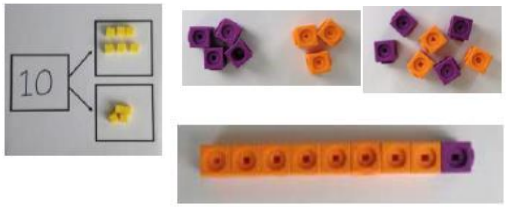
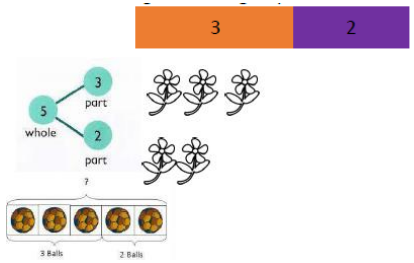
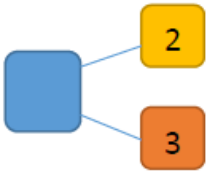
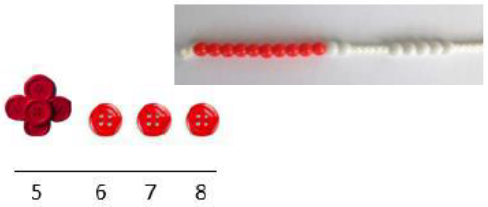
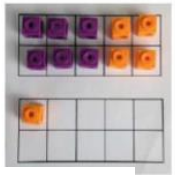
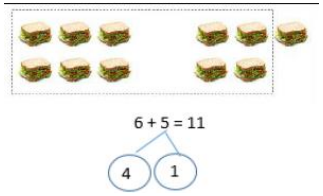
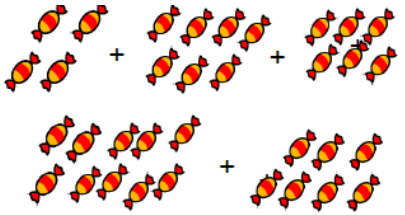
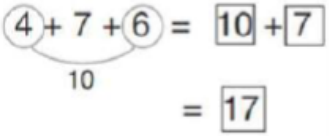
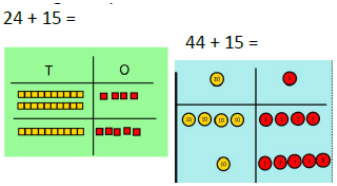
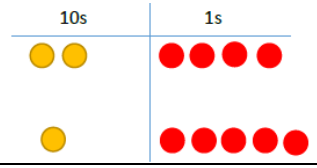
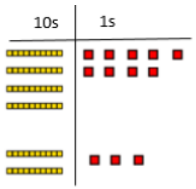
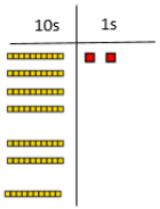
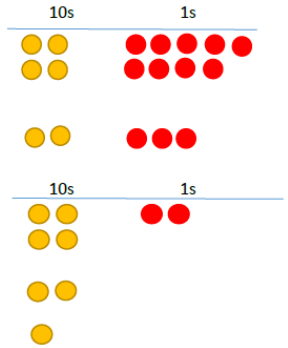
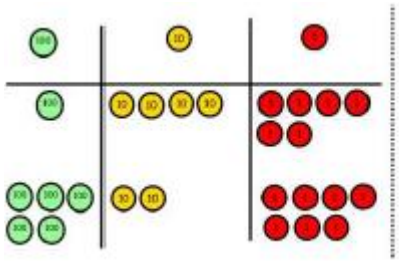
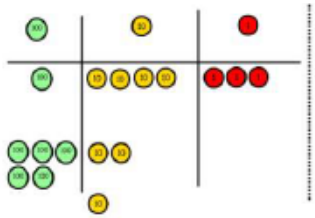
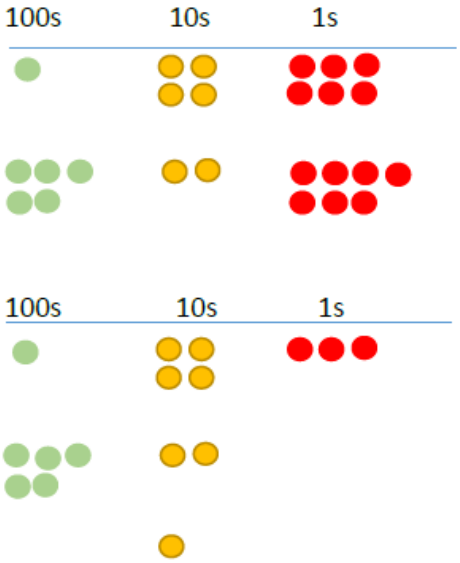
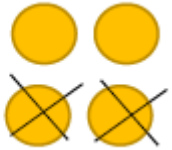
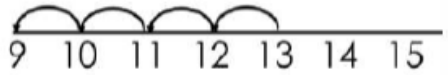
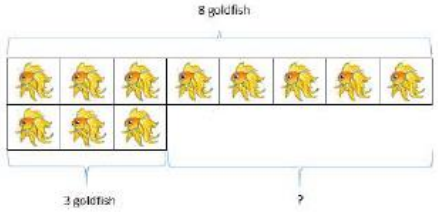
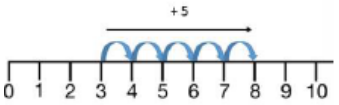
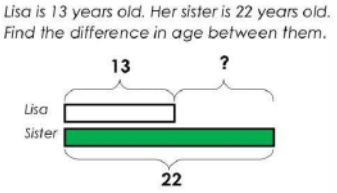
Calculation policy - addition

