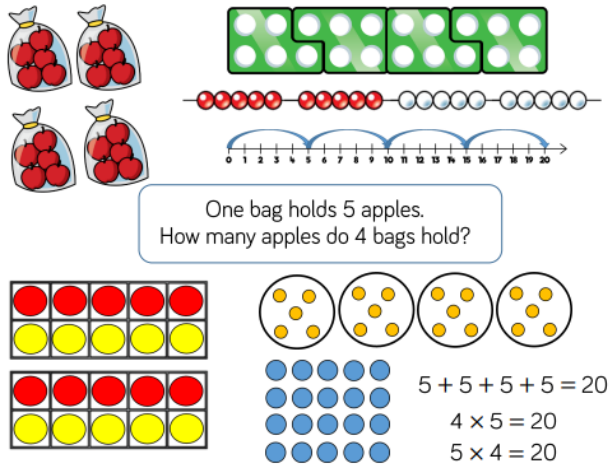
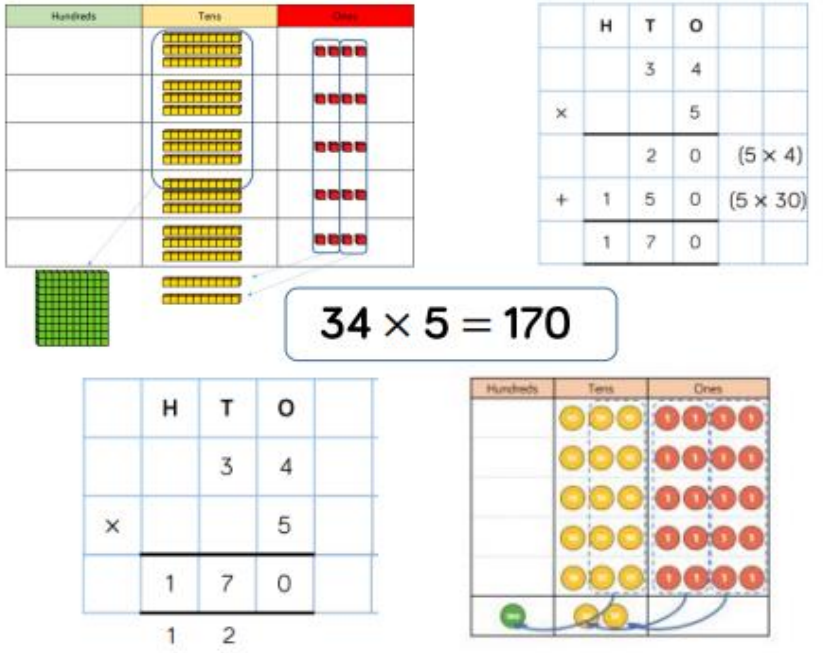
Maths Calculation Progression and Policy – Multiplication and Division (including Times Tables)

<table>
<tr><th colspan="3">Multiplication</th></tr>
<tr><th>Skill</th><th>Information</th><th>Representations</th></tr>
<tr><td>Year 1/2:
Solve 1-step problems using multiplication</td><td>Children represent multiplication as repeated addition in many different ways.

In Year 1, children use concrete and pictorial representations to solve problems. They are not expected to record formally.

In Year 2, children are introduced to the multiplication symbol.</td><td> 
</td></tr>
<tr><td>Year 3/4:
Multiply 2-digit numbers by 1-digit numbers</td><td>Teachers may decide to first look at the expanded column method before moving on to the short multiplication method.

The place value counters should be used to support the understanding of the method rather than supporting multiplication, as children should use times table knowledge.</td><td> 
</td></tr>
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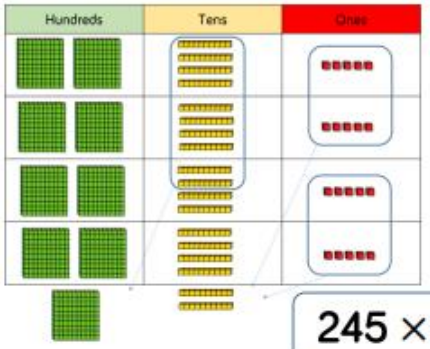
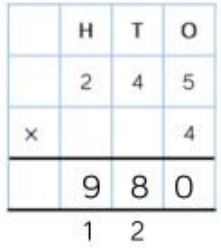
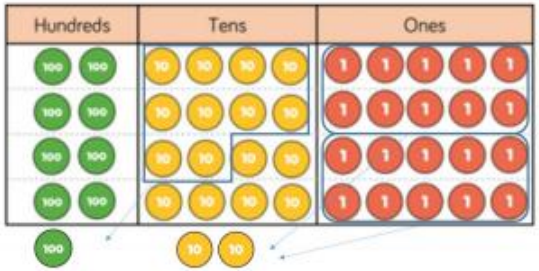
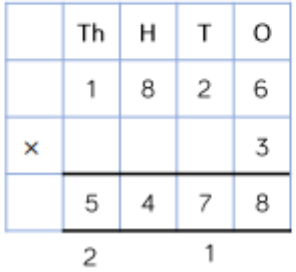
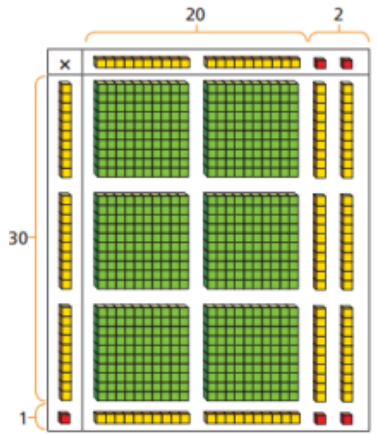
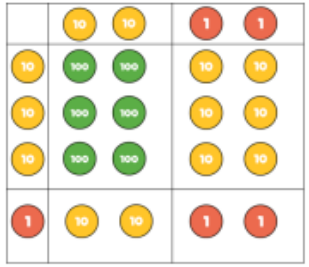
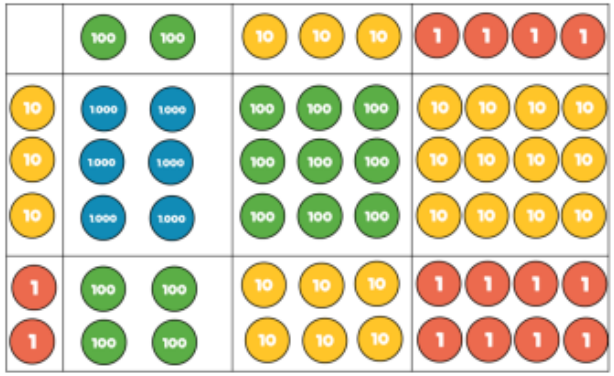
Year 3/4: Multiply 3-digit numbers by 1-digit numbers	When moving to 3-digit by 1-digit multiplication, encourage children o move towards the short, formal written method. Base 10 and place value counters continue to support the understanding of the written method. Limit the number of exchanges needed in questions and move children away from resources when multiplying larger number.	  $245 \times 4 = 980$ 
Year 5: Multiply 4-digit numbers by 1-digit numbers	When multiplying 4-digit numbers, place value counters are the best manipulative to use to support children in their understanding of the formal written method. If children are multiplying larger numbers and struggling with their times tables, encourage the use of multiplication grids so children can focus on the use of the written method.	 $1{,}826 \times 3 = 5{,}478$ 

