Hollywell Primary School Calculation Policy

Children develop the core ideas that underpin all calculation. They begin by connecting calculation with counting on and counting back, but they should learn that understanding wholes and parts will enable them to calculate efficiently and accurately, and with greater flexibility. They learn how to use an understanding of 10s and 1s to develop their calculation strategies, especially in addition and subtraction.

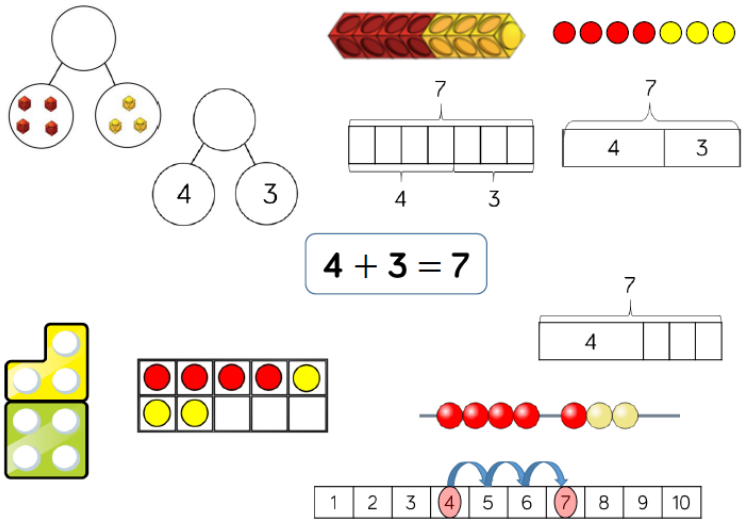
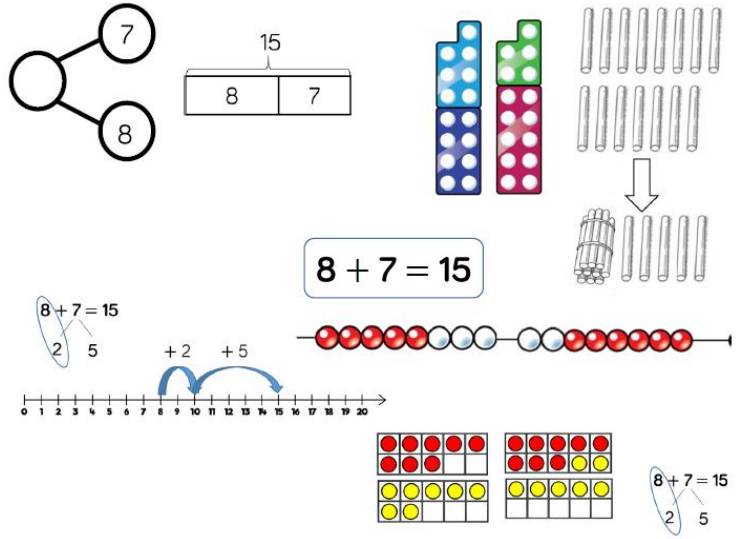
In Years 3 and 4, children develop the basis of written methods by building their skills alongside a deep understanding of place value. They should use known addition/subtraction and multiplication/division facts to calculate efficiently and accurately, rather than relying on counting. Children use place value equipment to support their understanding, but not as a substitute for thinking.

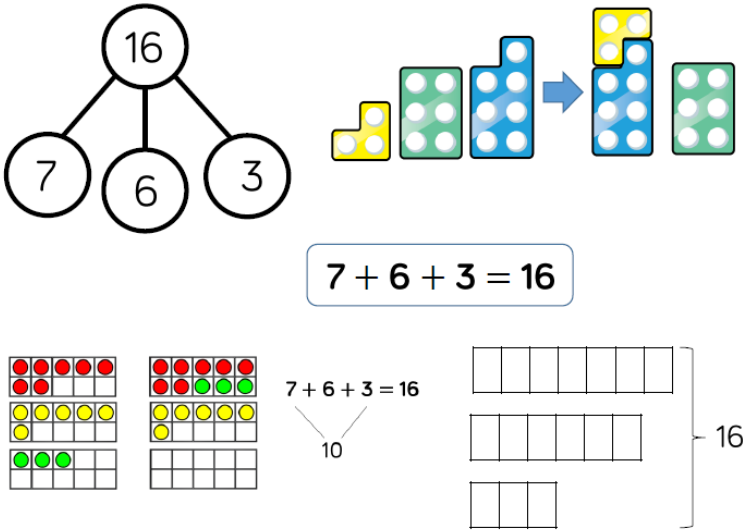
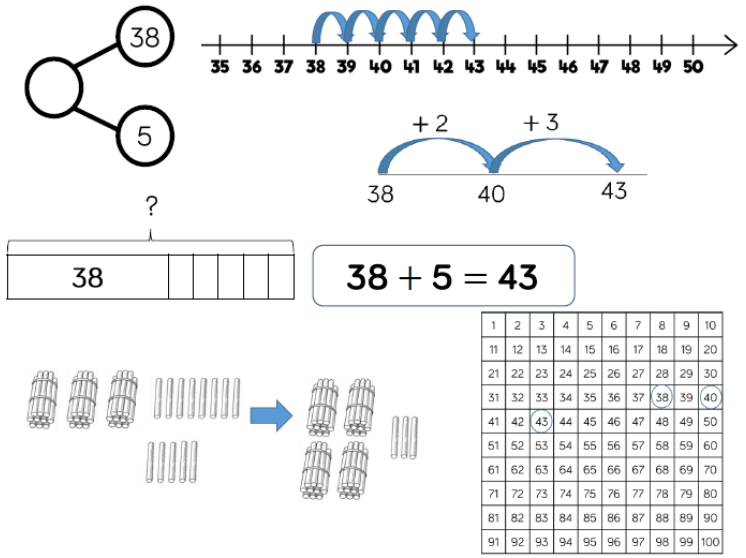
In upper Key Stage 2, children build on secure foundations in calculation, and develop fluency, accuracy and flexibility in their approach to the four operations. They work with whole numbers and adapt their skills to work with decimals, and they continue to develop their ability to select appropriate, accurate and efficient operations.

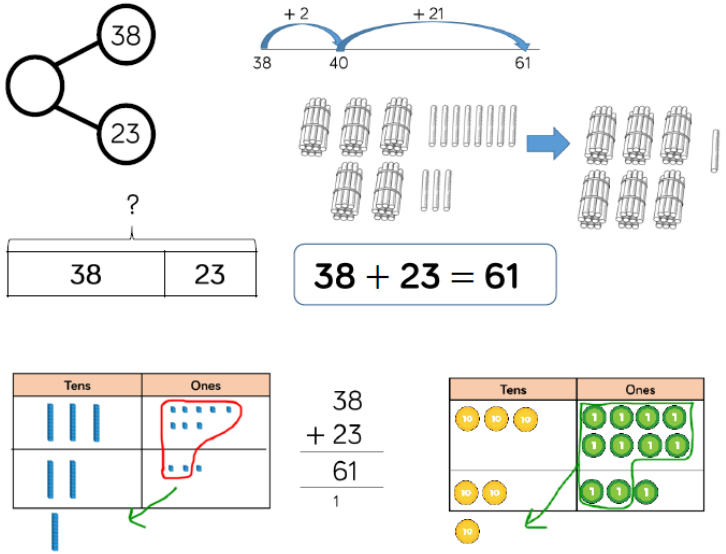
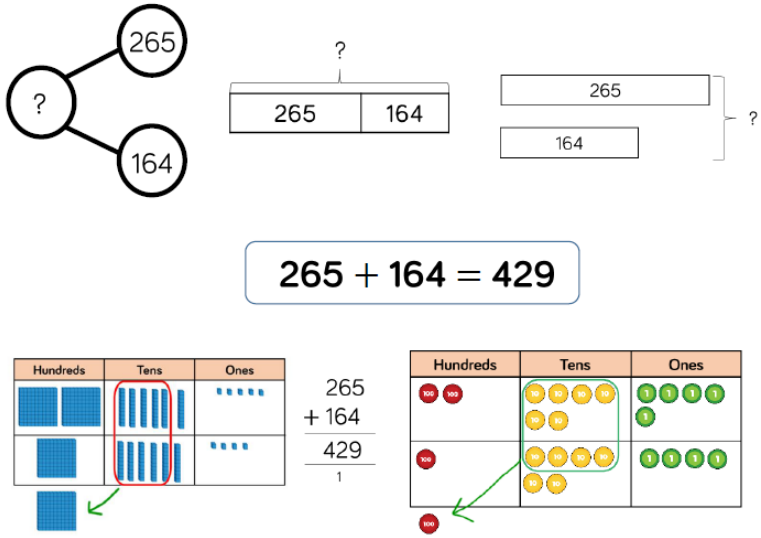
	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Addition	**Find a total number of items in two groups by counting all of them.** **Finding one more than a given number.** **Number bonds using quantities and objects to add two single numbers.** **Counting on.**	**Adding two 1-digit numbers to 10** *Part-whole model* *Bar model* *Number shapes* *Tens frames (within 10)* *Beed strings (10)* *Number tracks* **Add 1 and 2-digit numbers to 20.** *Part-whole model* *Bar model* *Number shapes* *Tens frames (within 20)* *Beed strings (20)* *Number tracks* *Number lines (labelled)* *Straws*	**Adding three 1-digit numbers.** *Part-whole model* *Bar model* *Tens frames (within 20)* *Number shapes* **Add 1 and 2-digit numbers to 100.** *Part-whole model* *Bar model* *Number lines (labelled)* *Number lines (blank)* *Straws* *Hundred square* **Add two 2-digit numbers** *Part-whole model* *Bar model* *Number line (blank)* *Straws* *Base 10* *Place value counters* *Column addition*	**Add with up to 3-digits** *Part-whole model* *Bar model* *Base 10* *Place value counters* *Column addition*	**Add with up to 4-digits** *Part-whole model* *Bar model* *Base 10* *Place value counters* *Column addition*	**Add with more than 4-digits** *Part-whole model* *Bar model* *Place value counters* *Column addition* **Add with up to 3 decimal places** *Part-whole model* *Bar model* *Place value counters* *Column addition*	**Add with more than 4-digits** *Part-whole model* *Bar model* *Place value counters* *Column addition*