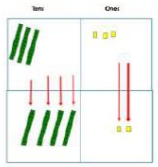
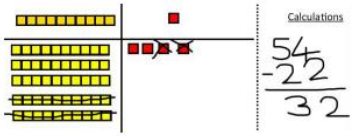
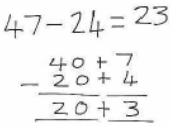
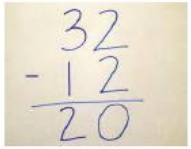
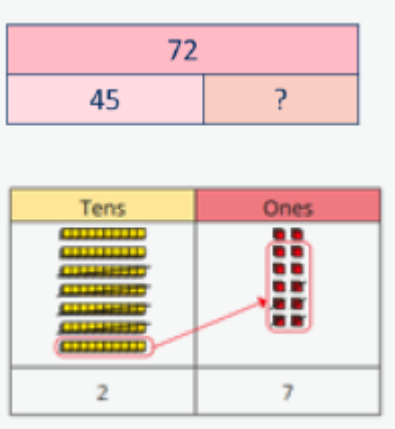
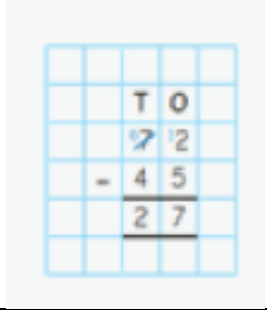
Year	Objective	Concrete	Pictorial	Abstract
1	**Number bonds**	Use cubes to add two numbers together in groups or in a bar 	Use pictures to add two numbers together as a group or in a bar. 	Use the part whole model diagram to move into the abstract. 2 + 3 = 5 3 + 2 = 5 5 = 3 + 2 5 = 2 + 3 
	Counting	Start with the larger number on the bead string then count on the smaller number 1 by 1 to find the answer. 	Use a number line to count in ones. 	5 + 3 = 8
	Regrouping to make 10	Start with the bigger number and use the smaller number to make 10.  6 + 5 = 11	6 + 5 = 11  6 + 4 = 10 10 + 1 = 11	6+5=11

