Hollickwood School Calculation Policy – Key Stage 1

This document aims to demonstrate the methods used to teach different forms of calculation across the CHBP federation. It is structured by year group in order to clearly show progression for each operation and to aid a smooth transition from one year group to the next. The policy provides calculation guidance and expectations for each step taught, clearly emphasising the importance of using concrete resources initially to develop mathematical understanding. This use of manipulatives helps reinforce understanding and provides support when calculating mentally, mentally with jottings, using expanded methods and formal written methods.

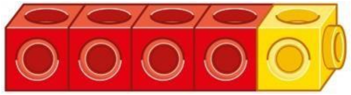
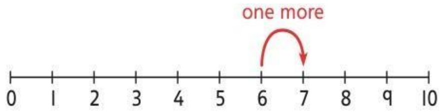
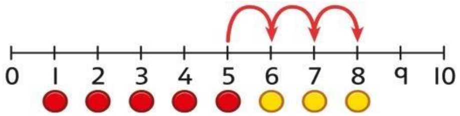
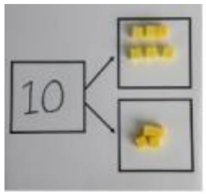
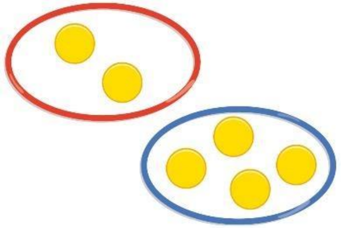
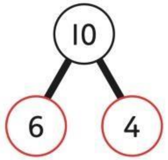
Children should progress between the stages working towards formal written methods (where appropriate), once they have mastered each stage. However, they should not be hurried and, after the method has been taught, children should still be able to make their preferred choice of the most appropriate, efficient and accurate method for them. Previous stages may need to be revisited to consolidate understanding when introducing a new strategy. As new methods of calculations are introduced, children should have the opportunity to examine them, alongside the method they have consolidated, to make connections between the methods and establish the similarities and differences between them.

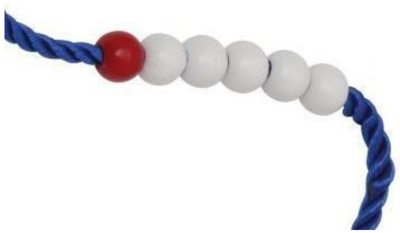
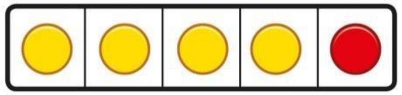
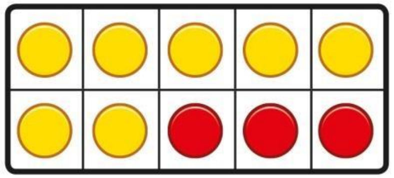
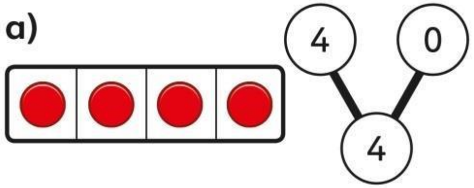
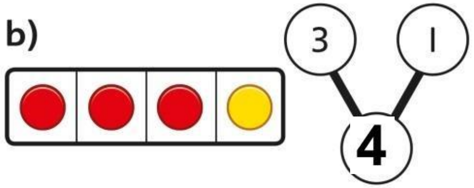
Key Stage 1

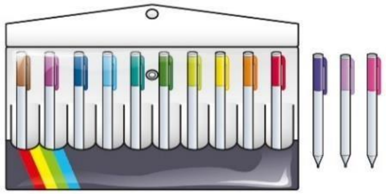
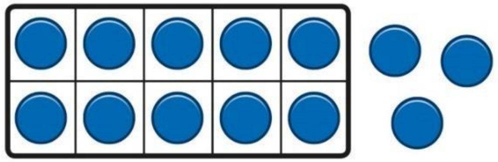
Children develop the core ideas that underpin all calculation. They begin by connecting calculation with counting on and counting back, but they should learn that understanding wholes and parts will enable them to calculate efficiently and accurately, and with greater flexibility. They learn how to use an understanding of 10s and 1s to develop their calculation strategies, especially in addition and subtraction.
Key language: **whole, part, ones, ten, tens, number bond, add, addition, plus, total, altogether, subtract, subtraction, find the difference, take away, minus, less, more, group, share, equal, equals, is equal to, groups, equal groups, times, multiply, multiplied by, divide, share, shared equally, times-table**