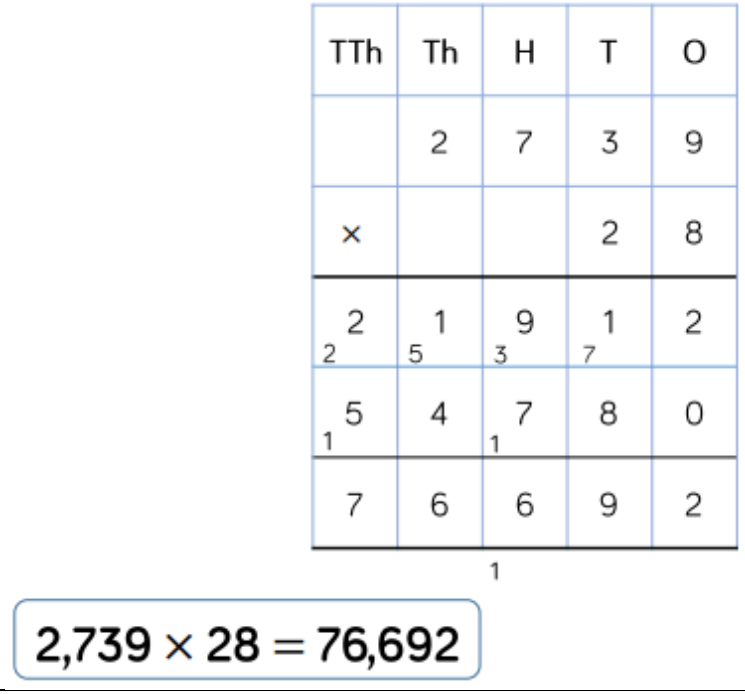
Year 5: Multiply 2-digit numbers by 2-digit numbers	When multiplying a multi-digit number by 2-digits, use the area model to help children understand the size of the numbers they are using. This links to finding the area of a rectangle by finding the space covered by the Base 10. The grid method matches the area model as an initial written method before moving on to the formal written multiplication method.	  $22 \times 31 = 682$
Year 5: Multiply 3-digit numbers by 2-digit numbers	Children can continue to use the area model when multiplying 3-digits by 2-digits. Place value counters become more efficient to use but Base 10 can be used to highlight the size of numbers. Encourage children to move towards the formal written method, seeing the links with the grid method.	 $234 \times 32 = 7{,}488$

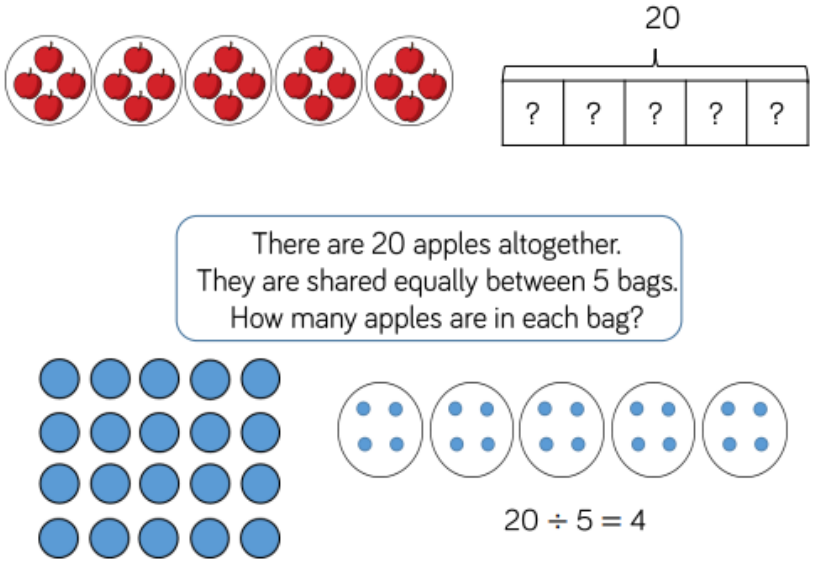
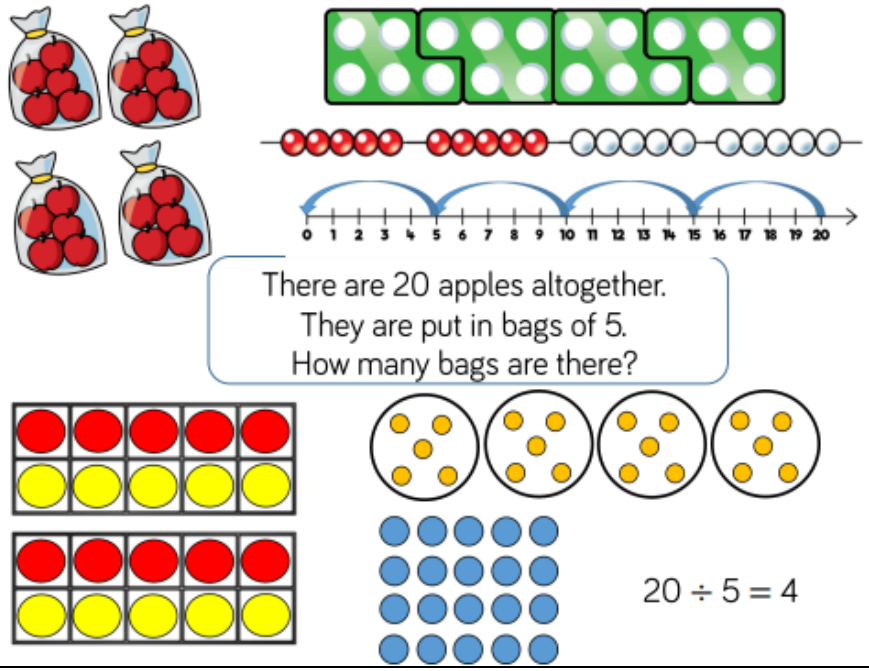
×	20	2
30	600	60
1	20	2