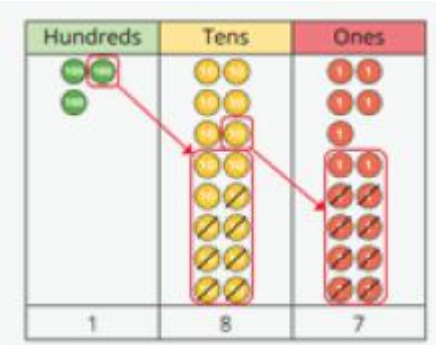
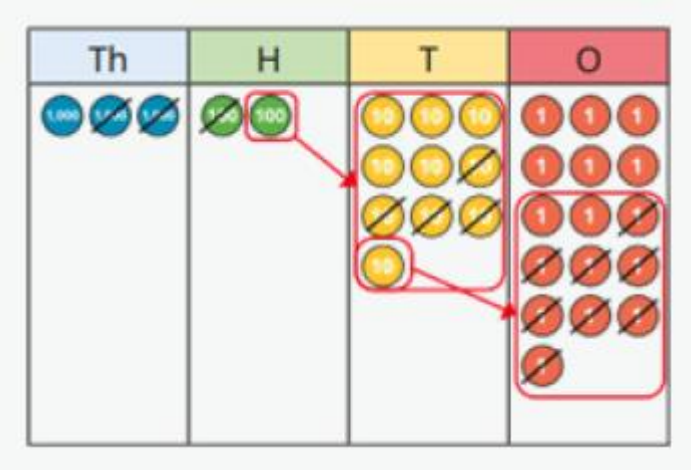
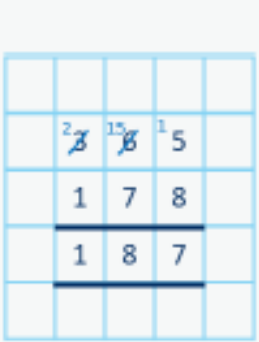
2	**Add 3 single digit numbers**	4 + 7 + 6 = 17 Put 4 and 6 together to make 10 then add on the 7. Following on from making 10, make 10 with 2 digits (if possible) then add on the third digit.	Add together three groups of objects. Draw a picture to recombine the groups to make 10. 	Combine the two numbers that make 10 and then add on the remainder. 
	Column method without regrouping	Add together the ones first, then add the tens. Use the base 10 blocks first before moving onto place value counters. 	After physically using the base 10 blocks and place value counters, children can draw the counters to help them to solve additions. 	24 + 15 = 39 $\begin{array}{r} 24 \\ +\ 15 \\ \hline 39 \end{array}$
	Column method with regrouping	Make both numbers on a place value grid.  Add up the units and exchange 10 ones for 1 ten. 	Using place value counters, children can draw the counters to help them solve additions. 	$\begin{array}{r} 40 + 9 \\ \underline{20 + 3} \\ 60 + 12 = 72 \end{array}$

¾	**Column method with regrouping**	Make both numbers on a place value grid.  146 + 527 Add up the units and exchanging the 10 ones for 1 ten.  146 + 527 As children move on to decimals, money and decimal place value counters can be used to support learning. NB: In Year 4 children add 4 digit numbers.	Children can draw pictorial representation of the columns and place counters to further support their learning and understanding.  	As children progress, they will move from the expanded to the compacted method. 100 + 40 + 6 500 + 20 + 7 600 + 70 + 3 = 673 146 + 527 673 1 As the children move on, introduce decimals with the same number of decimal places and different. Money can be used here.
5/6	Column method with regrouping	Consolidate understanding using numbers with more than 4 digits and extend by adding numbers with up to 3 decimal places.		

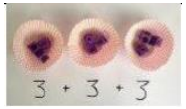
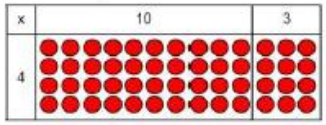
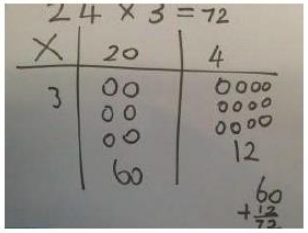
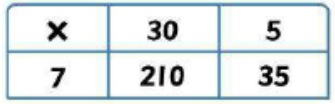
Calculation policy - subtraction

Year	Objective	Concrete	Pictorial	Abstract
1	**Taking away ones**	Use physical objects, counters, cubes etc. to show how objects can be taken away. 4 – 2 = 2 	Cross out drawn objects to show what has been taken away. 4 – 2 = 2 	4 – 2 = 2
	Counting back	Make the larger number in your subtraction. Move the beads along your bead string as you count backwards in ones. 13 – 4 = 9 	Count back on a number line or number track.  Start at the bigger number and count back the smaller number, showing the jumps on the number line.	Put 13 in your head, count back 4. What number are you at? Use your fingers to help.
2	**Find the difference**	Compare amounts and objects to find the difference. Use cubes to build towers or make bars to find the difference. Use basic bad models with items to find the difference. 	Count on to find the difference.  Draw bars to find the difference between 2 numbers. 	Hannah has 8 goldfish. Helen has 3 goldfish. Find the difference between the number of goldfish the girls have.

