MAYBURY PRIMARY SCHOOL

Calculation Policy

Produced: Spring 2025
Review Due: Spring 2027

engage enrich excel academies

Maybury Primary School

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This calculation policy has been written in line with the 2014 mathematics programmes of study. The methods that are used are taught during maths lesson throughout their time at Maybury primary, using the steps as a 'ladder' process. Once they are confident with each method, they will move onto the next step, developing their efficiency with arithmetic. Teacher assessment will be used to decide when the children are ready to move onto the next calculation step.

The ladders use a three-step process:

1. Concrete: using physical objects and learning tools to aid their understanding.
2. Pictorial: using and drawing pictures and diagrams to aid their understanding.
3. Abstract: more formal methods, which are used once they have understood how the method works.

Aims of the policy:

- To ensure consistency and progression in our approach to calculation.
- To ensure children develop efficient methods for each operation.
- To ensure children are using these methods accurately to support their learning in mathematics.

Pictures and diagrams have been used to show examples of ways in which this can look in the classroom.

Addition (+) Progression	Objectives	Concrete	Pictorial	Abstract
Step 1	Combing two set of numbers to make a total	  Finding a number of objects and then counting them altogether either as a pile of a bar.	  Using pictures to represent objects and then counting them as a whole.	4 + 3 = 7 7 = 4 + 3

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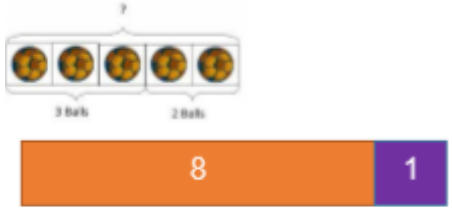
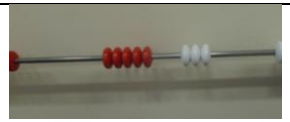
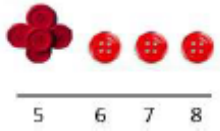
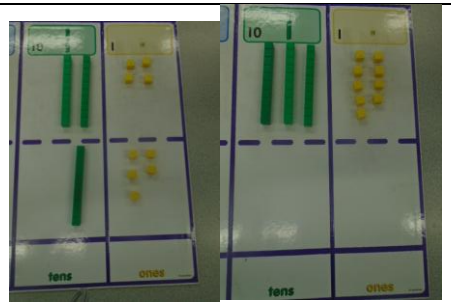
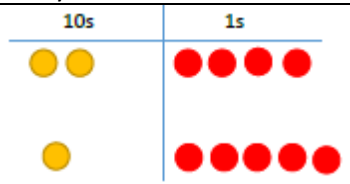
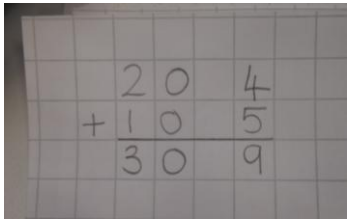
				
Step 2	Starting with the largest number and counting on to find the total.	  Starting with the largest number (without counting those beads) count on to find the total.	Use a number line to count on in ones   Finding the largest number on a number line or number square and counting on until you reach the total.	5 + 3 = 8 Using a mental method for addition, placing the largest number (5) in their head and counting on 3.
Step 3	Expanded column method without regrouping	 Using resources to show the amount of tens and one of each number and then pushing them together in order to add them.	 Use place value grids to show both numbers and then adding the one together first, followed by the tens.	 Starting with adding the ones column, moving onto the tens.