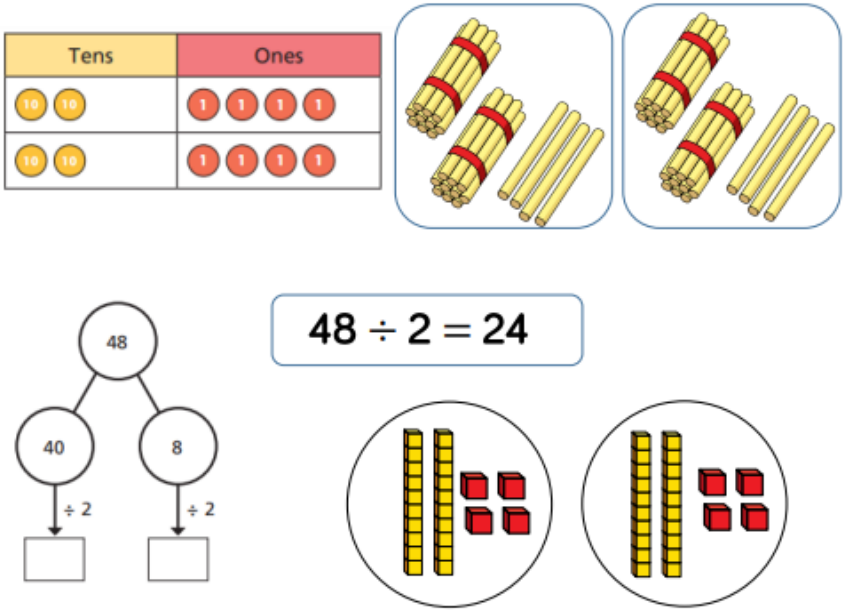
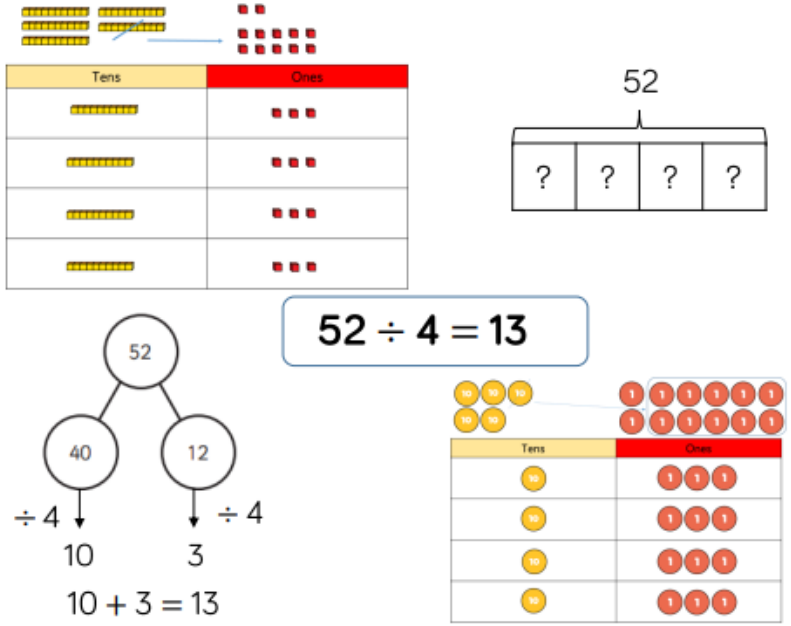
	H	T	O
		2	2
×		3	1
		2	2
	6	6	0
	6	8	2