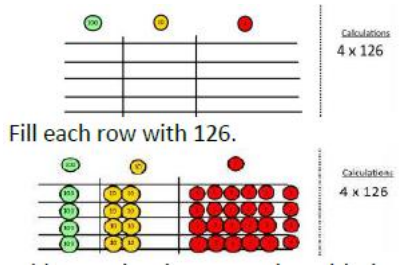
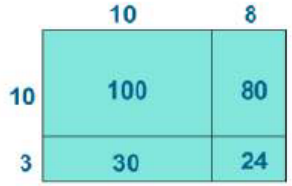
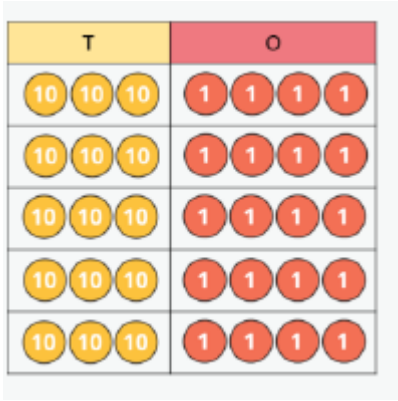
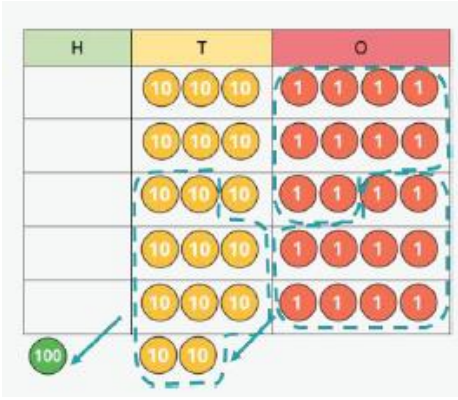
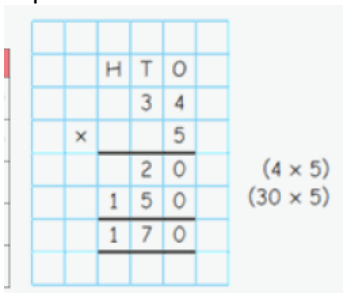
	Column method without regrouping	Use base 10 to make the bigger number then take the smaller number away. 75 – 42 = 33  Show how you partition numbers to subtract. Again make the larger number first.	Draw base 10 or place value counters alongside the written calculation to help to show working. 	 This will lead to clear written column subtraction. 
	Column method with regrouping	Make the larger number with the place value counters. Start with the ones. Can I take away 8 from 4 easily? I need to exchange 1 of my tens for 10 ones. Now I can subtract my ones. 	Draw the counters onto a place value grid and show what you have taken away by crossing the counters out as well as clearly showing the exchanges you make.	Children can start their formal written method by partitioning the number into clear place value columns. Moving forward children will begin to use a more compact method (NB: towards the end of the year). 