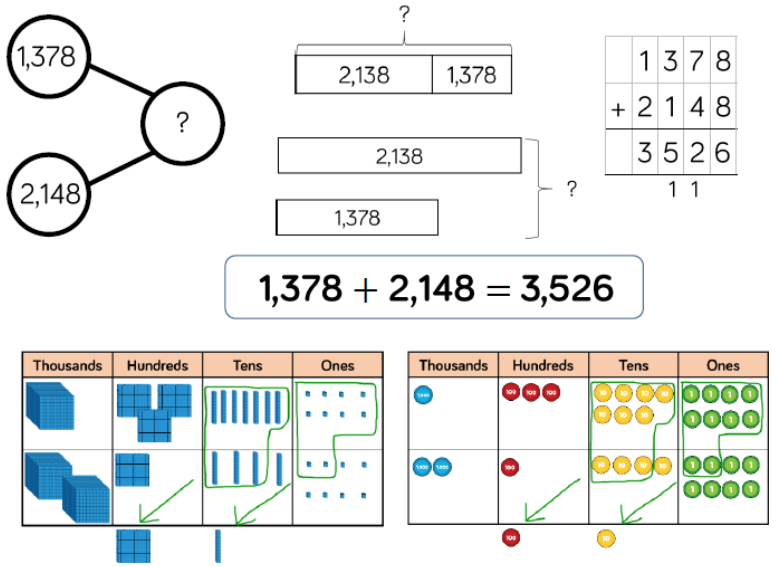
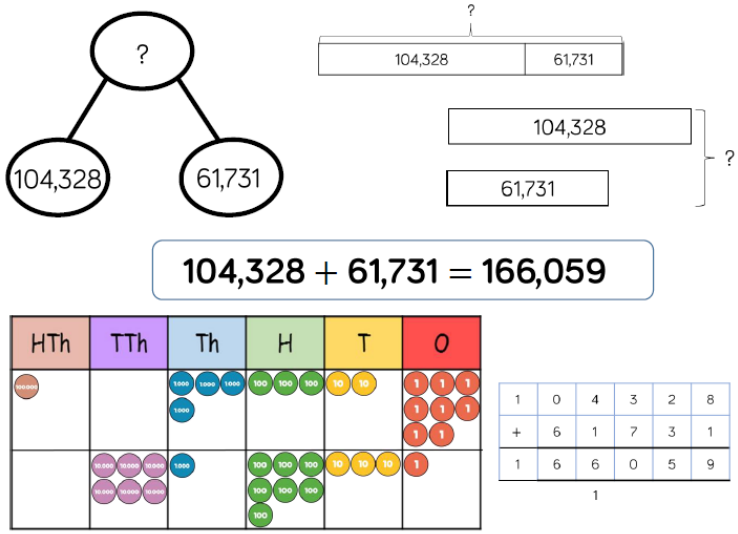
Subtraction	**Find one less from a group of objects rather than a number.** **Number bonds.** **Counting back.**	**Subtract two 1-digit numbers to 10** *Part-whole model* *Bar model* *Number shapes* *Tens frames (within 10)* *Bead strings (10)* *Number tracks* **Subtract 1 and 2-digit numbers to 20** *Part-whole model* *Bar model* *Number shapes* *Tens frames (within 20)* *Bead strings (20)* *Number tracks* *Number lines (labelled)* *Straws*	**Subtract 1 and 2-digit numbers to 100** *Part-whole model* *Bar model* *Number lines (labelled)* *Number lines (blank)* *Straws* *Hundred square* **Subtract two 2-digit numbers** *Part-whole model* *Bar model* *Number lines (blank)* *Straws* *Base 10* *Place value counters* *Column subtraction*	**Subtract with up to 3-digits** *Part-whole model* *Bar model* *Base 10* *Place value counters* *Column addition*	**Subtract with up to 4-digits** *Part-whole model* *Bar model* *Base 10* *Place value counters* *Column addition*	**Subtract with more than 4 digits** *Part-whole model* *Bar model* *Place value counters* *Column addition* **Subtract with up to 3 decimal places** *Part-whole model* *Bar model* *Place value counters* *Column addition*	**Subtract with more than 4 digits** *Part-whole model* *Bar model* *Place value counters* *Column addition* **Subtract with up to 3 decimal places** *Part-whole model* *Bar model* *Place value counters* *Column addition*
Times Tables			**Recall and use multiplication and division facts for the 2-times table, 5-times table and 10 times table** *Bar model* *Number shapes* *Counters* *Money* *Ten frames* *Bead strings* *Number lines* *Everyday objects* *Base 10*	**Recall and use multiplication and division facts for the 3-times table, 4-times table and 8 times table** *Hundred square* *Number shapes* *Counters* *Bead strings* *Number lines* *Everyday objects*	**Recall and use multiplication and division facts for the 6-times table, 7-times table and 9 times table, 11-times table, 12-times table** *Hundred square* *Base 10* *Bead strings* *Number lines* *Base 10* *Place value counters*		