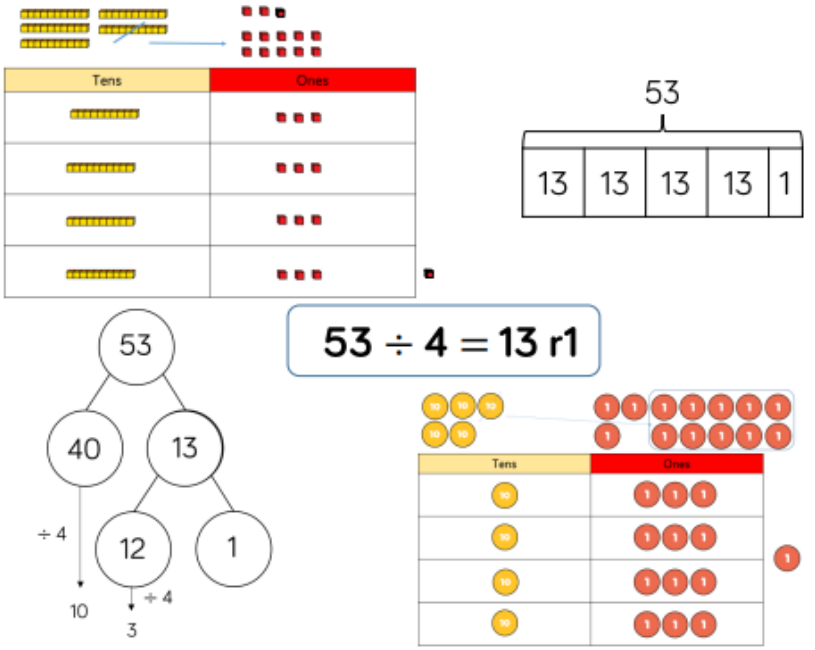
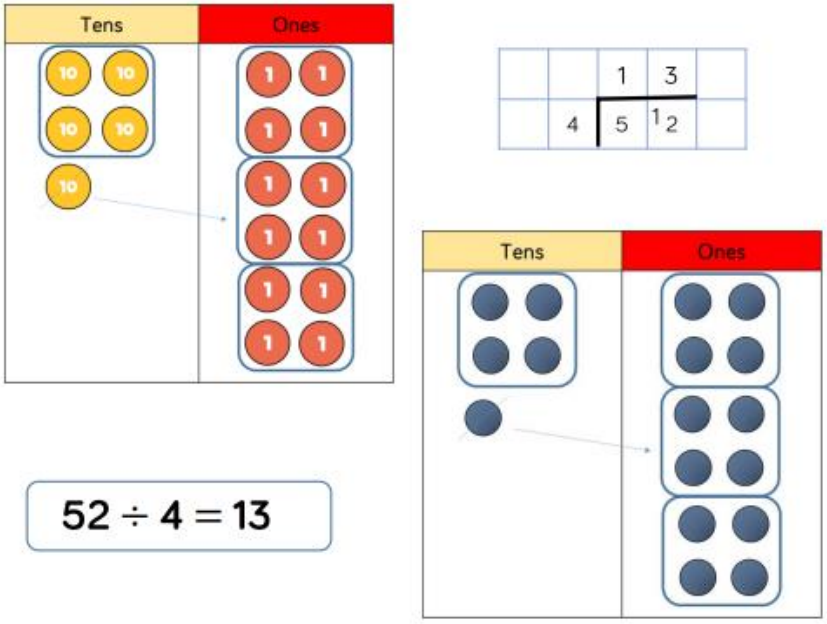
Th	H	T	O
	2	3	4
×		3	2
	4	6	8
$^{1}1^{7}$	$^{1}0$	2	0
7	4	8	8

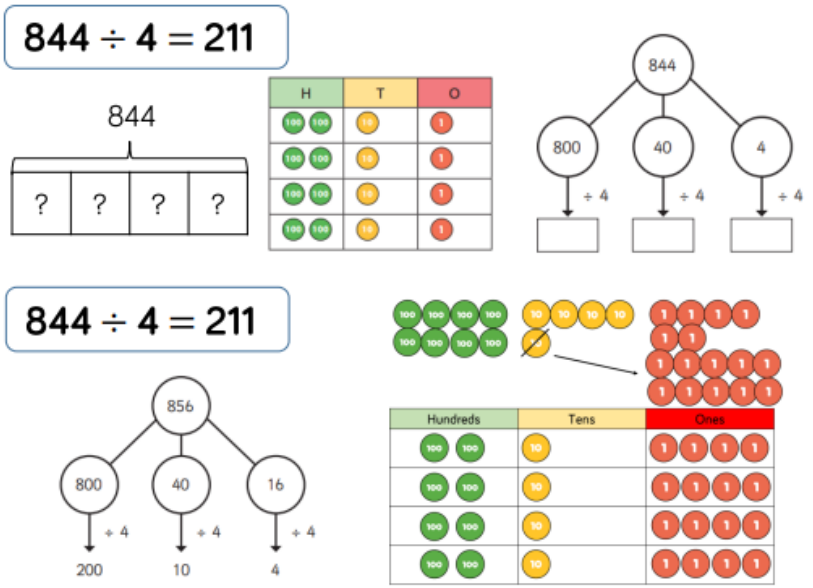
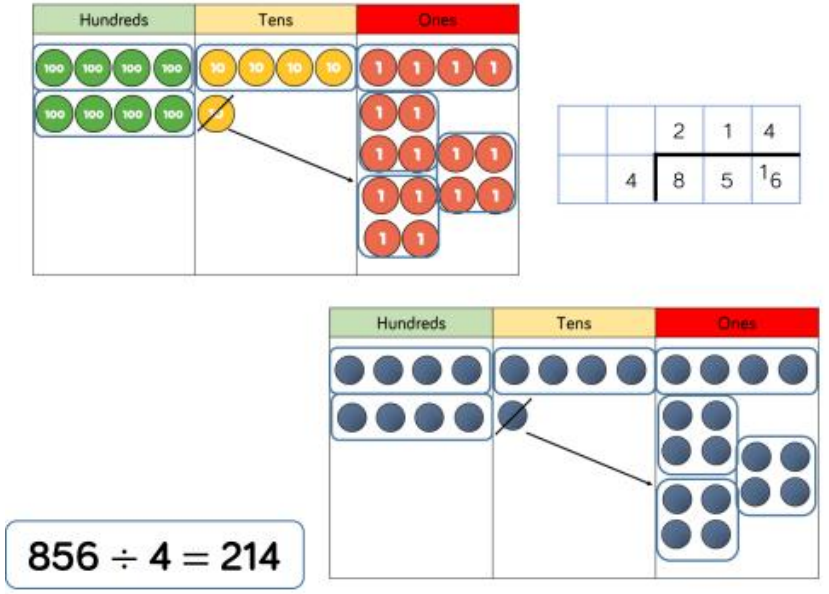
×	200	30	4
30	6,000	900	120
2	400	60	8