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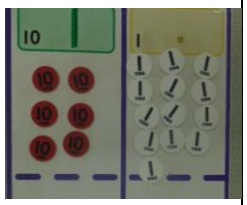
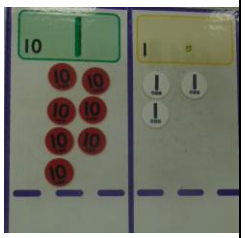
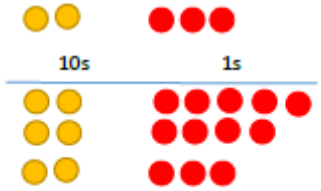
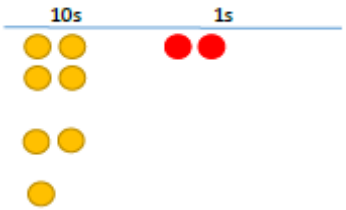
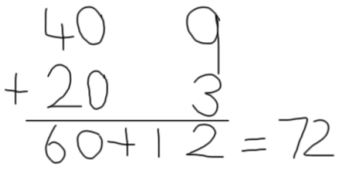
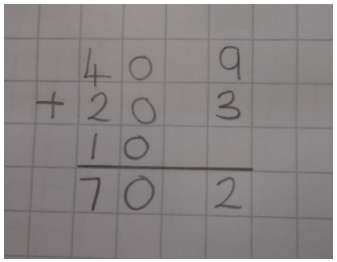
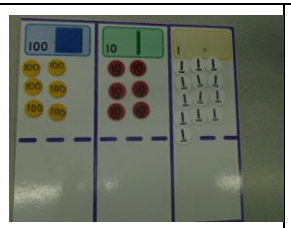
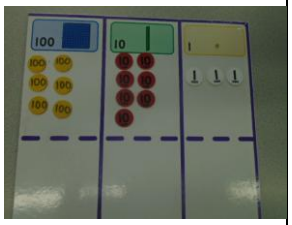
Step 4	Expanded column method with regrouping	1. Create the numbers using a place value grid.  2. Place the numbers together on the place value grid.  3. Regroup to ensure your ones column is <10. 	1.  2.  3.  1. Use pictures to represent the numbers. 2. Place the numbers together. 3. Regroup to ensure your ones column is <10.	4. Starting with the ones and adding them as a total >10. Adding the tens and ones together to find the answer.  5. Leaving a line underneath your column addition to carry your tens to the tens column. 

<table>
<tr>
<td>Step 5</td>
<td>Compact column method with regrouping</td>
<td>
1. Place both numbers onto a place value grid.


2. Regroup to ensure the tens column is <10.

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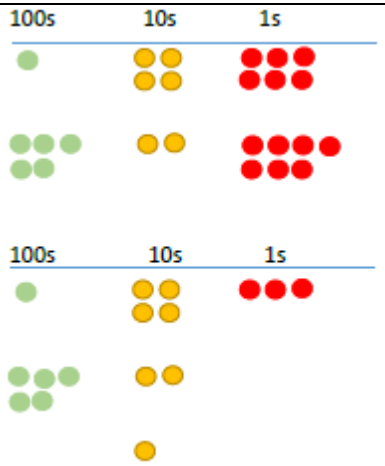

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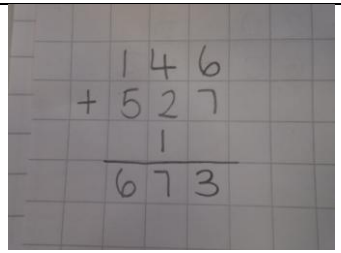
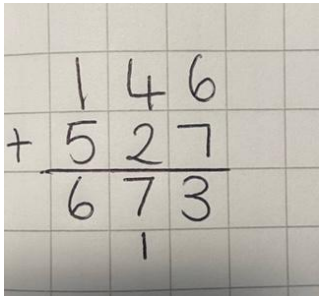
<td>


Start with your ones, carry any values above ten to the next column. Carry any values above one hundred to the next column.