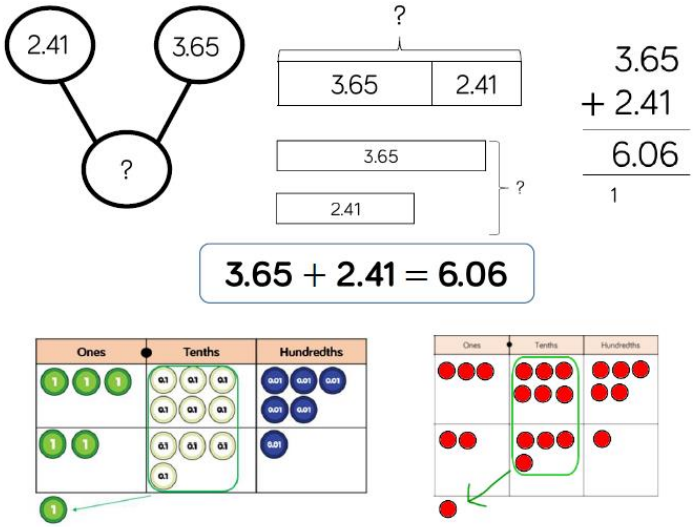
Multiplication	**Doubling**	**Solve one-step problems with multiplication** *Bar model* *Number shapes* *Counters* *Ten frames* *Bead strings* *Number lines*	**Solve one-step problems with multiplication** *Bar model* *Number shapes* *Counters* *Ten frames* *Bead strings* *Number lines*	**Multiply 2-digit by 1-digit numbers** *Place value counters* *Base 10* *Short written method* *Expanded written method*	**Multiply 2-digit by 1-digit numbers** *Place value counters* *Base 10* *Short written method* *Expanded written method* **Multiply 3-digit by 1-digit numbers** *Place value counters* *Base 10* *Short written method*	**Multiply 4-digit by 1-digit numbers** *Place value counters* *Short written method* **Multiply 2-digit by 2-digit numbers** *Place value counters* *Base 10* *Short written method* *Grid method* **Multiply 2-digit by 3-digit numbers** *Place value counters* *Short written method* *Grid method* **Multiply 2-digit by 4-digit numbers** *Formal written method*	**Multiply 2-digit by 4-digit numbers** *Formal written method*
Division	**Sharing objects into groups**	**Solve one-step problems with division (sharing)** *Bar model* *Real life objects* *Arrays* *Counters* **Solve one-step problems with division (grouping)** *Real life objects* *Number shapes* *Bead strings* *Tens frames* *Number lines* *Arrays* *Counters*	**Solve one-step problems with division (sharing)** *Bar model* *Real life objects* *Arrays* *Counters* **Solve one-step problems with division (grouping)** *Real life objects* *Number shapes* *Bead strings* *Tens frames* *Number lines* *Arrays* *Counters* **Divide 2-digits by 1-digit (no exchange sharing)** *Straws* *Base 10* *Bar model* *Place value counters* *Part-whole model*	**Divide 2-digits by 1-digit (no exchange sharing)** *Straws* *Base 10* *Bar model* *Place value counters* *Part-whole model* **Divide 2-digits by 1-digit (sharing with exchange)** *Straws* *Base 10* *Bar model* *Place value counters* *Part-whole model* **Divide 2-digits by 1-digit (sharing with remainders)** *Straws* *Base 10* *Bar model* *Place value counters* *Part-whole model*	**Divide 2-digits by 1-digit (sharing with remainders)** *Straws* *Base 10* *Bar model* *Place value counters* *Part-whole model* **Divide 2-digits by 1-digit (grouping)** **Divide 3-digits by 1-digit (grouping)** *Place value counters* *Counters* *Place value grid* *Written short division* **Divide 3-digits by 1-digit (sharing with exchange)** *Base 10* *Bar model* *Place value counters* *Part-whole model*	**Divide 2-digits by 1-digit (grouping)** *Place value counters* *Counters* *Place value grid* *Written short division* **Divide 3-digits by 1-digit (grouping)** *Place value counters* *Counters* *Place value grid* *Written short division* **Divide 4-digits by 1-digit (grouping)** *Place value counters* *Counters* *Place value grid* *Written short division*	**Divide multi-digits by 2-digits (short division)** *Written short division* *List of multiples* **Divide multi-digits by 2-digits (long division)** *Written long division* *List of multiples*

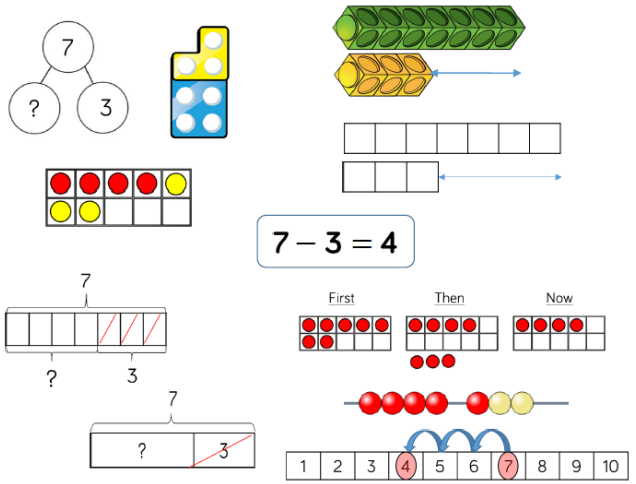
Year group	Skill	Guidance	Representations and models
1	Add 1-digit numbers within 10	When adding numbers to 10, children can explore both aggregation and augmentation. The part-whole model, discrete and continuous bar model, number shapes and ten frame support aggregation. The combination bar model, ten frame, bead string and number track all support augmentation.	
1/2	Add 1 and 2-digit numbers to 20	When adding one-digit numbers that cross 10, it is important to highlight the importance on ten ones equalling one ten. Different manipulatives can be used to represent this exchange. Use concrete resources alongside number lines to support children in understanding how to partition their jumps.	

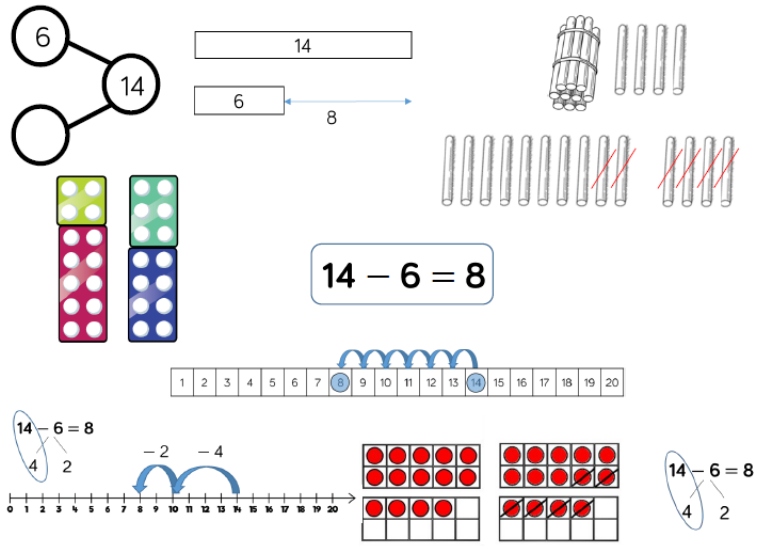
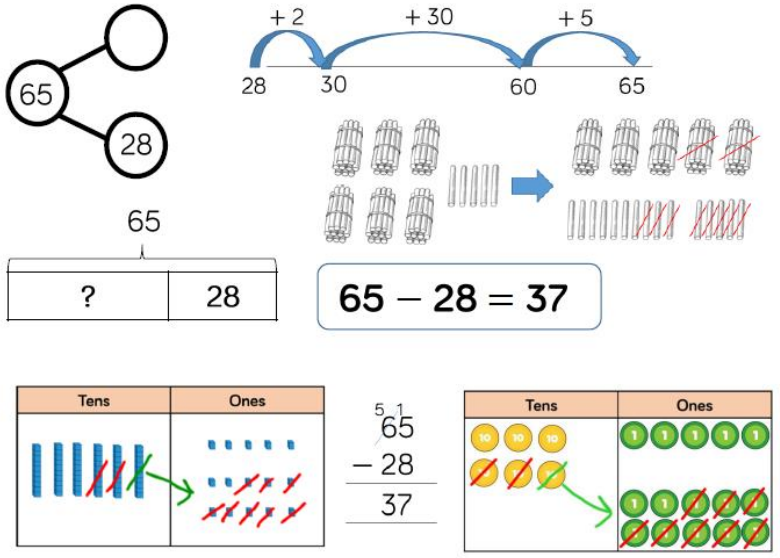
2	Add three 1-digit numbers	When adding three 1-digit numbers, children should be encouraged to look for numbers bonds to 10 or doubles to add the numbers more efficiently. This supports children in their understanding of commutativity. Manipulatives that highlight number bonds to 10 are effective when adding three 1-digit numbers.	
2/3	Add 1-digit and 2-digit numbers to 100	When adding single digits to a two-digit number, children should be encouraged to count on from the larger number. They should also apply their knowledge of number bonds to add more efficiently e.g. 8 + 5 = 13 so 38 + 5 = 43. Hundred squares and straws can support children to find number bonds to 10.	

