole and five tenths. Eight groups of three makes twenty four; add on the extra one whole one, to make twenty five ones'</i></p>

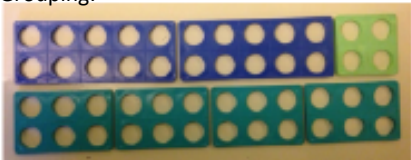

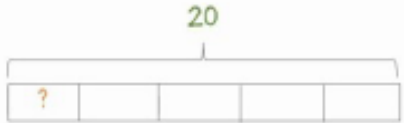
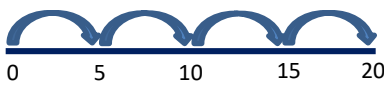

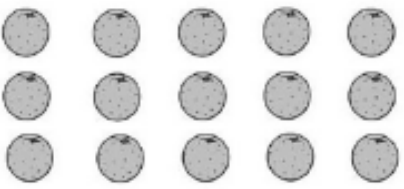
Y6

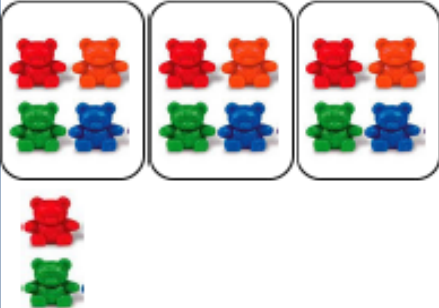


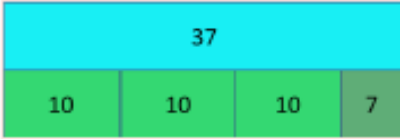
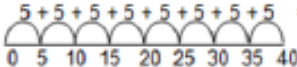
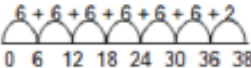
MULTIPLICATION X

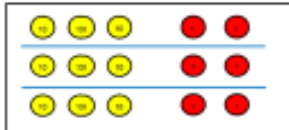





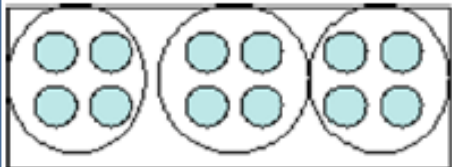
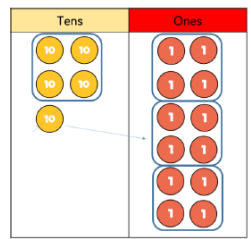
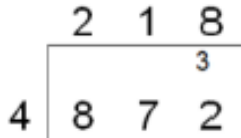
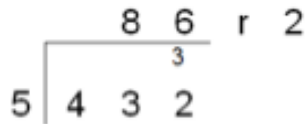
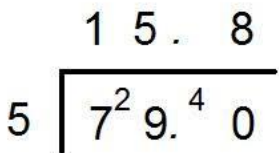
Objective & Strategy	Concrete	Pictorial	Abstract
Division as sharing	<div></div> <div></div> <div></div> <p>I have 10 cubes, can you share them equally in 2 groups?</p>	<p>Children use pictures or shapes to share quantities.</p> <div></div> <p>8 shared between 2 is 4</p> <p>Sharing:</p> <div></div> <p>12 shared between 3 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> $10 \div 2 = 5$	<p>Children use pictures or shapes to share quantities.</p>  $8 \div 2 = 4$ <p>Children use bar modelling to show and support understanding.</p>  $12 \div 4 = 3$	$12 \div 3 = 4$ <p>Divide 12 into 3 groups.</p> <p>How many are in each group?</p>
Division as grouping	<p>Divide quantities into equal groups.</p> <p>Use cubes, counters, objects or place value counters to aid understanding.</p>  $10 \div 2 = 5$  $35 \div 5 = 7$	<p>Use number lines for grouping</p>  $12 \div 3 = 4$ <p>How many groups of 5 are needed to make 20? This can be represented in a bar model like this:</p>  $20 \div 5 = ?$ $5 \times ? = 20$	$28 \div 7 = 4$ <p>Divide 28 into groups of 7.</p> <p>How many groups of 7 can you make?</p>