The ones could also be carried like this. There is no preference to where the values are carried as long as they are added to the total.
</td>
</tr>
<tr>
<td>Step 6</td>
<td colspan="4">Consolidate the compact column method using it within the context of up to 6-digits and 3 decimal points.</td>
</tr>
</table>

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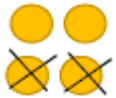
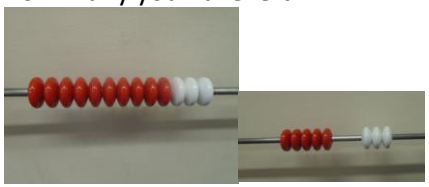
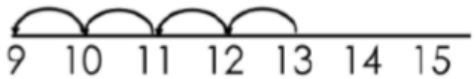
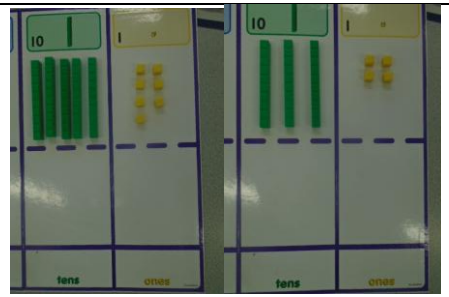
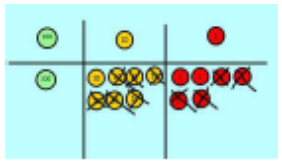
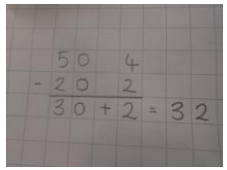
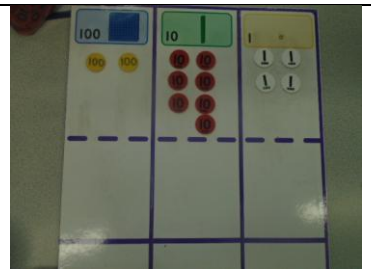
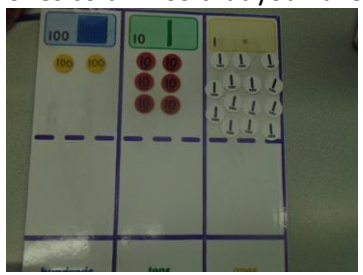
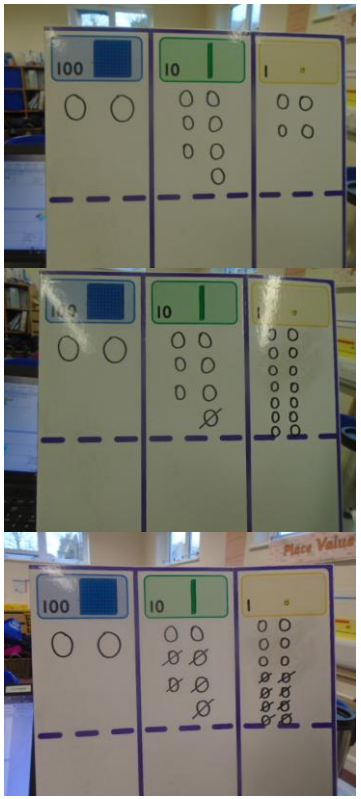
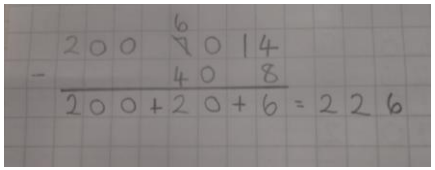
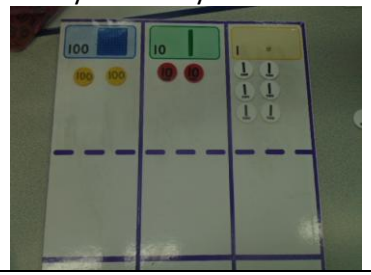
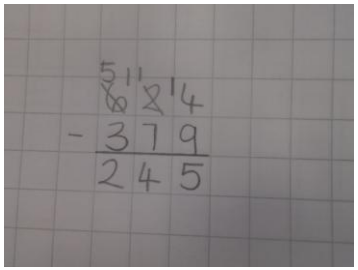
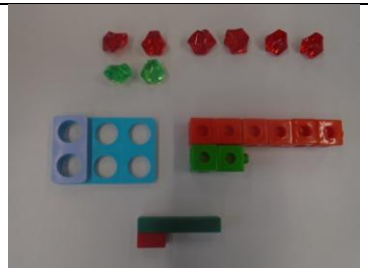
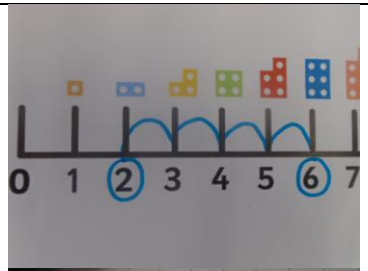
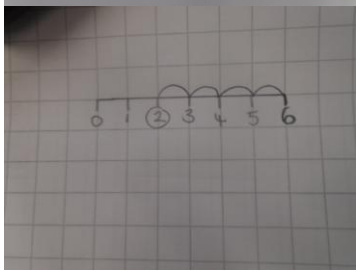
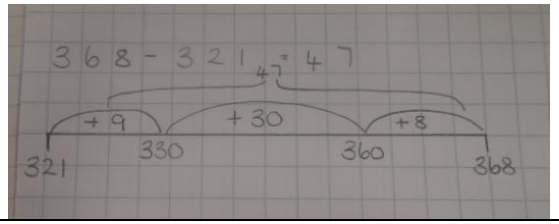
Subtraction (-) Taking away Progression	Objectives	Concrete	Pictorial	Abstract
Step 1	Taking away in ones	Place the object down in a line and subtract your number from the total. We started off with 4 and we took away 2, leaving us with 2. Therefore 4 – 2 = 2.  	Cross out drawn objects to show what has been taken away. 4 – 2 = 2 	4 – 2 = 2
Step 2	Counting back	13 – 4 Start with 13 and take away 4. Count how many you have left. 	Count back on a number line or number track  	13 – 4 = 9