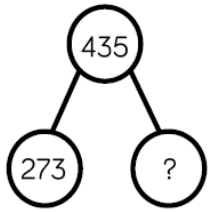
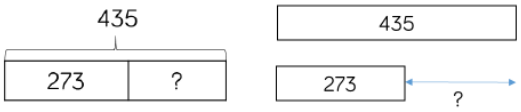
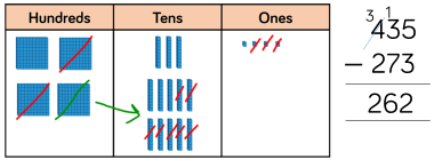
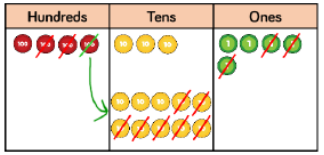
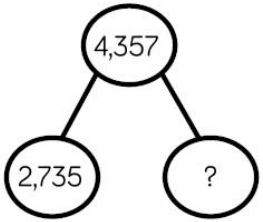
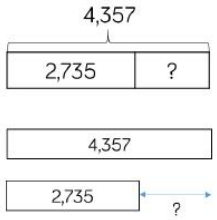
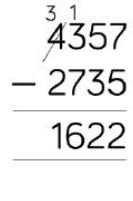
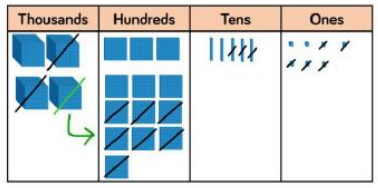
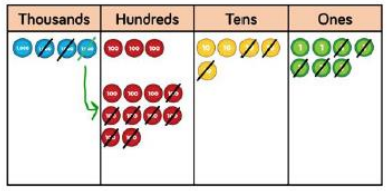
2/3	Add two 2-digit numbers to 100	At this stage, encourage children to use the formal column method when calculating alongside straws, base 10 or place value counters. As numbers become larger, straws become less efficient. Children can also use a blank number line to count on to find the total. Encourage them to jump to multiples of 10 to become more efficient.	
3	Add numbers with up to 3-digits	Base 10 and place value counters are the most effective manipulatives when adding numbers with up to 3 digits. Ensure children write out their calculation alongside any concrete resources so they can see the links to the written column method. Plain counters on a place value grid can also be used to support learning.	

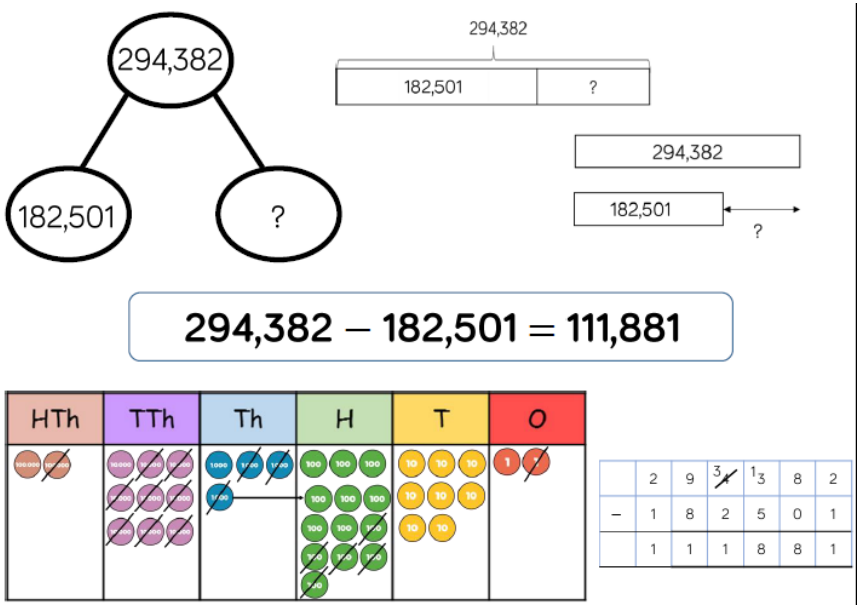
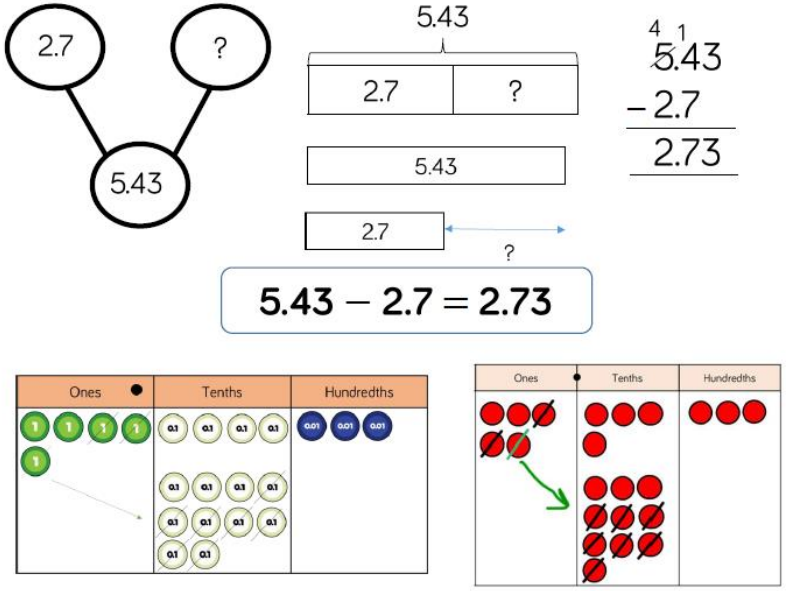
4	Add numbers with up to 4-digits	Base 10 and place value counters are the most effective manipulatives when adding numbers with up to 3 digits. Ensure children write out their calculation alongside any concrete resources so they can see the links to the written column method. Plain counters on a place value grid can also be used to support learning.	
5/6	Add numbers with more than 4 digits	Place value counters or plain counters on a place value grid are the most effective concrete resources when adding numbers with more than 4 digits. At this stage, children should be encouraged to work in the abstract, using the column method to add larger numbers efficiently.	

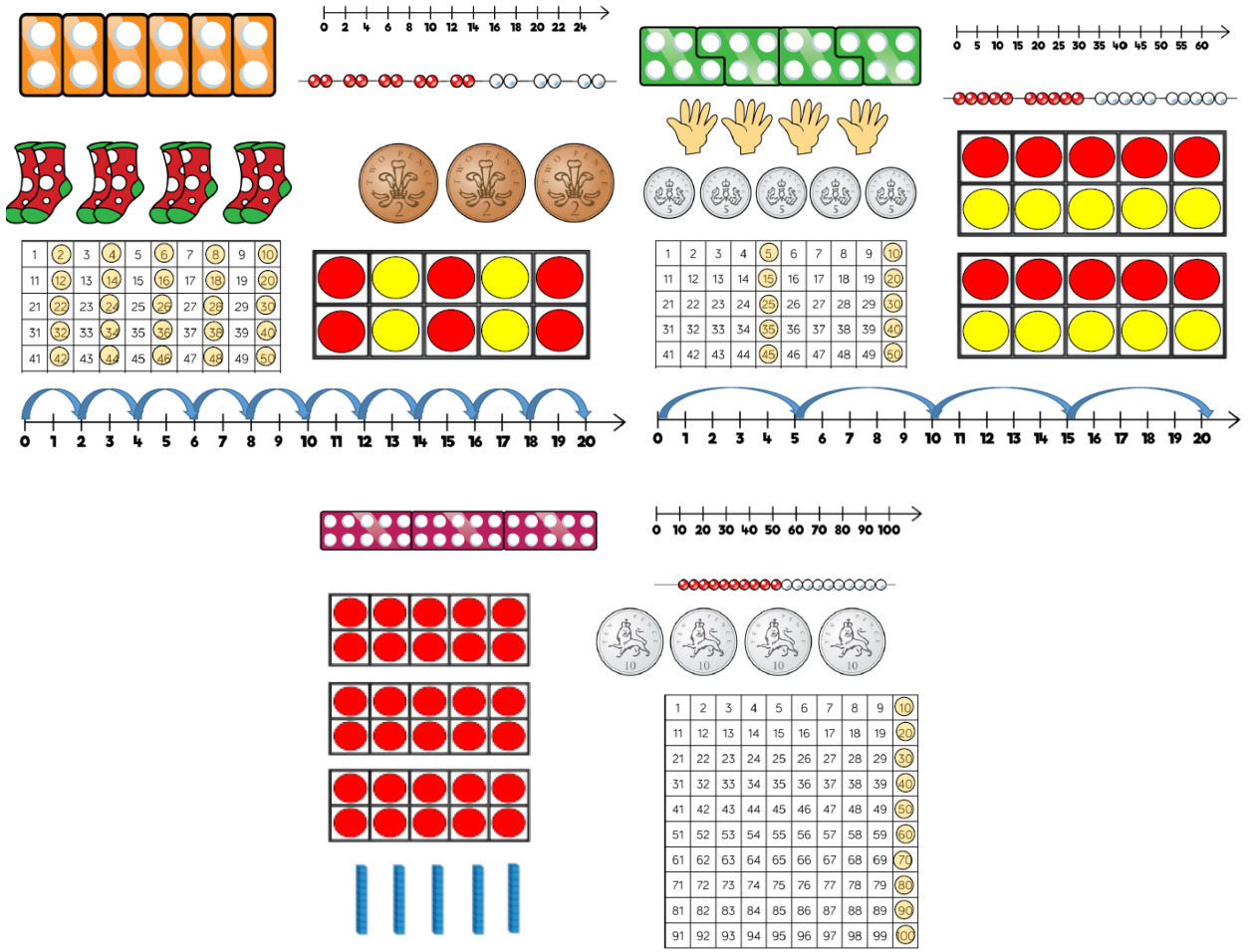
5	Add with up to 3 decimal places	Place value counters and plain counters on a place value grid are the most effective manipulatives when adding decimals with 1,2 and then 3 decimal places. Ensure children have experience of adding decimals with a variety of decimal places. This includes putting this into context when adding money and other measures.	