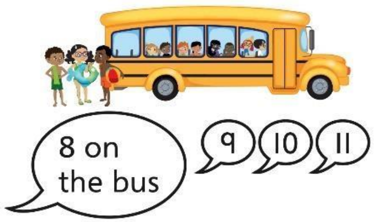
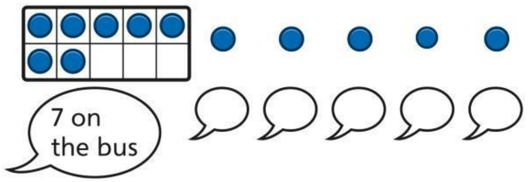
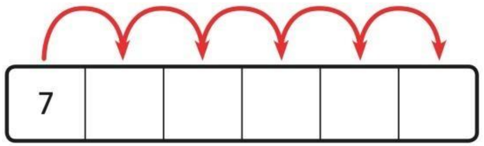
Addition and subtraction: Children first learn to connect addition and subtraction with counting, but they soon develop two very important skills: an understanding of parts and wholes, and an understanding of unitising 10s, to develop efficient and effective calculation strategies based on known number bonds and an increasing awareness of place value. Addition and subtraction are taught in a way that is interlinked to highlight the link between the two operations. A key idea is that children will select methods and approaches based on their number sense. For example, in Year 1, when faced with 15 − 3 and 15 − 13, they will adapt their ways of approaching the calculation appropriately. The teaching should always emphasise the importance of mathematical thinking to ensure accuracy and flexibility of approach, and the importance of using known number facts to harness their recall of bonds within 20 to support both addition and subtraction methods. In Year 2, they will start to see calculations presented in a column format, although this is not expected to be formalised until KS2.	**Multiplication and division:** Children develop an awareness of equal groups and link this with counting in equal steps, starting with 2s, 5s and 10s. In Year 2, they learn to connect the language of equal groups with the mathematical symbols for multiplication and division. They learn how multiplication and division can be related to repeated addition and repeated subtraction to find the answer to the calculation. In this key stage, it is vital that children explore and experience a variety of strong images and manipulative representations of equal groups, including concrete experiences as well as abstract calculations. Children begin to recall some key multiplication facts, including doubles, and an understanding of the 2, 5 and 10 timestables and how they are related to counting.	**Fractions:** In Year 1, children encounter halves and quarters, and link this with their understanding of sharing. They experience key spatial representations of these fractions, and learn to recognise examples and nonexamples, based on their awareness of equal parts of a whole. In Year 2, they develop an awareness of unit fractions and experience non-unit fractions, and they learn to write them and read them in the common format of numerator and denominator.

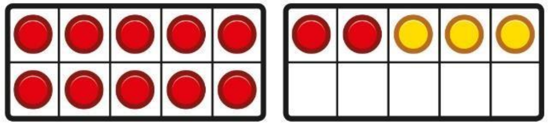
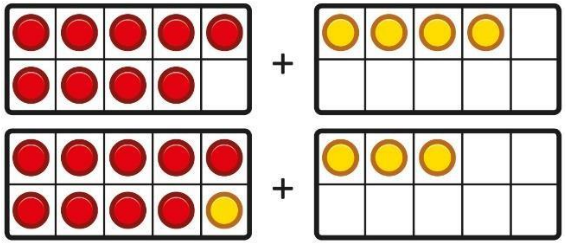
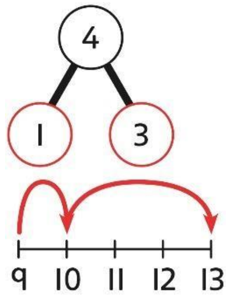
Year 1			
	Concrete	**Pictorial**	**Abstract**