Step 3	Using chunking to count back	 Place your objects into a place value gird subtract the number of ones and tens. Count how many you have left to find your answer.	Draw a number line, start with the biggest number and count back in tens and ones  Use a number square to count back in tens and then ones 	Partition the numbers using place value to ease mental subtraction. 1. 57 – 20 = 37 2. 37 – 3 = 34 57 – 23 = 34
Step 4	Expanded column method with no regrouping	 Place your objects onto the place value gird. Subtract the ones then the tens. Calculate your answer from what you have left.	Draw out your place value grid and place in the numbers partitioning into place value. Subtract by crossing the representations out. Calculate your answer by what you have left in your place value grid.  	Expand your subtraction using place value. Start with your ones and subtract the bottom number from the top number. 54 – 22 = 32 

Step 5	Expanded column method with regrouping	 Step 1: Start with place your counters into the place value grid. Step 2: Start with your ones and subtract the bottom number from the top number. Step 3: If you top number is smaller, you need to regroup. Move a ten to your ones column so that you have 14 ones.  Now complete your subtraction.	 Follow the same process as the concrete but using draws to represent the numbers. Cross out to show you have subtracted.	274 – 48 = 226  Follow the same process using expanded column method. Always starting with your ones and regrouping if needed.

		Step 4: follow step two and three again until you finish your subtraction. 		
Step 6	Written compact column method with regrouping	N/A	N/A	624 – 379 = 245  Similar to expanded column method, ensure children are aware of the place value of each digit. H, T, O can be used as headings to help them with this.
Step 7	Consolidate the compact column method using it within the context of up to 6-digits and 3 decimal points.			