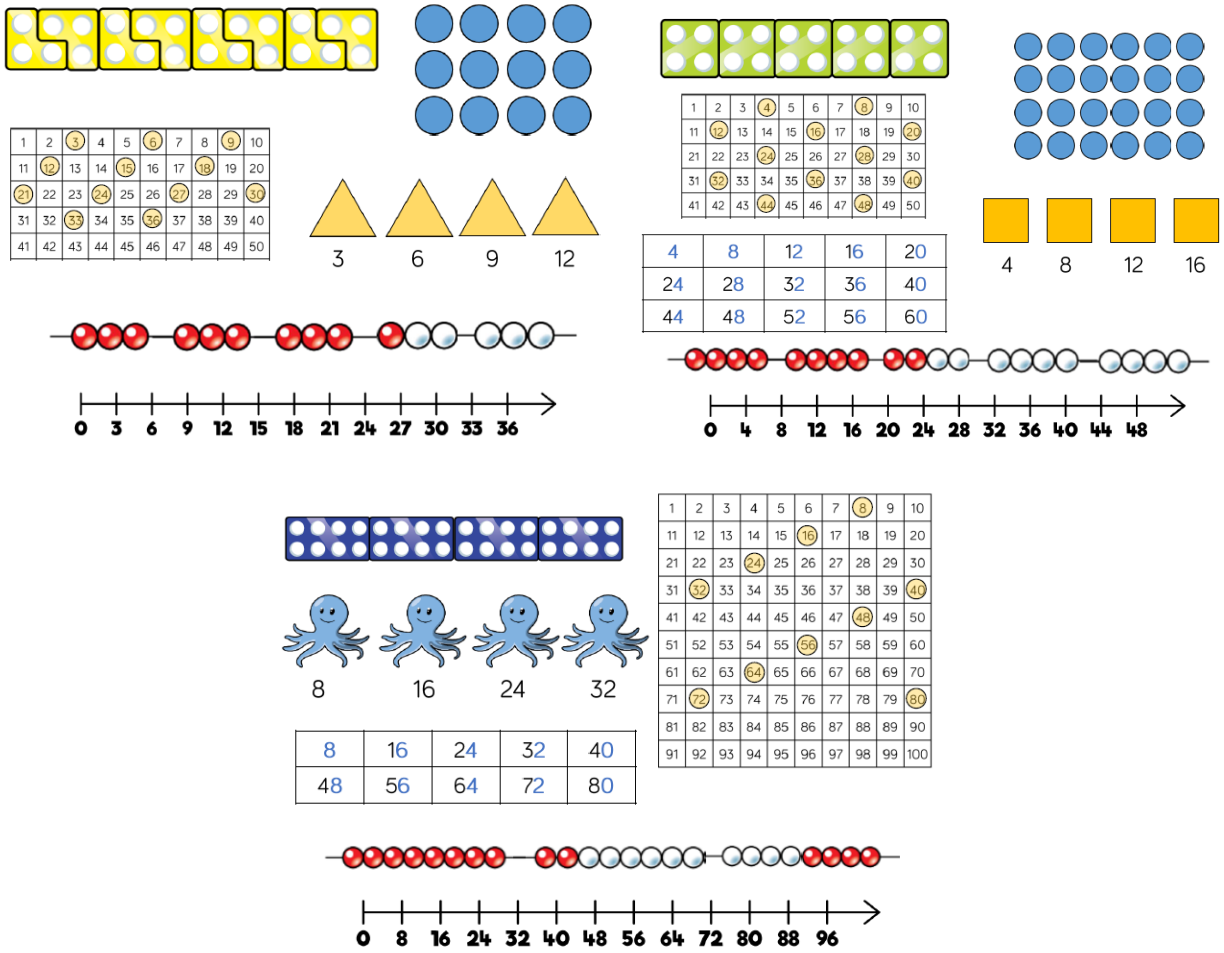
Year group	Skill	Guidance	Representations and models
1	Subtract 1-digit numbers within 10	Part-whole models, bar models, ten frames and number shapes support partitioning. Ten frames, number tracks, single bar models and bead strings support reduction. Cubes and bar models with two bars can support finding the difference.	

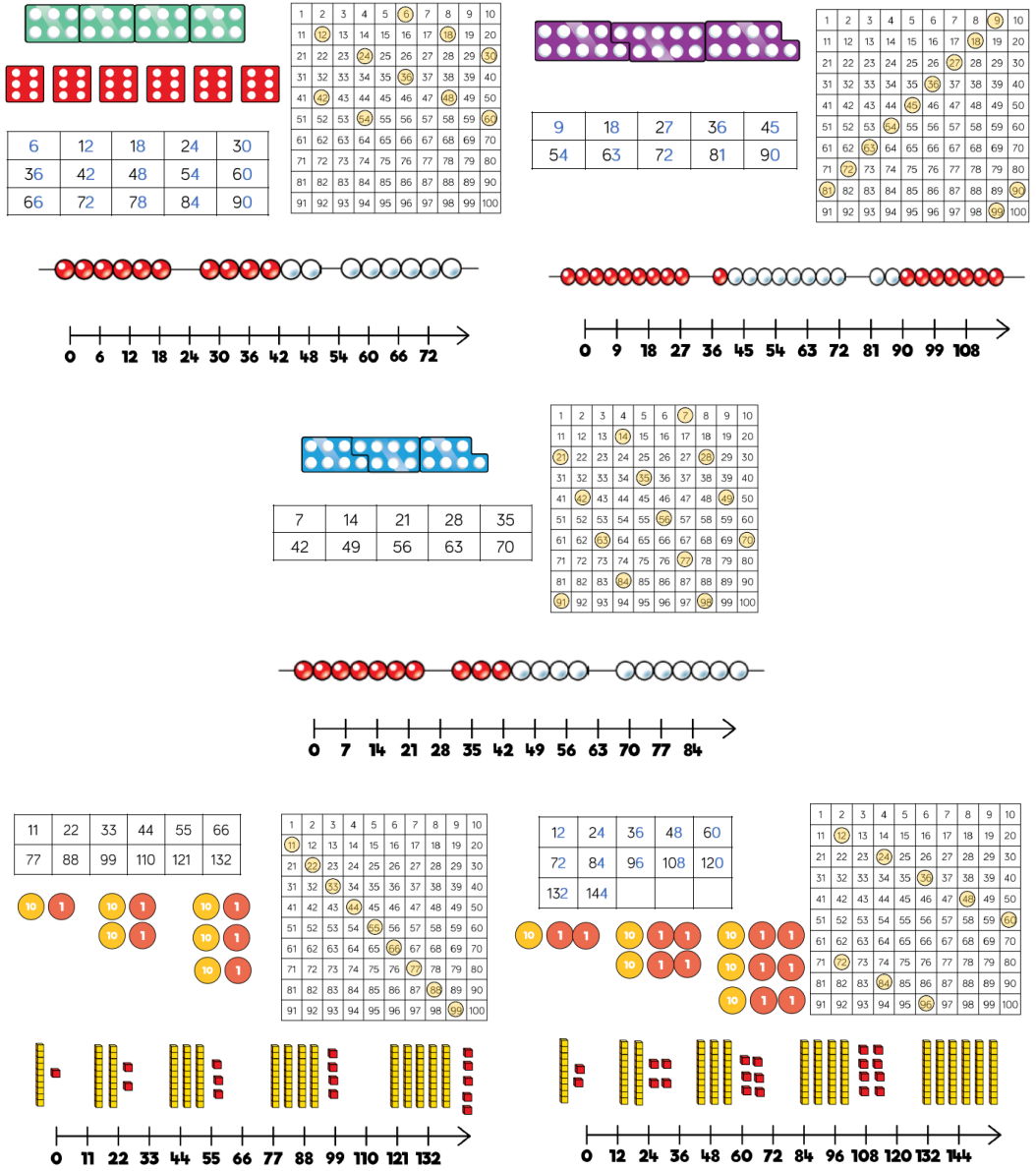
1/2	Subtract 1 and 2-digit numbers to 20	When subtracting one-digit numbers that cross 10, it is important to highlight the importance of ten ones equalling one ten. Children should be encouraged to find the number bond to 10 when partitioning the subtracted number. Ten frames, number shapes and number lines are particularly useful for this.	
2	Subtract 1 and 2-digit numbers to 100	At this stage, encourage children to use the formal column method when calculating alongside straws, base 10 or place value counters. As numbers become larger, straws become less efficient. Children can also use a blank number line to count on to find the difference. Encourage them to jump to multiples of 10 to become more efficient.	