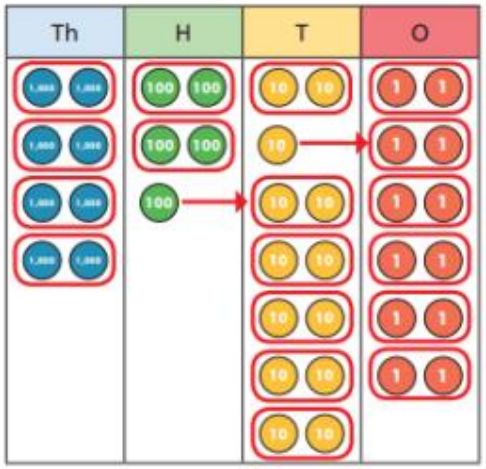
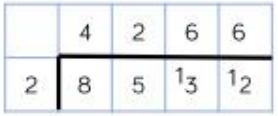
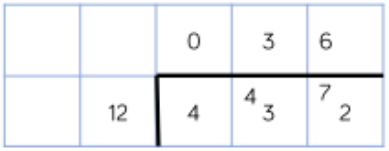
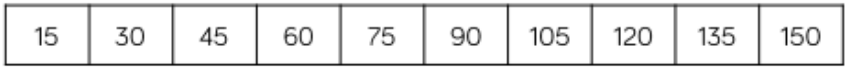
Year 5/6: Multiply 4-digit numbers by 2-digit numbers.	When multiplying 4-digits by 2-digits, children should be confident In the written method. If they are still struggling with times tables, provide multiplication grids to support when they are focusing on the use of the method. Consider where exchanged digits are placed and make sure this is consistent.	

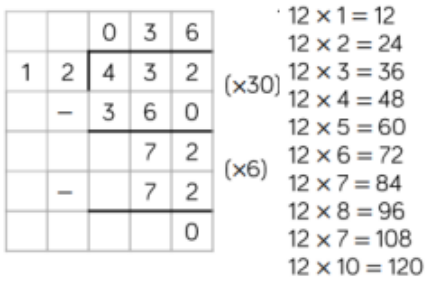
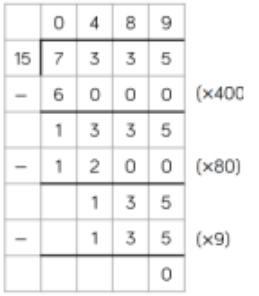
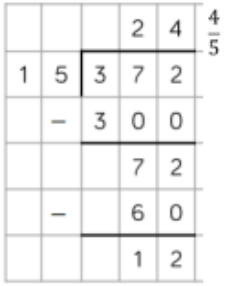
Division		
Skill	**Information**	**Representations**
Year 1/2: Solve 1-step problems using multiplication (sharing)	Children solve problems by sharing amounts into equal groups. In Year 1, children use concrete and pictorial representations to solve problems. They are not expected to record division formally. In Year 2, children are introduced to the division symbol.	
Year 1/2: Solve 1-step problems using division (sharing)	Children solve problems by grouping and counting the number of groups. Grouping encourages children to count in multiples and links to repeated subtraction on a number line. They can use concrete representations in fixed groups such as number shapes which helps to show the link between multiplication and division.	

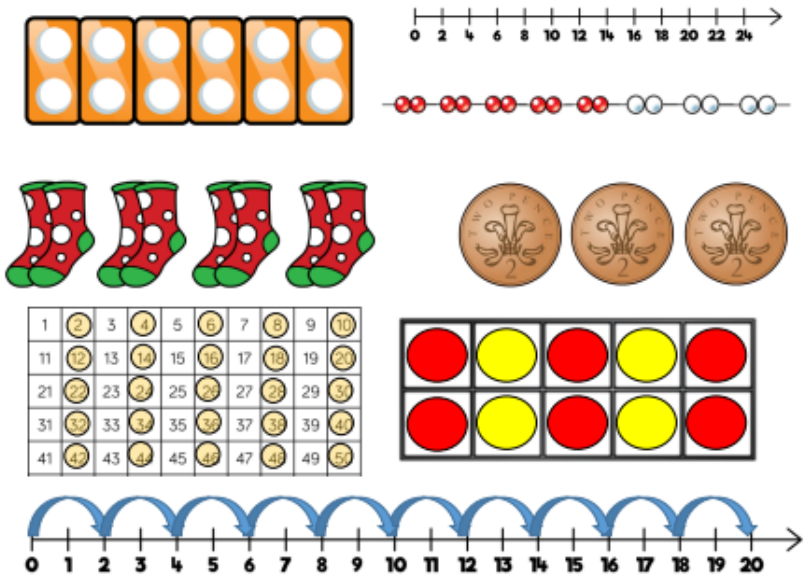
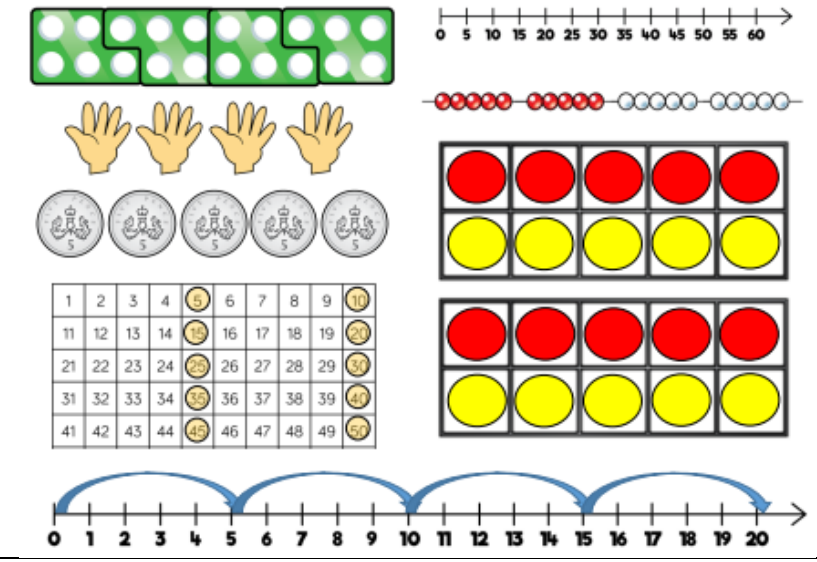
Year 1/2: Divide 2-digits by 1-digit (sharing with no exchange)	When dividing larger numbers, children can use manipulatives that allow them to partition into tens and ones. Straws, Base 10 and place value counters can all be used to share numbers into equal groups. Part-whole models can provide children with a clear written method that matches the concrete representation.	
Year 3/4: Divide 2-digits by 1-digit (sharing with exchange)	When dividing numbers involving an exchange, children can use Base 10 and place value counters to exchange one ten for ten ones. Children should start with the equipment outside the place value grid before sharing tens and once equally between the rows. Flexible partitioning in a part-whole model supports this method.	