Year 1 Addition			
Counting and adding more	Children add one object to a group to find one more.  One more than 5 is 6	Children add one more cube or counter to a group to represent one more.  One more than 4 is 5.	Use a number line to understand how to link counting on with finding one more.  One more than 6 is 7. 7 is one more than 6. Learn to link counting on with adding more than one.  5 + 3 = 8
Understanding part-partwhole relationship	Sort objects into parts and understand the relationship with the whole.    The parts are 6 and 4. The whole is 10.	Children draw to represent the parts and understand the relationship with the whole.  The parts are 2 and 4. The whole is 6.	Use a part-whole model to represent the numbers.  $\boxed{6} + \boxed{4} = \boxed{10}$ 6 + 4 = 10

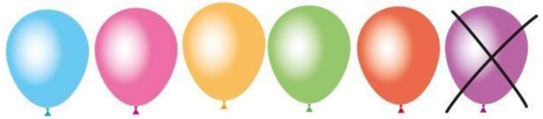
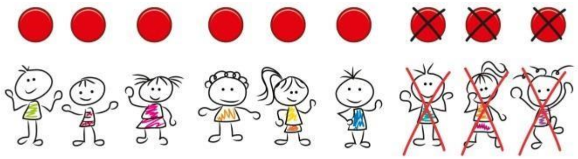
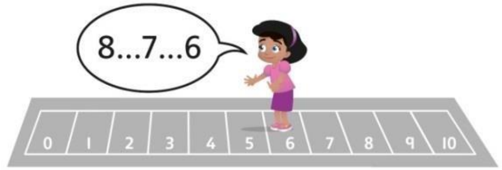
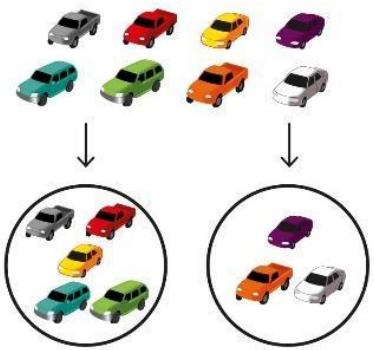
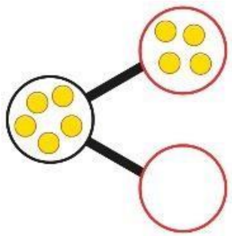
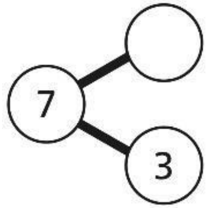
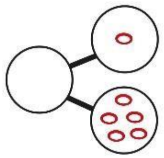
Knowing and finding number bonds within 10	Break apart a group and put back together to find and form number bonds.  3 + 4 = 7  5 +1 = 6	Use five and ten frames to represent key number bonds.  5 = 4 + 1  10 = 7 + 3	Use a part-whole model alongside other representations to find number bonds. Make sure to include examples where one of the parts is zero. **a)**  **b)**  4 + 0 = 4 3 + 1 = 4

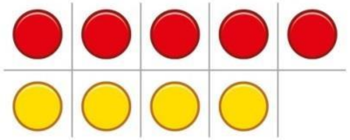
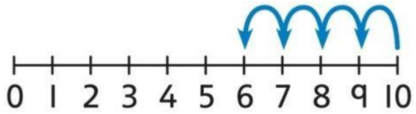
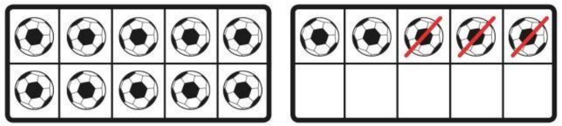
Understanding teen numbers as a complete 10 and some more	Complete a group of 10 objects and count more.  13 is 10 and 3 more.	Use a ten frame to support understanding of a complete 10 for teen numbers.  13 is 10 and 3 more.	1 ten and 3 ones equal 13. 10 + 3 = 13