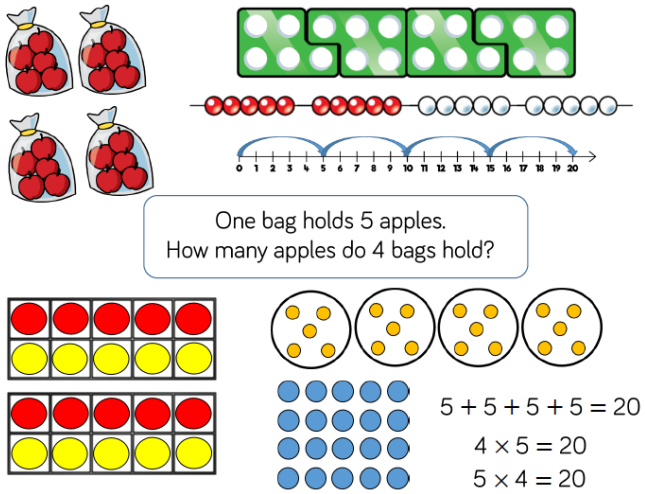
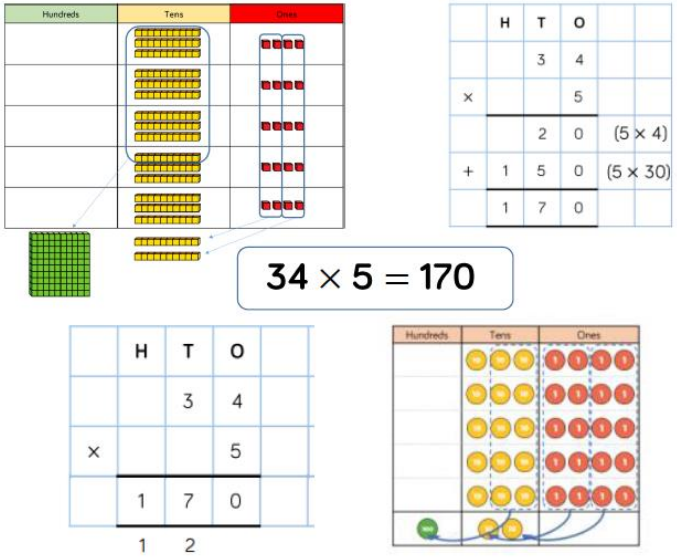
3	Subtract numbers with up to 3 digits	Base 10 and place value counters are the most effective manipulative when subtracting numbers with up to 3 digits. Ensure children write out their calculation alongside any concrete resources so they can see the links to the written column method. Plain counters on a place value grid can also be used to support learning.	  435 − 273 = 262  
4	Subtract numbers with up to 4 digits	Base 10 and place value counters are the most effective manipulatives when subtracting numbers with up to 4 digits. Ensure children write out their calculation alongside any concrete resources so they can see the links to the written column method. Plain counters on a place value grid can also be used to support learning.	   4,357 − 2,735 = 1,622  

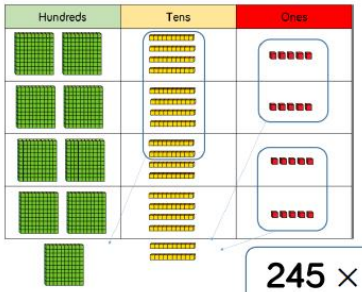
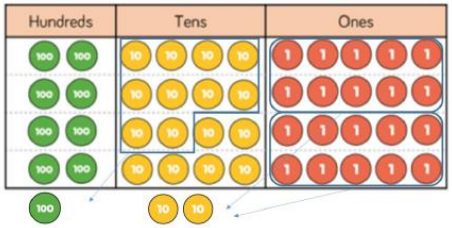
5/6	Subtract numbers with more than 4 digits	Place value counters or plain counters on a place value grid are the most effective concrete resources when subtracting numbers with more than 4 digits. At this stage, children should be encouraged to work in the abstract, using column method to subtract larger numbers efficiently.	
5	Subtract with up to 3 decimal places	Place value counters or plain counters on a place value grid are the most effective manipulative when subtracting decimals with 1, 2 and then 3 decimal places. Ensure children have experience of subtracting decimals with a variety of decimal places. This includes putting this into context when subtracting money and other measures.	

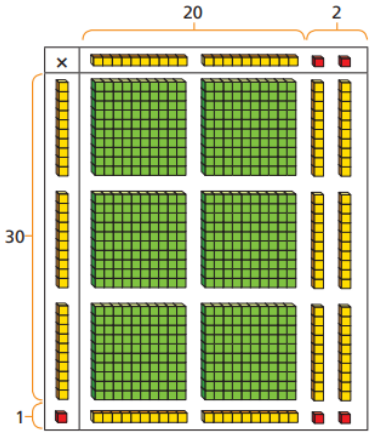
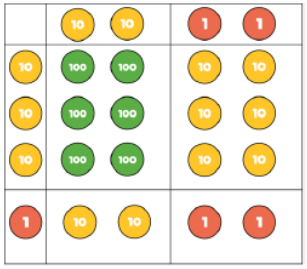
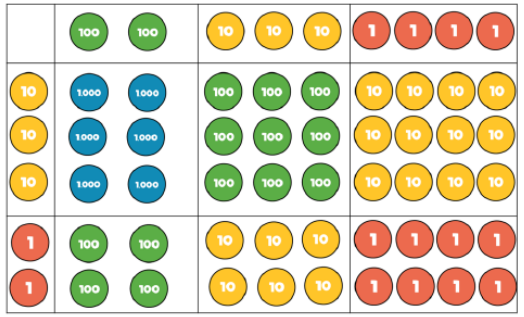
Year group	Skill	Guidance	Representations and models
2	**Recall and use multiplication and division facts for the 2-times table, 5-times table and 10 times table**	Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or a hundred square. Look for patterns in the 2 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. Look for patterns in the 5 times table, using concrete manipulatives to support. Notice the pattern in the ones as well as highlighting the odd, even, odd, even pattern. Look for patterns in the 10 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.	

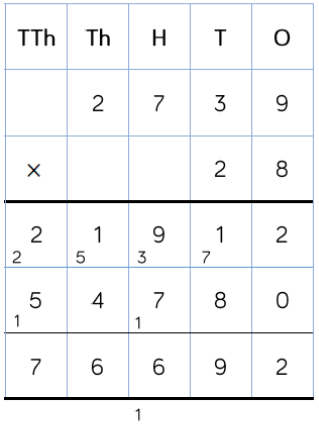
3	**Recall and use multiplication and division facts for the 3-times table, 4-times table and 8 times table**	Encourage daily counting in multiples both forwards and backwards (for the 3s). This can be supported using a number line or a hundred square. Look for patterns in the 3 times table, using concrete manipulatives to support. Notice odd, even, odd, even pattern using number shapes to support. Highlight the pattern in the ones using a hundred square. Encourage daily counting on multiples both forwards and backwards. This can be supported using a number line or a hundred square. Look for patterns in the 4 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 all multiples are even using number shapes to support. Look for patterns in the 8 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 multiples are even using number shapes to support.	