Y3 DIVISION ÷

Objective & Strategy	Concrete	Pictorial	Abstract
<p>Division as grouping and sharing continued. Understand that grouping is repeated subtraction.</p>	<p>Use cubes, counters, objects or place value counters to aid understanding. Grouping:</p>  <p>24 divided into groups of 6 = 4 Sharing:</p> $96 \div 3 = 32$ 	<p>Continue to use bar modelling to aid solving division problems.</p>  <p>20 $20 \div 5 = ?$ $5 \times ? = 20$</p> <p>Continue to use number lines to support.</p> 	<p>How many groups of 6 in 24?</p> $24 \div 6 = 4$ <p>I have 24 and share them into 6 groups. How many are in each group?</p>
<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>Children may use this to answer questions such as, <i>I have 15 cubes in rows of 5. How many in each column?</i></p>	<p>Find the inverse of multiplication and division sentences by creating eight linking number sentences.</p> <p>$7 \times 4 = 28$ $4 \times 7 = 28$ $28 \div 7 = 4$ $28 \div 4 = 7$ $28 = 7 \times 4$ $28 = 4 \times 7$ $4 = 28 \div 7$ $7 = 28 \div 4$</p>

Objective & Strategy	Concrete	Pictorial	Abstract
Division with remainders using sharing or grouping.	<p>$14 \div 3 =$</p> <p>Sharing: 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>$13 \div 4 = 3 \text{ r}1$</p>  <p>Draw dots and group them to divide an amount and clearly show a remainder</p> <p>Grouping: $14 \div 3 = 4 \text{ r}2$</p>  <p>Use bar models to show division with remainders.</p> <p>$37 \div 10 = 3 \text{ r}7$</p>  <p>Example without remainder: $40 \div 5$ Ask "How many 5s in 40?"</p>  <p>Example with remainder: $38 \div 6$</p>  <p>For larger numbers, when it becomes inefficient to count in single multiples, bigger jumps can be recorded using known facts.</p>	<p>Complete written divisions and show the remainder using r.</p> <p>$29 \div 8 = 3 \text{ REMAINDER } 5$</p> <p>↑ ↑ ↑ ↑ dividend divisor quotient remainder</p>

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 Ones 3 2</p>  <p>Use place value counters to divide using the short standard method alongside:</p>  <p>Calculations $42 \div 3$</p>  <p>$42 \div 3 =$</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><i>This can also be completed using grouping.</i></p>	<p>Students can continue to use drawn diagrams with dots or circles to help them divide numbers into equal groups.</p>  <p>They may also use drawings of Dienes or place value counters.</p> <p>Encourage them to move towards counting in multiples to divide more efficiently.</p> <p>Children should also use the method of grouping to divide.</p>  <p>$52 \div 4 = 13$</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>  <p>These can be completed through sharing or grouping.</p>

Long Division

Introduce children to long division as a method of dividing by a 2 digit number.

1. Children should begin by starting with this expanded method (see opposite) which supports them with understanding how multiples can help with division. It can also support children to see division as repeated subtraction; therefore linking their understanding of grouping.

$$432 \div 12 = 36$$

		0	3	6	
1	2	4	3	2	
	-	3	6	0	(12 x 30)
			7	2	
	-		7	2	(12 x 6)
				0	

Multiples of 12:

$12 \times 1 = 12$
 $12 \times 2 = 24$
 $12 \times 3 = 36$
 $12 \times 4 = 48$
 $12 \times 5 = 60$
 $12 \times 6 = 72$
 $12 \times 7 = 84$
 $12 \times 8 = 96$
 $12 \times 9 = 108$
 $12 \times 10 = 120$

2. Children can then progress to the formal compact method for long division (without the calculations in the brackets) when appropriate.

$$516 \div 12 = 43$$

$$\begin{array}{r}
 43 \\
 12 \overline{) 516} \\
 \underline{- 48} \\
 36 \\
 \underline{- 36} \\
 0
 \end{array}$$

3. When secure, children will be expected to use either long division method and interpret remainders as whole numbers, decimals, fractions or rounding as required.