Subtraction (-) Finding the difference Progression	Objectives	Concrete	Pictorial	Abstract
Step 1	Find the difference between two numbers by counting in ones.	 Children to start off at the smaller number and count on to the larger number. The numbers in between is the difference.	  Children can use number lines to start at the smaller number and count on to the larger number. The amount of jumps is the difference.	Finding the difference between 6 and 2. ___ + 2 = 6 6 – 2 = 4

Step 2	Find the difference between two numbers by counting in chunks.	 Start off at the smaller number as use known chunks to aid counting (jumps of 2,5,10). Count the chunks together to find your answer.	 Children to start at the smallest number and count on in chunks until they reach the largest. Add together the chunks to find the difference.	Finding the difference between 32 and 25 using a mental method, applying the concrete and pictorial strategies mentally. ___ + 25 = 32 32 – 25 = Putting 25 in their head and counting on until they reach 32. 26, 27, 28, 29, 30, 31, 32 7 numbers therefore 32 – 25 = 7
Step 3	Using counting on (sometimes called frog method) to find the difference between two numbers which are close together.	N/A	Start with the smallest number, count on to the next ten, then count in multiples of 10 and then any ones left. Add the jumps together to find the difference. 	Finding the difference between 368 and 321 using a mental method, applying the concrete and pictorial strategies mentally. 368 – 321 = 47
Step 4	Consolidate ‘frog’ method using it with decimals and 6-digit numbers in a range of contexts including time and measure.			