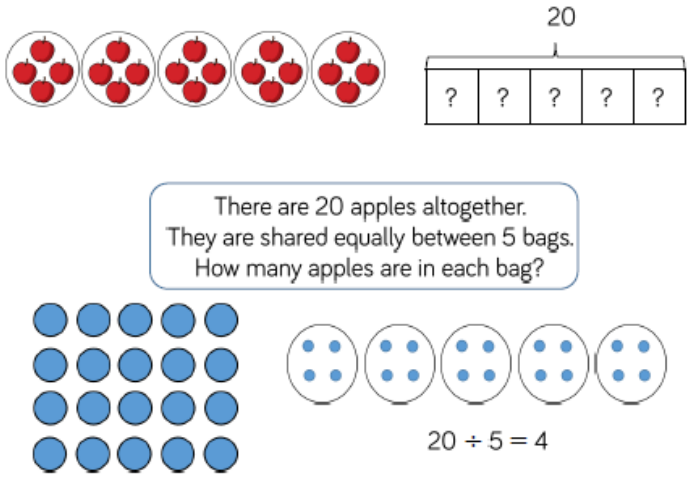
4	**Recall and use multiplication and division facts for the 6-times table, 7-times table and 9 times table, 11-times table, 12-times table**	Encourage daily counting on multiples forwards (and backwards for the 9s, 7s, 11s). This can be supported using a number line or a hundred square. Look for patterns in the 6 times table, using concrete manipulatives to support. Make links to the 3 times table, seeing how each multiple is double the threes. Notice the pattern in the ones within each group of five multiples. Highlight that all multiples are even using number shapes to support. Look for patterns in the 9 times table, using concrete manipulatives to support. Notice the pattern in the tens and ones using a hundred square to support as well as noting the odd, even pattern within the multiples. The 7 times table can be trickier to learn due 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. Look for patterns in the 11 times table, using concrete manipulatives to support. Notice the pattern in the tens and ones using a hundred square to support. Also consider the pattern after crossing 100. Look for patterns in the 12 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.	

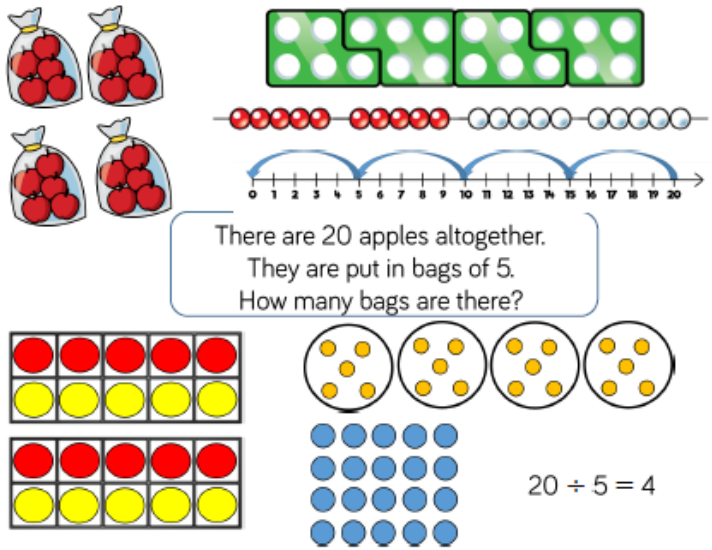
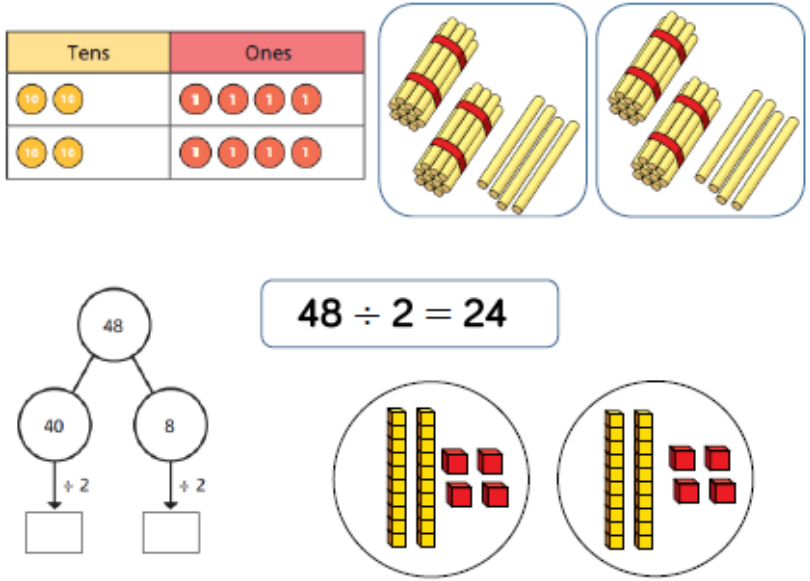
Year group	Skill	Guidance	Representations and models
1/2	Solve one-step problems with multiplication	Children represent multiplication as repeated addition in many different ways. In Year 1, children use concrete and pictorial representations to solve problems. They are not expected to record multiplication formally. In Year 2, children are introduced to the multiplication symbol.	
3/4	Multiply 2-digit numbers by 1-digit numbers	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 the multiplication, as children should use times table knowledge.	

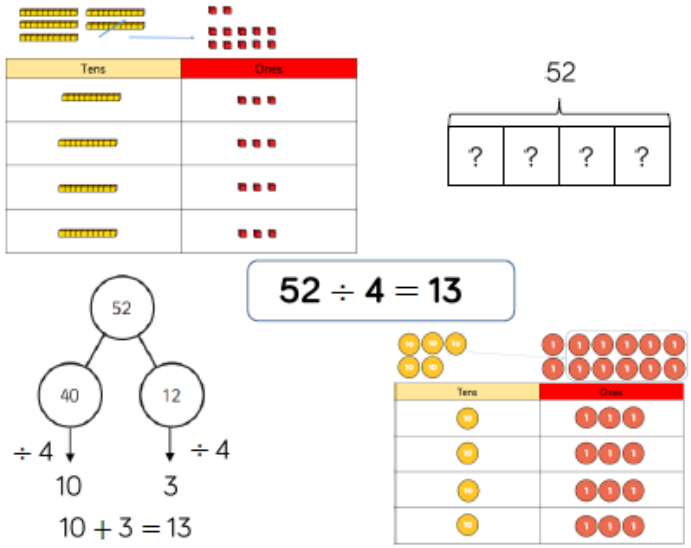
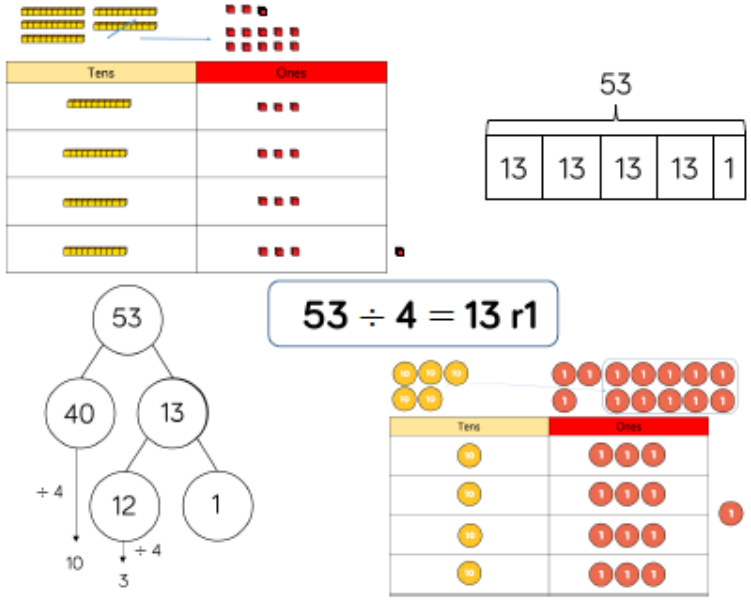
3/4	Multiply 3-digit numbers by 1-digit numbers	When moving to 3-digit by 1-digit multiplication, encourage children to move towards the short, formal written method. Base 10 and place value counters continue to support the understanding of the written method. Limit the number of exchanges needed in the questions and move children away from resources when multiplying larger numbers.	 H T O 2 4 5 × 4 9 8 0 1 2 $245 \times 4 = 980$ 
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.	 $1{,}826 \times 3 = 5{,}478$ Th H T O 1 8 2 6 × 3 5 4 7 8 2 1