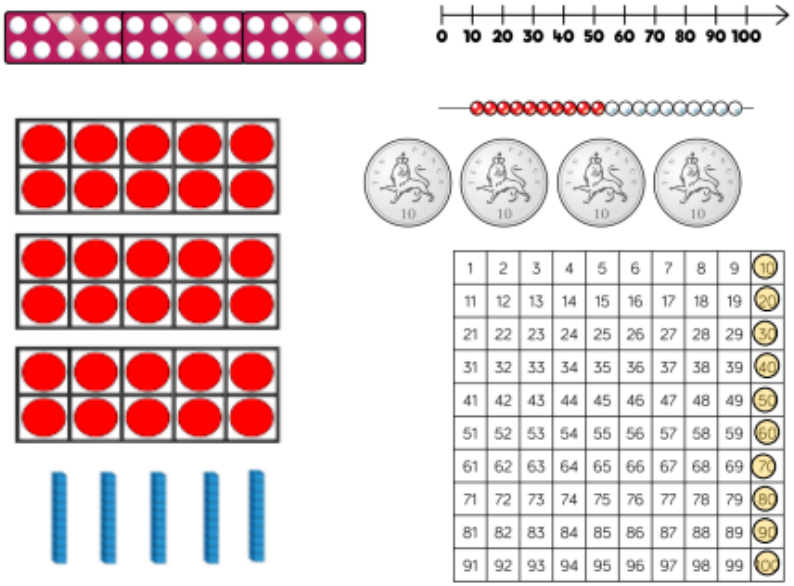
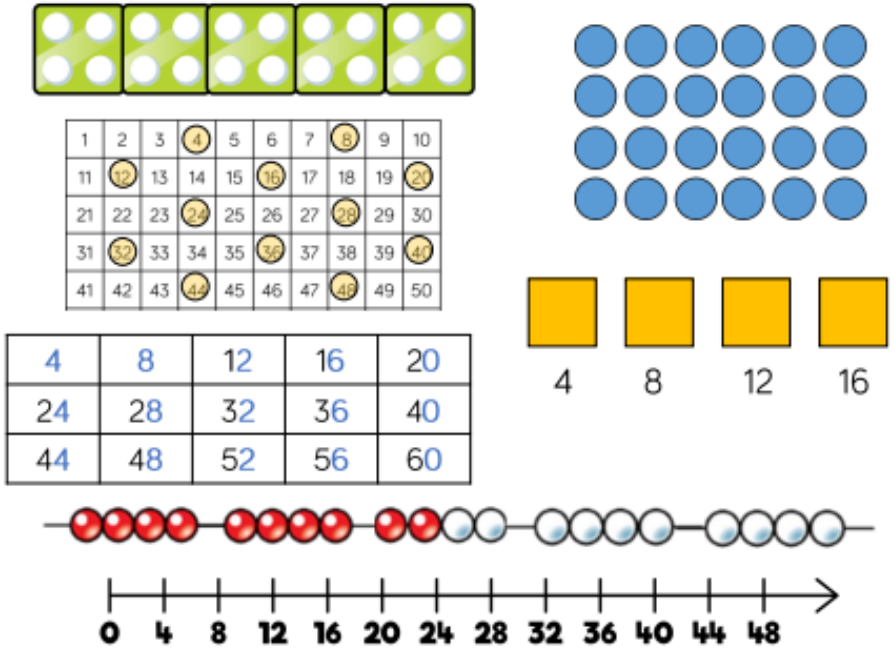
Year 3/4: Divide 2-digits by 1-digit (sharing with remainders)	When dividing numbers with remainders, children can use Base 10 and place value counters to exchange one ten for ten ones. Starting with the equipment outside the place value grid will highlight remainders, as they will be left outside the grid once the equal groups have been made. Flexible partitioning in a part-whole model supports this method.	
Year 4/5: Divide 2-digits by 1-digit (grouping)	When using the short division method, children use grouping. Starting with the largest place value, they group by the divisor. Language is important here. Children should consider 'How many groups of 4 tens can we make?' and 'How many groups of 4 ones can we make?' Remainders can also be seen as they are left ungrouped.	

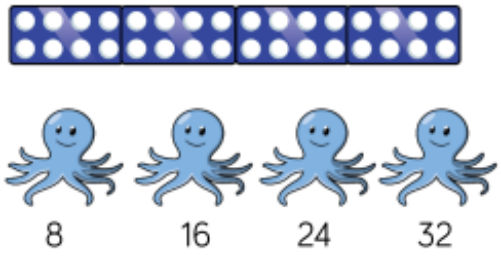
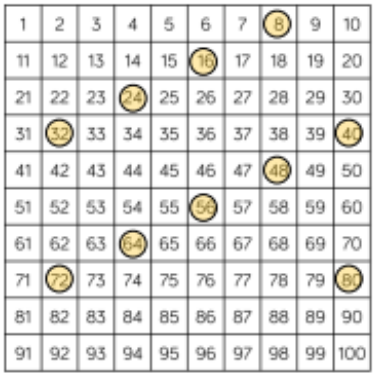
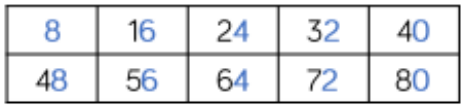
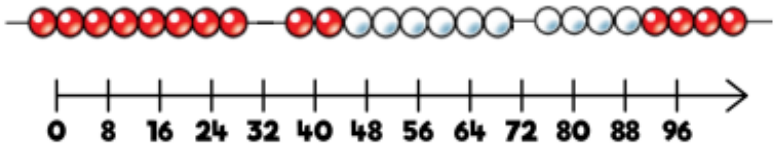
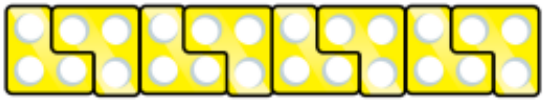
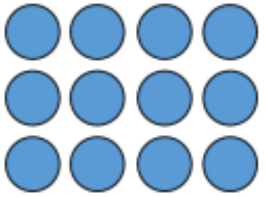
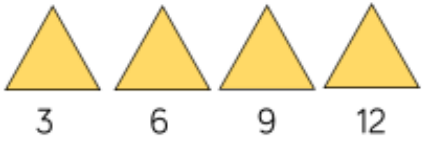
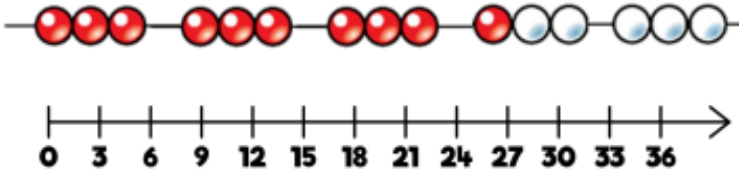
Year 4: Divide 3-digits by 1-digit (sharing)	Children can continue to use place value counters to share 3-digit numbers into equal groups. Children should start with the equipment outside the place value grid before sharing the hundreds, tens and ones equally between the rows. This method can also help to highlight remainders. Flexible partitioning in a part-whole model supports this method.	
Year 5: Divide 3-digits by 1-digit (grouping)	Children can continue to use grouping to support their understanding if short division when dividing a 3-digit number by a 1-dgit number. Place value counters or plain counters can be used on a place value grid to support this understanding. Children can also draw their own counters and group them through a more pictorial method.	