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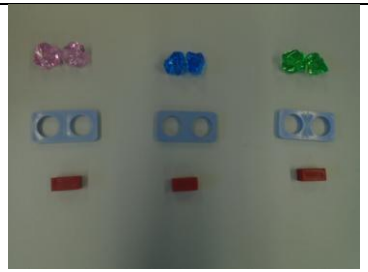
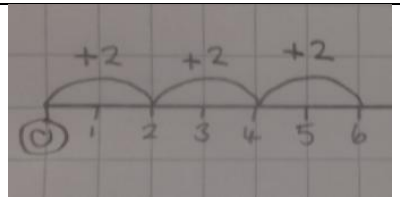
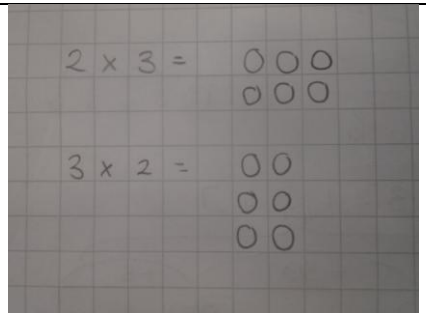
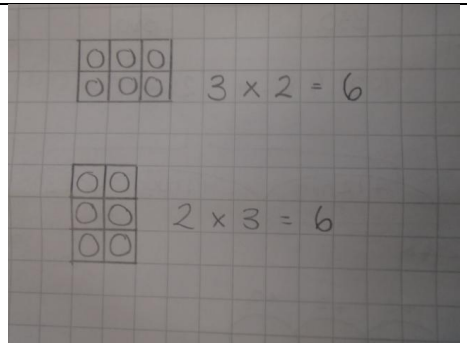
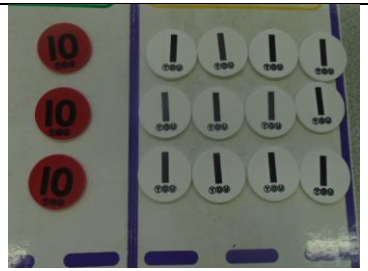
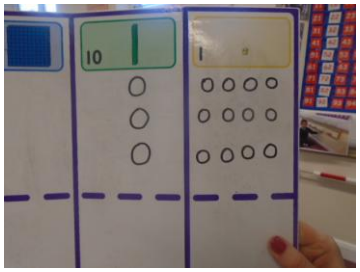
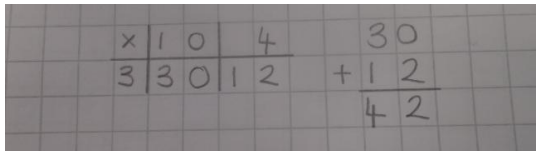
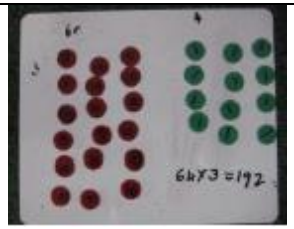
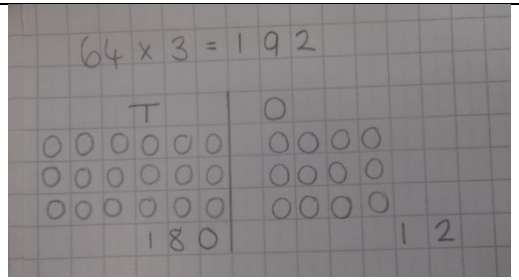
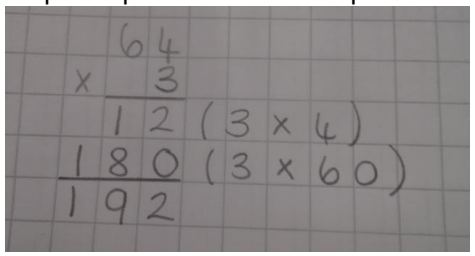
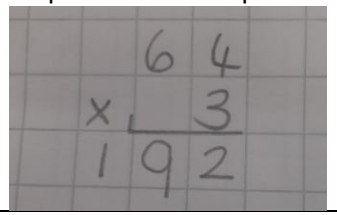
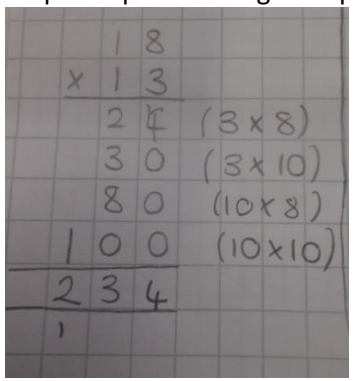
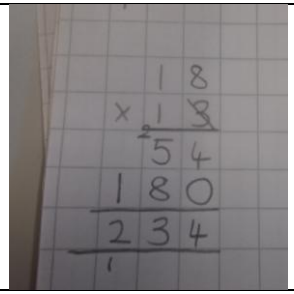
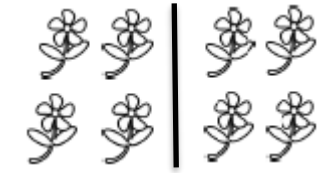
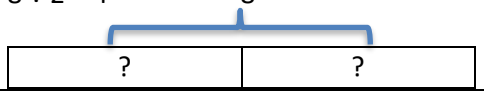
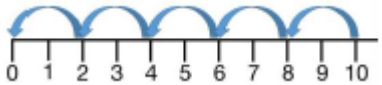
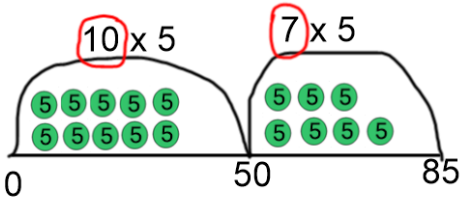
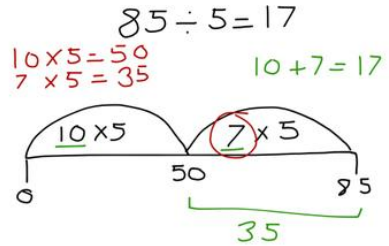
Multiplication (X) Progression	Objectives	Concrete	Pictorial	Abstract
Step 1	To introduce the 'times' using repeated addition (finding 'lots of' a number).	 "How many lots of 2 do we have?"	 Starting at 0 and count in jumps of the multiple i.e. 2 as we are multiplying by 2.	3 lots of 2 2 + 2 + 2 = 6
Step 2	To use arrays to represent multiplication	 Placing physical resources aligned correctly to represent multiplication i.e. 3 lots of 2 or 2 lots of 3.		2 x 3 = 6 Using their knowledge of repeated addition and times tables to calculate the answer mentally.