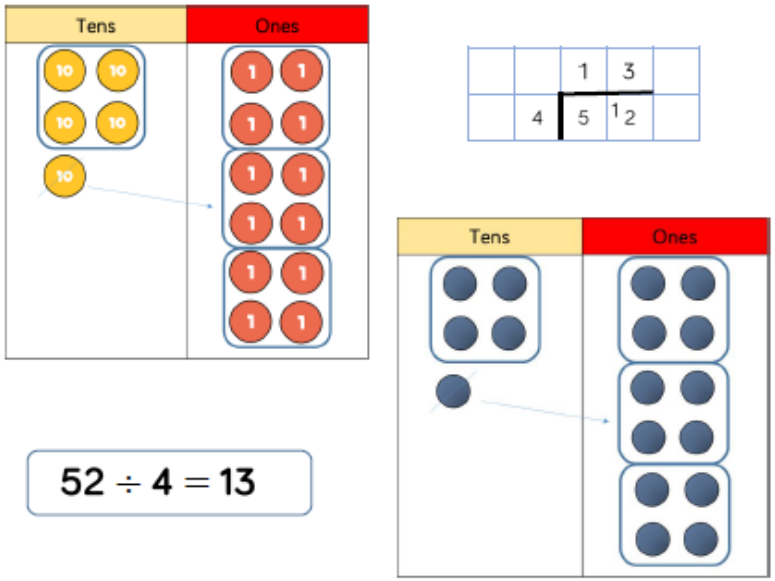
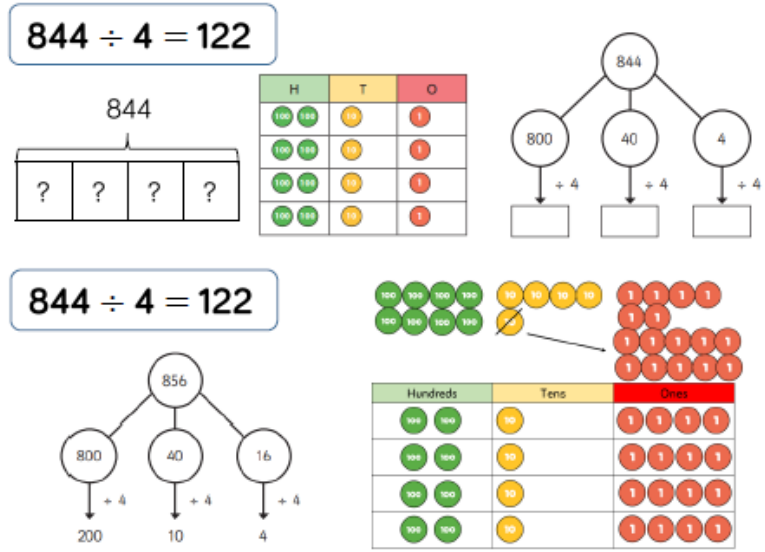
5	Multiply 2-digit numbers by 2-digit numbers	When multiplying a multi-digit number by 2-digits, use the area model to help children understand the size of the numbers they are using. This links to finding the area o a rectangle by finding the space covered by the Base 10. The grid method matches the area model as an initial written method before moving on to the formal written multiplication method.	  $22 \times 31 = 682$ × | 20 | 2 30 | 600 | 60 1 | 20 | 2 H T O 2 2 × 3 1 2 2 6 6 0 6 8 2
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.	 Th H T O 2 3 4 × 3 2 4 6 8 1^{7} 1^{0} 2 0 7 4 8 8 $234 \times 32 = 7{,}488$ × | 200 | 30 | 4 30 | 6,000 | 900 | 120 2 | 400 | 60 | 8

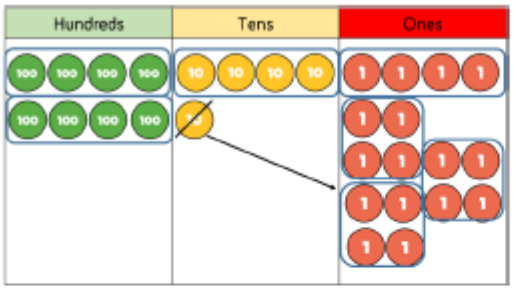
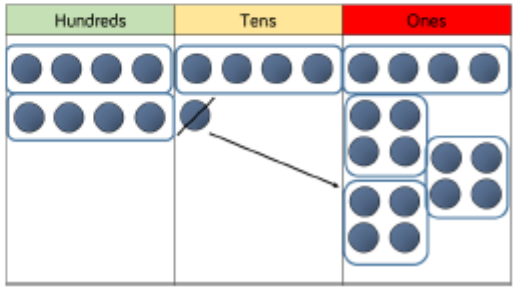
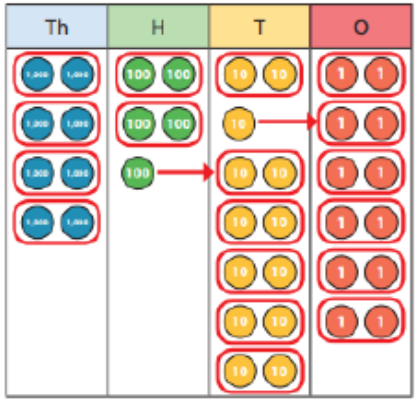
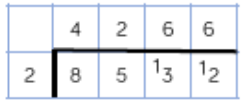
5/6	Multiply 4-digit numbers by 2-digit numbers	When multiplying 4-digits by 2-digits, children should be confident in the written method. If they are still struggling with times tables, provide multiplication grids to support when they are focusing on the use of the method. Consider where exchanged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

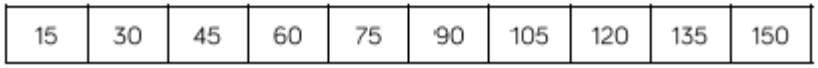
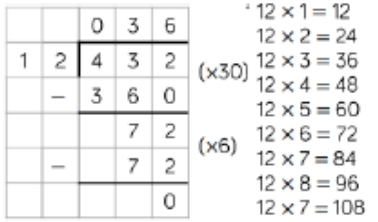
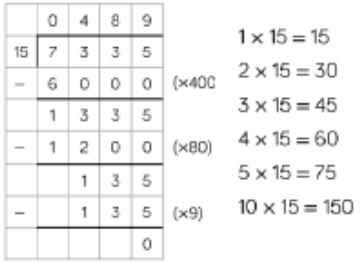
Year group	Skill	Guidance	Representations and models
1/2	Solve 1-step problems using multiplication (sharing)	Children solve problems by sharing amounts into equal groups. In Year 1, children use concrete and pictorial representations to solve problems. They are not expected to record division formally. In Year 2, children are introduced to the division symbol.	

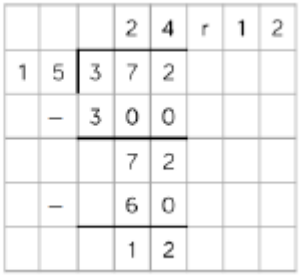
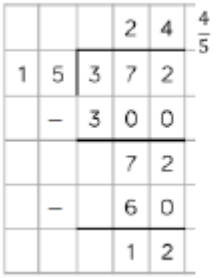
1/2	Solve 1-step problems using division (grouping)	Children solve problems by grouping and counting the number of groups. Grouping encourages children to count in multiples and links to repeated subtraction on a number line. They can use concrete representations in fixed groups such as number shapes which helps to show the link between multiplication and division.	
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.	

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 the tens and ones equally between the rows. Flexible partitioning in a part-whole model supports this model.	
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.	

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.	
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.	

5	Divide 3-digits by 1-digit (grouping)	Children can continue to use grouping to support their understanding of short division when dividing a 3-digit number by a 1-digit 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.	   856 ÷ 4 = 214
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 encouraged to move away from the concrete and pictorial when dividing numbers with multiple exchanges.	  8,532 ÷ 2 = 4,266

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 large remainders. Children will also solve problems with remainders where the quotient can be rounded as appropriate.	 $432 \div 12 = 36$ $7{,}335 \div 15 = 489$  
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 to support their calculations with larger remainders. Children will also solve problems with remainders where the quotient can be rounded as appropriate.	 $12 \times 1 = 12$ $12 \times 2 = 24$ $12 \times 3 = 36$ $12 \times 4 = 48$ $12 \times 5 = 60$ $12 \times 6 = 72$ $12 \times 7 = 84$ $12 \times 8 = 96$ $12 \times 7 = 108$ $12 \times 10 = 120$ $432 \div 12 = 36$ $7{,}335 \div 15 = 489$  $1 \times 15 = 15$ $2 \times 15 = 30$ $3 \times 15 = 45$ $4 \times 15 = 60$ $5 \times 15 = 75$ $10 \times 15 = 150$

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.	$372 \div 15 = 24\ r12$  1 × 15 = 15 2 × 15 = 30 3 × 15 = 45 4 × 15 = 60 5 × 15 = 75 10 × 15 = 150  $372 \div 15 = 24\frac{4}{5}$