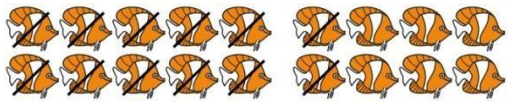
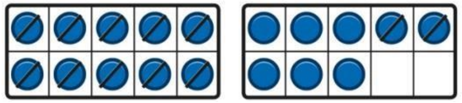
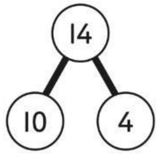
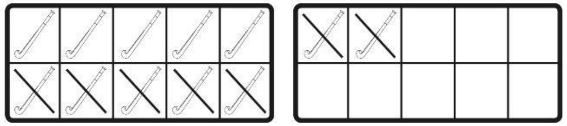
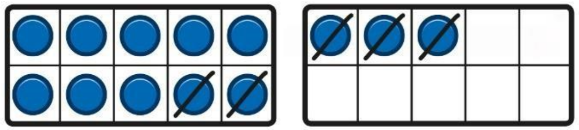
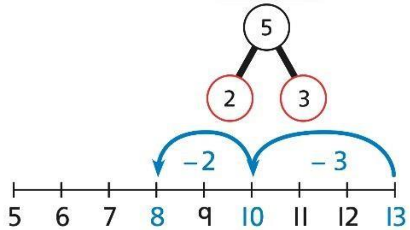
Adding by counting on	Children use knowledge of counting to 20 to find a total by counting on using people or objects.  	Children use counters to support and represent their counting on strategy.  	Children use number lines or number tracks to support their counting on strategy.  7 + 5 = ☐

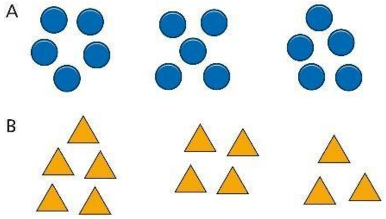
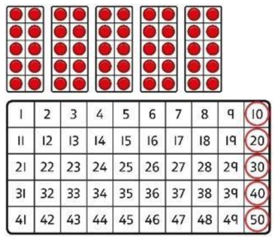
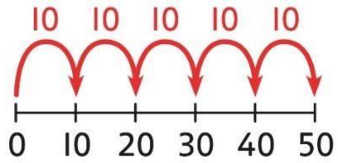
Adding the 1s	Children use bead strings to recognise how to add the 1s to find the total efficiently.  4 + 6 + 7 = 17	Children represent calculations using ten frames to add a teen and 1s.  2 + 3 = 5 12 + 3 = 15	Children recognise that a teen is made from a 10 and some 1s and use their knowledge of addition within 10 to work efficiently. 3 + 5 = 8 So, 13 + 5 = 18
Bridging the 10 using number bonds	Children use a bead string to complete a 10 and understand how this relates to the addition.  7 add 3 makes 10. So, 7 add 5 is 10 and 2 more.	Children use counters to complete a ten frame and understand how they can add using knowledge of number bonds to 10. 	Use a part-whole model and a number line to support the calculation.  9 + 4 = 13

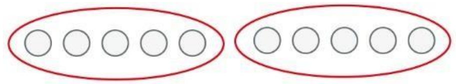
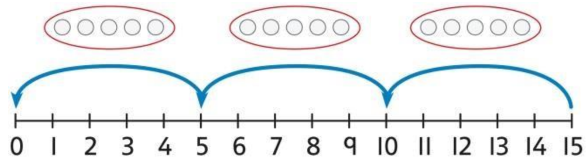
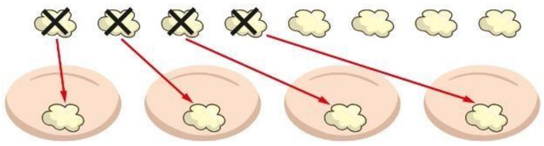
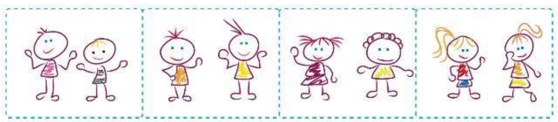
Year 1 Subtraction