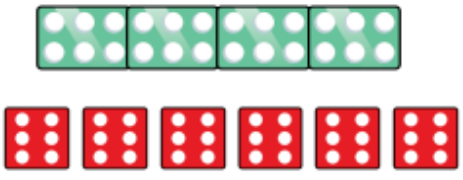
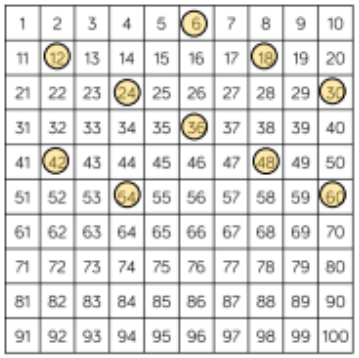
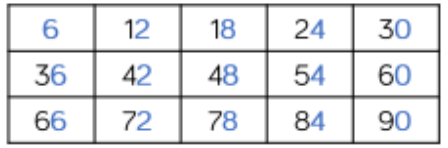
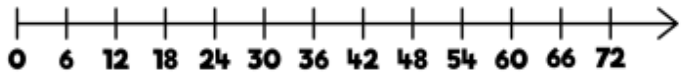
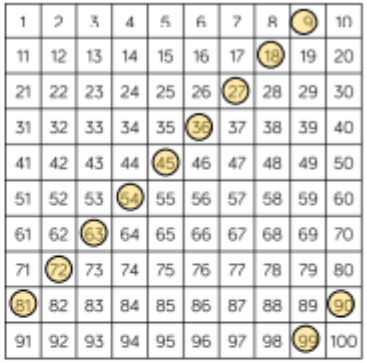
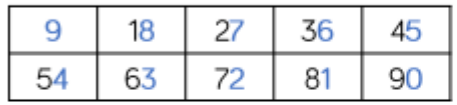
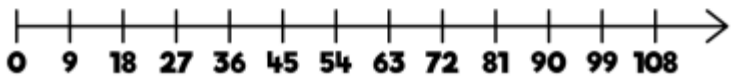
Year 5: Divide 4-digits by 1-digit (grouping)	Place value counters or plain counters can be used on a place value grid to support children to divide 4-digits by 1-digit. Children can also draw their own counters and group them through a more pictorial method. Children should be encourage to move away from the concrete and pictorial when dividing numbers with multiple exchanges.	  8,532 ÷ 2 = 4,266
Year 6: Divide multi digits by 2-digits (short division)	When children begin to divide up to 4-digits by 2-digits, written methods become the most accurate as concrete and pictorial representations become less effective. Children can write out multiples to support their calculations with larger remainders. Children will also solve problems with remainders where the quotient can be rounded as appropriate.	 432 ÷ 12 = 36 7,335 ÷ 15 = 489 