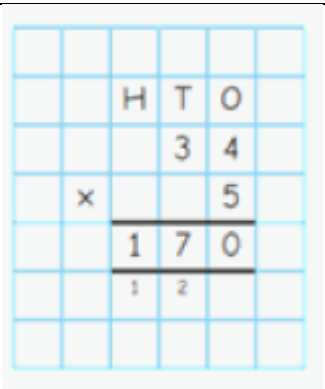
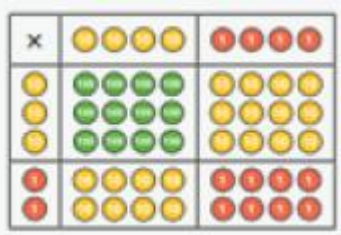
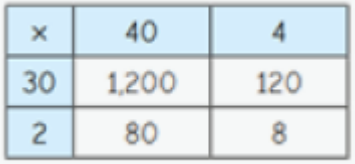
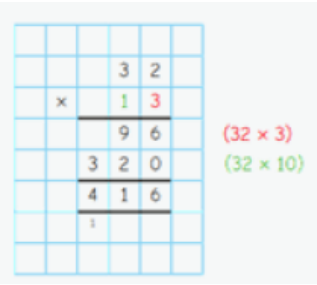
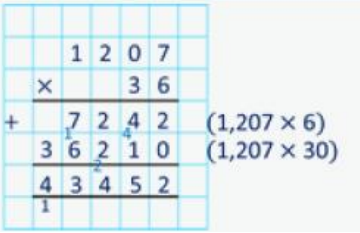
Year 3 and up	**Column method with regrouping**	Now look at the tens, can I take away 8 tens easily? I need to exchange 1 hundred for 10 tens. Now I can take away 8 tens and complete the subtraction. Show children how the concrete method links to the written method alongside your working. Cross out the numbers when exchanging to show where we write our new amount.   		

Calculation policy - multiplication

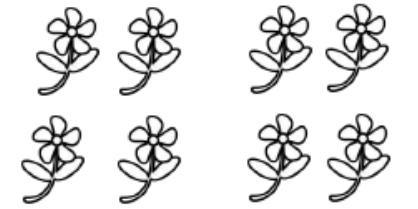
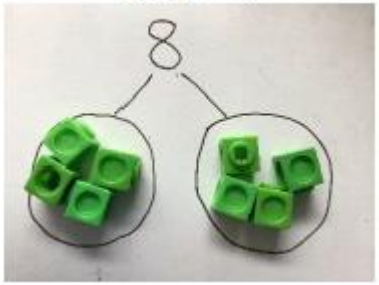
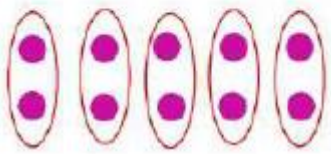
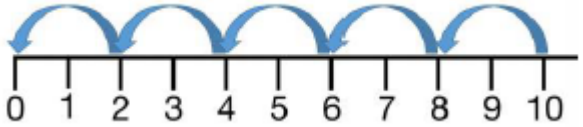
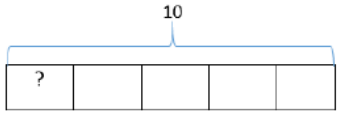
Year	Objective	Concrete	Pictorial	Abstract
1/2	**Repeated addition**	Use different objects to add equal groups.  	There are 3 plates. Each plate has 2 star biscuits on. How many biscuits are there? 	Write addition sentences to describe objects and pictures. 2 + 2 + 2 = 6
	Arrays: showing commutative multiplication	Create arrays using counters / cubes to show multiplication sentences. 	Draw arrays in different rotations to find commutative multiplication sentences. 4 × 2 = 8 2 × 4 = 8 2 × 4 = 8 4 × 2 = 8	Use an array to write multiplication sentences and 5 + 5 + 5 = 15 3 + 3 + 3 + 3 + 3 = 15 5 x 3 = 15 3 x 5 = 15 reinforce repeated addition.
3/4	**Grid method**	Show the link with arrays first to introduce grid method.  4 rows of 10 4 rows of 3 Move on to place value counters to show how we are finding groups of a number.	Children can represent the work they have done by drawing place value counters. 	Start with multiplying by one digit numbers and showing clear addition alongside the  210 + 35 = 245 grid.