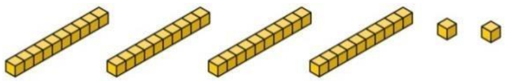
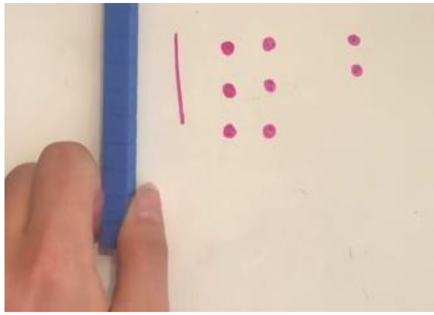
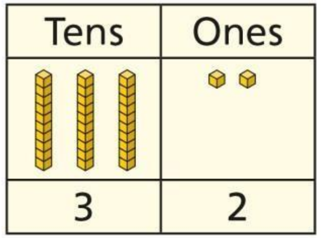
Counting back and taking away	Children arrange objects and remove to find how many are left. Use physical objects, counters, cubes etc to show how objects can be taken away.  1 less than 6 is 5. 6 subtract 1 is 5.	Children draw and cross out or use counters to represent objects from a problem.  9 − □ = □ There are □ children left.	Children count back to take away and use a number line or number track to support the method.  9 − 3 = 6
Finding a missing part, given a whole and a part	Children separate a whole into parts and understand how one part can be found by subtraction.  8 − 5 = ?	Children represent a whole and a part and understand how to find the missing part by subtraction.  5 − 4 = □	Children use a part-whole model to support the subtraction to find a missing part.  7 − 3 = ? Children develop an understanding of the relationship between addition and subtraction facts in a part-whole model.  □ − □ = □ □ − □ = □ □ + □ = □ □ + □ = □

Finding the difference	Arrange two groups of objects so that the difference between the groups can be worked out.  8 is 2 more than 6. 6 is 2 less than 8. The difference between 8 and 6 is 2.	Represent objects using sketches or counters to support finding the difference.  5 − 4 = 1 The difference between 5 and 4 is 1.	Children understand 'find the difference' as subtraction.  10 − 4 = 6 The difference between 10 and 6 is 4.
Subtraction within 20	Understand when and how to subtract 1s efficiently. Use a bead string to subtract 1s efficiently.  5 − 3 = 2 15 − 3 = 12	Understand when and how to subtract 1s efficiently.  5 − 3 = 2 15 − 3 = 12	Understand how to use knowledge of bonds within 10 to subtract efficiently. 5 − 3 = 2 15 − 3 = 12

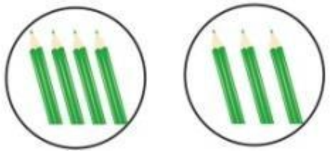
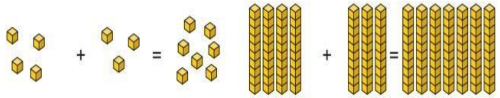
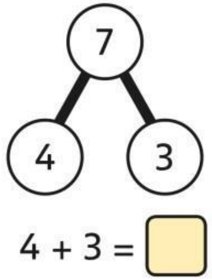
Subtracting 10s and 1s	For example: 18 − 12 Subtract 12 by first subtracting the 10, then the remaining 2.  First subtract the 10, then take away 2.	For example: 18 − 12 Use ten frames to represent the efficient method of subtracting 12.  First subtract the 10, then subtract 2.	Use a part-whole model to support the calculation.  19 − 14 19 − 10 = 9 9 − 4 = 5 So, 19 − 14 = 5
Subtraction bridging 10 using number bonds	For example: 12 − 7 Arrange objects into a 10 and some 1s, then decide on how to split the 7 into parts.  7 is 2 and 5, so I take away the 2 and then the 5.	Represent the use of bonds using ten frames.  For 13 – 5, I take away 3 to make 10, then take away 2 to make 8.	Use a number line and a part-whole model to support the method. 13 − 5 
Year 1 **Multiplication**			