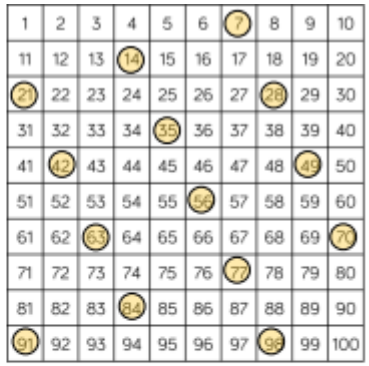
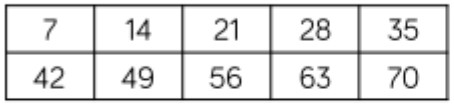
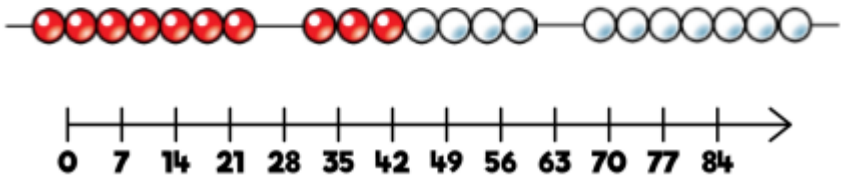
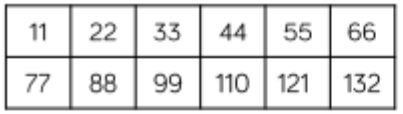
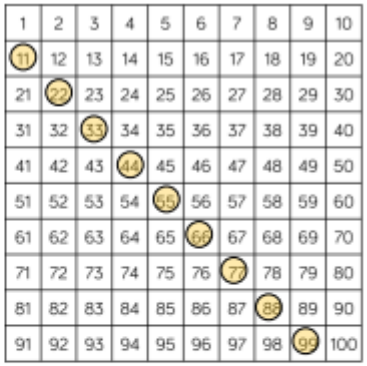
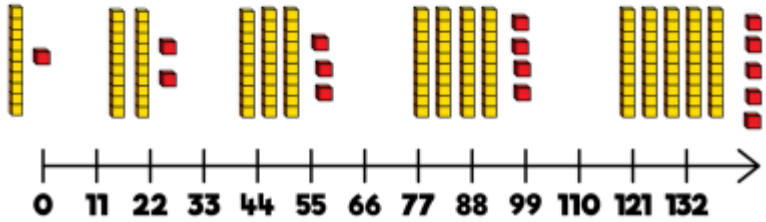
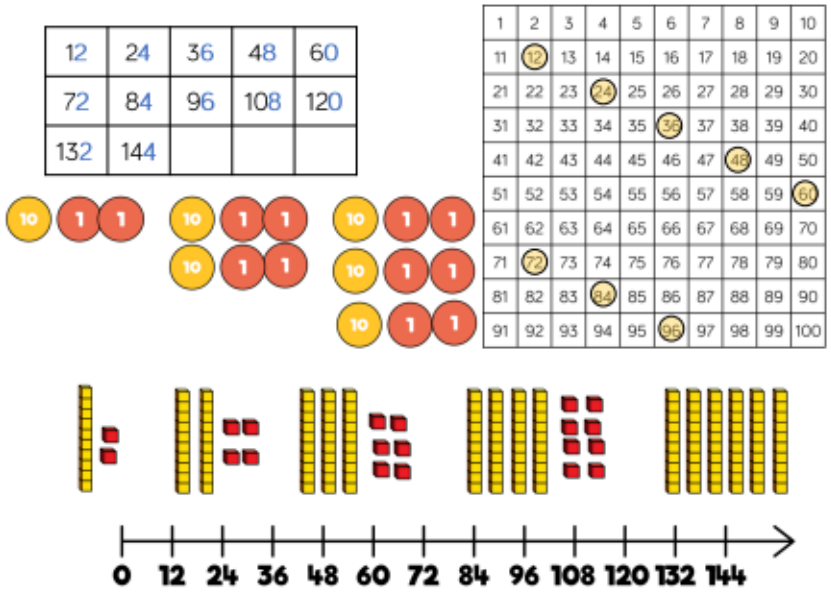
Year 6: Divide multi-digits by 2-digits (long division)	Children can also divide by 2-digit numbers using long division. Children can write out multiples top support their calculations with larger remainders. Children will also solve problems with remainders where the quotient can be rounded as appropriate.	 (×30) (×6) 12 × 1 = 12 12 × 2 = 24 12 × 3 = 36 12 × 4 = 48 12 × 5 = 60 12 × 6 = 72 12 × 7 = 84 12 × 8 = 96 12 × 7 = 108 12 × 10 = 120 **432 ÷ 12 = 36** **7,335 ÷ 15 = 489**  (×400) (×80) (×9) 1 × 15 = 15 2 × 15 = 30 3 × 15 = 45 4 × 15 = 60 5 × 15 = 75 10 × 15 = 150
Year 6: Divide multi-digits by 2-digits (long division)	When a remainder is left at the end of a calculation, children can either leave it as a remainder or convert it to a fraction. This will depend on the context of the question. Children can also answer questions where the quotient needs to be rounded according to the context.	**372 ÷ 15 = 24 r12** 1 × 15 = 15 2 × 15 = 30 3 × 15 = 45 4 × 15 = 60 5 × 15 = 75 10 × 15 = 150  **372 ÷ 15 = 24 4/5**

Times Tables		
Skill	**Information**	**Representations**
2 Times Tables	Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or a hundred square. Look for patterns in the two times table, using concrete manipulatives to support. Notice how all the numbers are even and there is a pattern in the ones. Use different models to develop fluency.	
5 Times Tables	Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or a hundred square. Look for patterns in the five times table, using concrete manipulatives to support. Notice the pattern in the ones as well as highlighting the odd, even, odd pattern.	

10 Times Tables	Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or a hundred square. Look for patterns in the ten times table, using concrete manipulatives to support. Notice the pattern in the digits – the ones are always 0, and the tens increase by 1 ten each time.	
4 Times Tables	Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or a hundred square. Look for patterns in the four times table, using concrete manipulatives to support. Make links to the 2 times table, seeing how each multiple is double the twos. Notice the pattern in the ones within each group of five multiples. Highlight that the multiples are even using number shapes to support.	

8 Times Tables	Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or a hundred square. Look for patterns in the eight times table, using concrete manipulatives to support. Make links to the 4 times table, seeing how each multiple is double the fours. Notice the pattern in the ones within each group of five multiples. Highlight that all the multiples are even using number shapes to support.	   
3 Times Tables	Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or a hundred square. Look for patterns in the three times table, using concrete manipulatives to support. Notice the odd, even, odd, even patter using number shapes to support. Highlight the pattern using a hundred square.	   

6 Times Tables	Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or a hundred square. Look for patterns in the six times table, using concrete manipulatives to support. Make links to the 3 times tables, seeing how each multiple is double the threes. Notice the pattern in the ones within each group of five multiples. Highlight that all the multiples are even using number shapes to support.	   
9 Times Table	Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or a hundred square. Look for patterns in the nine times table, using concrete manipulatives to support. Notice the pattern in the tens and ones using the hundred square to support as well as noting the odd, even pattern within the multiples.	   

7 Times Table	Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or a hundred square. The seven times table can be trickier to learn die to the lack of obvious pattern in the numbers, however they already know several facts due to commutativity. Children can still see the odd, even pattern in the multiples using number shapes to support.	    0 7 14 21 28 35 42 49 56 63 70 77 84
11 Times Table	Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or a hundred square. Look for patterns in the three times table, using concrete manipulatives to support. Notice the pattern in the tens and ones using the hundred square to support. Also consider the pattern after crossing 100.	   0 11 22 33 44 55 66 77 88 99 110 121 132

12 Times Table	Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or a hundred square. Look for patterns in the three times table, using concrete manipulatives to support. Make links to the 6 times table, seeing how each multiple is double the sixes. Notice the pattern in the ones within each group of five multiples. The hundred square can support in highlighting this pattern.