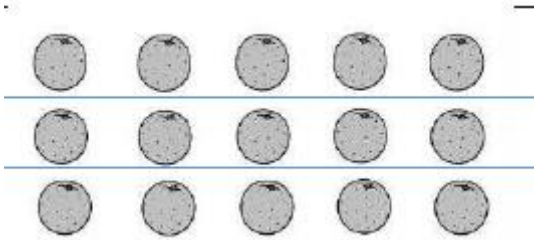
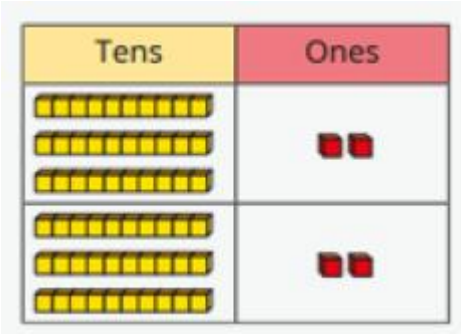
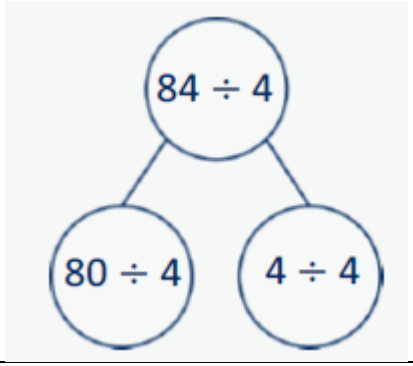
×	30	5
7	210	35

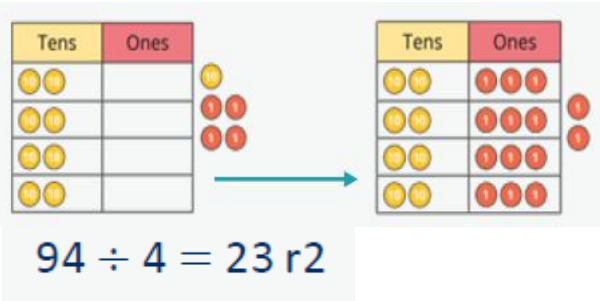
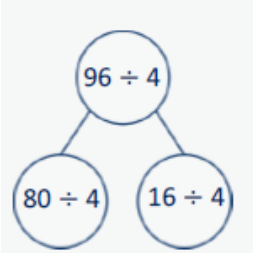
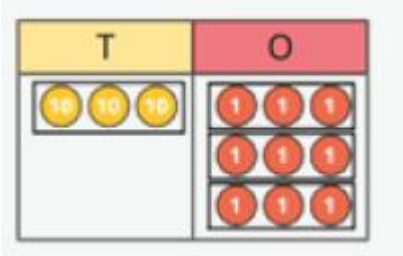
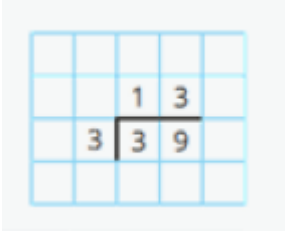
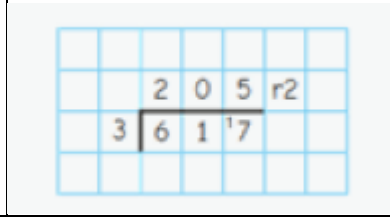
				Moving forward, multiply by a 2 digit number showing the  different rows within the grid method.
	Expanded method	Show the link with arrays first to introduce the expanded method. 		The short method of multiplication is introduced for the first time, initially in the expanded form.  The short method is taught in compact form.