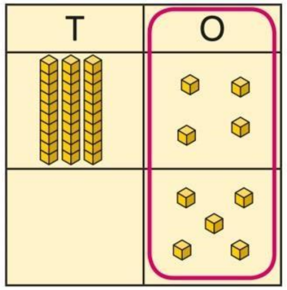
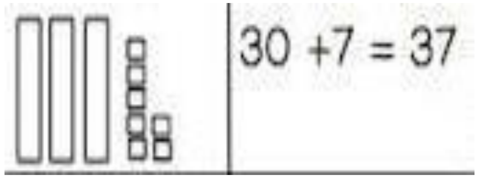
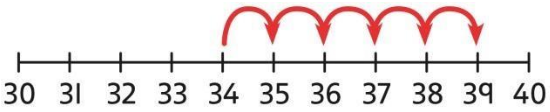
Recognising and making equal groups	Children arrange objects in equal and unequal groups and understand how to recognise whether they are equal. 	Children draw and represent equal and unequal groups. 	**Describe equal groups using words** Three equal groups of 4. Four equal groups of 3.
Finding the total of equal groups by counting in 2s, 5s and 10s	 There are 5 pens in each pack … 5…10…15…20…25…30…35…40…	100 squares and ten frames support counting in 2s, 5s and 10s. 	Use a number line to support repeated addition through counting in 2s, 5s and 10s. 
Year 1 **Division**			

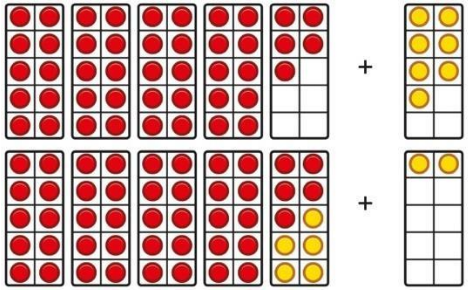
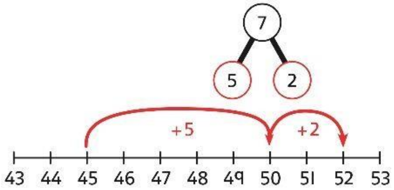
Grouping	Learn to make equal groups from a whole and find how many equal groups of a certain size can be made. Sort a whole set people and objects into equal groups.  There are 10 children altogether. There are 2 in each group. There are 5 groups.	Represent a whole and work out how many equal groups.  There are 10 in total. There are 5 in each group. There are 2 groups.	Children may relate this to counting back in steps of 2, 5 or 10. 
Sharing	Share a set of objects into equal parts and  work out how many are in each part.	Sketch or draw to represent sharing into equal parts. This may be related to fractions. 	Can understand written statements on sharing. 10 shared into 2 equal groups gives 5 in each group.

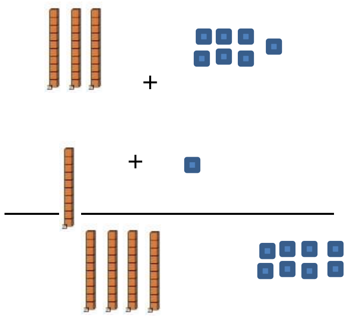
Year 2			
	Concrete	**Pictorial**	**Abstract**
Year 2 Addition			
Understanding 10s and 1s	Group objects into 10s and 1s.  	Understand 10s and 1s equipment, and link with visual representations. Drawing base 10 to aid understanding. 	Represent numbers on a place value grid, using equipment or numerals.  Tens | Ones: 4 | 3