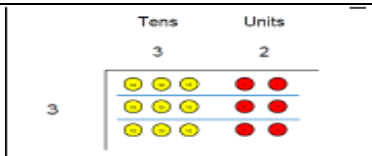
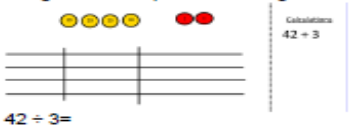
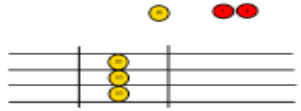
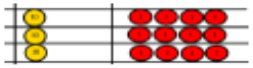
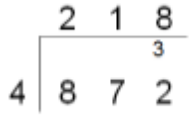
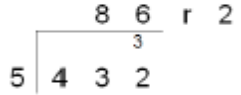
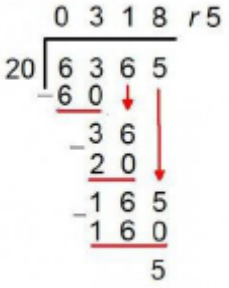
			 Drawing objects to represent multiplication ensuring they are aligned correctly to show the given multiplication.	
Step 3	To use grid method as a method of multiplication	 Use physical objects to represent tens and one. i.e. 14 x 3 – there is 14 three times to aid multiplication.	 Same method as concrete but using drawings to represent numbers.	14 x 3 = 42  Step 1: Draw a grid (the size will depend on your number for 2-digit numbers you need 3 columns). Step 2: Partition your numbers using place value. Place your multiplier into the second row on the first column. Step 3: Multiply each number and place the answer into the correct place in the grid.

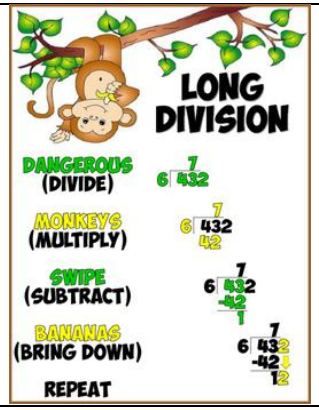
				Step 4: Add the two numbers together to find the answer.
Step 4	Short multiplication			Step 1: Expanded short multiplication  Step 2: a more compact method 
Step 5	Long multiplication	N/A	N/A	Step 1: Expanded long multiplication  Step 2: A more compact method

				
Step 6	To consolidate short and long multiplication in a variety of contexts including problem solving.			

Division (÷) Progression	Objectives	Concrete	Pictorial	Abstract
Step 1	To be able to understanding sharing as a method of division.	I had 8 cubes and I shared them between 2 people. 	 8 ÷ 2 = 4 	8 ÷ 2 = 4
Step 2	To be able to understand grouping as a method of division.	 Creating equal sized groups from the total (10). i.e. 'How many groups of two can you make? 10 ÷ 2 = 5 (because you can make 5 groups of 2).	  Using pictures or a number line to count equal groups.	10 ÷ 2 = 5

Step 3	To be able to divide on a number line using chunking in the form of repeated addition	N/A	 10 + 7 = 17 85 ÷ 5 = 17 Using counters to represent 5s.	12 ÷ 4 = 3  Starting at 0, count on in chunks of that multiple. Write the corresponding multiplication statement to add up at the end.

Step 4	Short division (bus stop)	N/A	 Use place value counters to divide using the bus stop method alongside  42 ÷ 3= 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.  We exchange this ten for ten ones and then share the ones equally among the groups.  We look how much in 1 group so the answer is 14.	Begin with divisions that divide equally with no remainder.  Move onto divisions with a remainder.  Finally move into decimal places to divide the total accurately. 
Step 5	To use long division.	N/A	N/A	

				
Step 6	To consolidate short and long division in a variety of contexts including problem solving.			