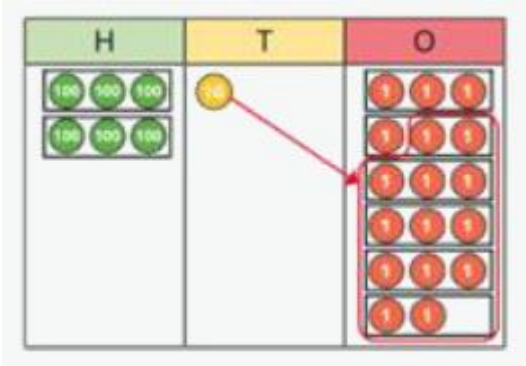
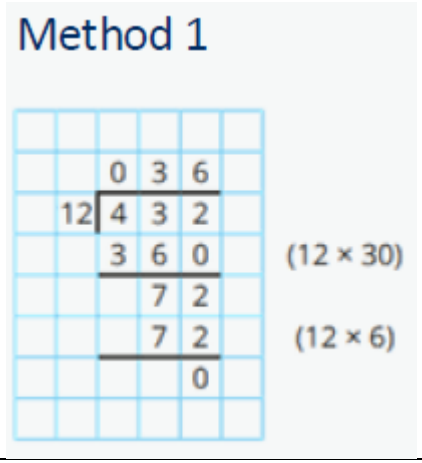
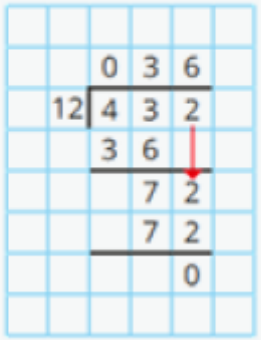
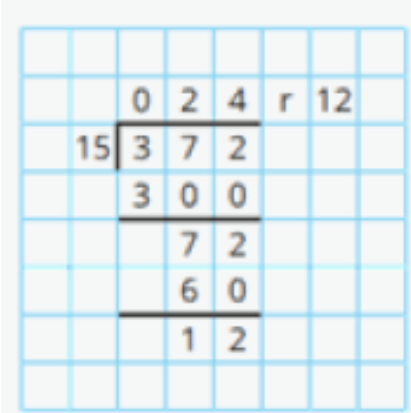
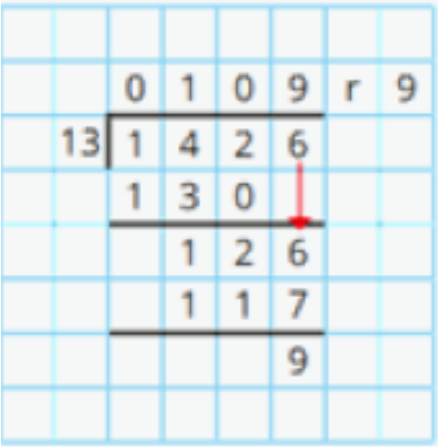
				
5/6	**Compacted method (3/2 digit by 2 digit)**	Multiplies are first partitioned into a grid model using place value counters.  $32 \times 44 = 1{,}200 + 80 + 120 + 8$ $32 \times 44 = 1{,}408$	Grid model can then be used to support multiplication using place value partitioning.  $32 \times 44 = 1{,}200 + 80 + 120 + 8$ $32 \times 44 = 1{,}408$	Begin with long multiplication before moving to the compacted method.  

Calculation policy - division

Year	Objective	Concrete	Pictorial	Abstract
1/2	**Sharing**	I have 8 cubes, can you share them equally between two people?	Children use pictures or shapes to share quantities.  8 ÷ 2 = 4	Share 8 buns between two people. 8 ÷ 2 = 4 
	Grouping	Divide quantities into equal groups. Use cubes, counters, objects or place value counters to aid understanding. 	Use a number line to show jumps in groups. The number of jumps equals the number of groups.  Think of a bar model as a whole. Split it into the number of groups you are dividing by and work out how many would be in each group.  10 ÷ 5 = ? 5 x ? = 10	Divide 10 into 5 groups. How many are in each group? 10 ÷ 5 = 2
Year 2	**Division with arrays**	Link division and multiplication using arrays, thinking about number sentences that can be created.	Draw arrays and use lines to split the array into groups.	Find inverse multiplication and division sentences.

				5 x 3 = 15 3 x 5 = 15 15 ÷ 5 = 3 15 ÷ 3 = 5
3/4	**Division with no remainders**	Partitioned into tens and ones to divide then recombine. Using base ten blocks and place value charts to begin. 	Partition the numbers using a part whole model. 	Partition 2 digit number to divide then recombine. 60 ÷ 2 = 30 4 ÷ 2 = 2 64 ÷ 2 = 32

	Division with remainders.	First look at using remainders in division. Children should be encouraged to flexibly partition numbers using base ten to help division.  	 	
Year 5				
	Short division with remainders	Short division introduced for the first time. Using place value counters to group by divisor.  		 

		Using place value counters to physically move remainders and convert to ones. 		
Year 6	**Long division**	Long division first introduced. 2 methods taught. Beginning with long division without a remainder answer. 	Moving on to long division with a remainder answer.	

		Method 2