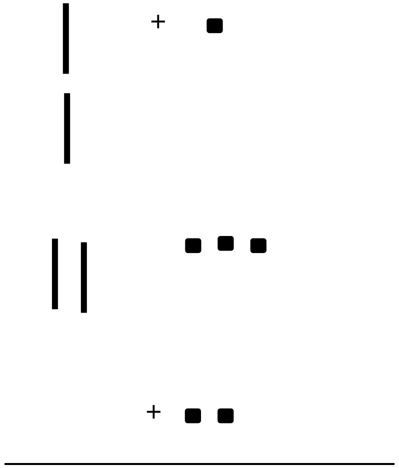
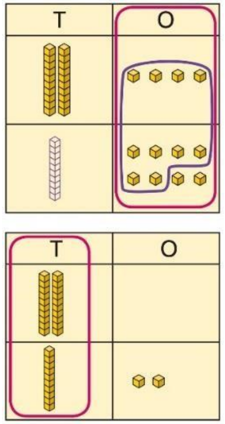
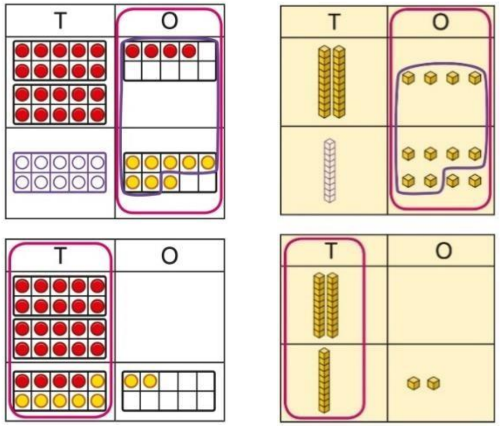
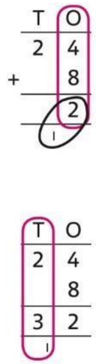
Tens	Ones
4	3

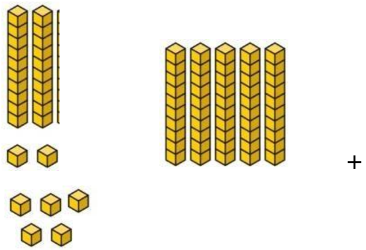
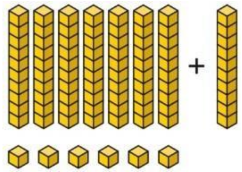
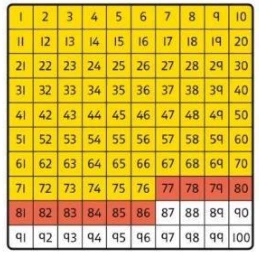
Adding 10s	Use known bonds and unitising to add 10s.  I know that 4 + 3 = 7. So, I know that 4 tens add 3 tens is 7 tens.	Use known bonds and unitising to add 10s.  I know that 4 + 3 = 7. So, I know that 4 tens add 3 tens is 7 tens.	Use known bonds and unitising to add 10s.  4 + 3 = 7 4 tens + 3 tens = 7 tens 40 + 30 = 70

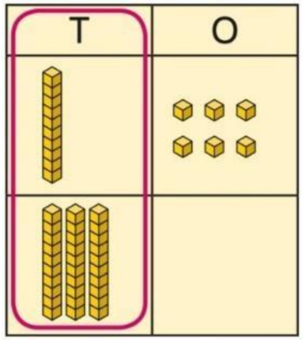
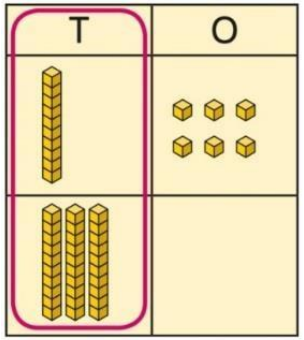
Adding a 1-digit number to a 2-digit number <u>not</u> <u>bridging</u> a 10	Add the 1s to find the total. Use known bonds within 10.  34 is 3 tens and 4 ones. 4 ones and 5 ones are 9 ones. The total is 3 tens and 9 ones. 	Add the 1s. Drawing the representation in base 10 to aid understanding. 	Add the 1s. Understand the link between counting on and using known number facts. Children should be encouraged to use known number bonds to improve efficiency and accuracy.  This can be represented horizontally or vertically with the column method. 34 + 5 = 39 or T O 3 4 + 5 9

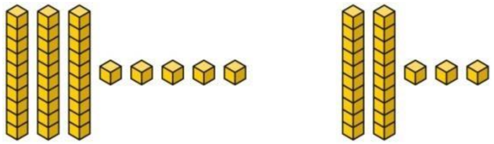
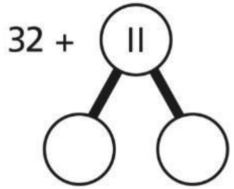
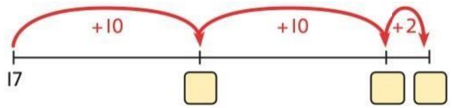
Adding a 1-digit number to a 2-digit number <u>bridging 10</u>	Complete a 10 with objects using number bonds.  There are 4 tens and 5 ones. I need to add 7. I will use 5 to complete a 10, then add 2 more. Can physically use children to aid visualisation and understanding.	Complete a 10 using number bonds drawing tens frames. 	Complete a 10 using number bonds.  7 = 5 + 2 45 + 5 + 2 = 52

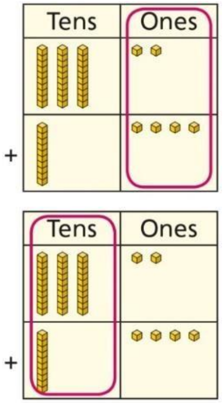
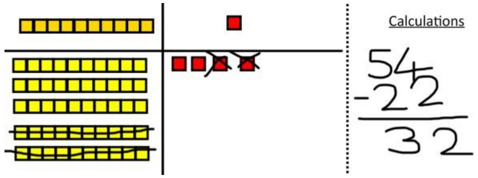
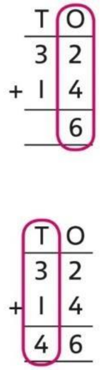
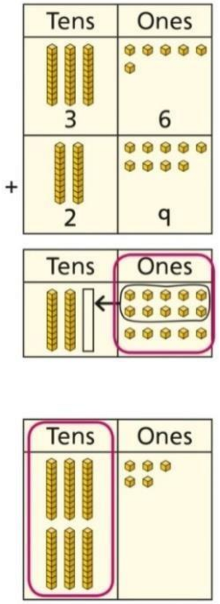
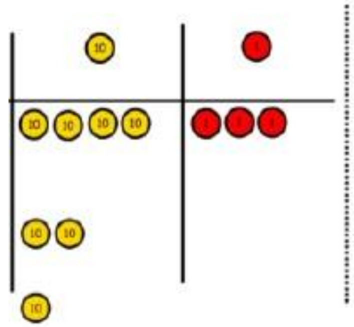
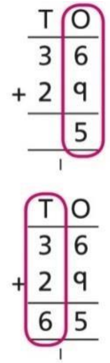
Using the expanded column method	Using base 10 and place value charts to understand the expanded method. 37 + 11 = Tens Ones 	Drawing base 10 to reiterate process. 11 + 12 = Tens Ones	Using the written method to fully grasp concept. 23 + 22 = Tens Ones 20 + 3 20 + 2 ——— 40 + 5

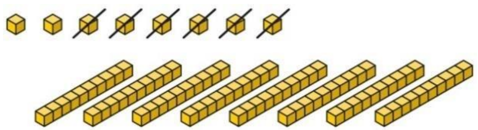
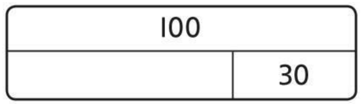
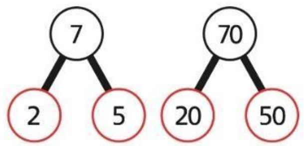
			
Adding a 1-digit number to a 2-digit number using exchange	Using base 10 and place value charts children can exchange 10 ones for 1 ten.  	Drawing a place value chart children can draw 10s and 1s showing clearly how to exchange 10 ones for 1 ten. Either draw base 10 or 10s frames.  	Exchange 10 ones for 1 ten using the column method. Teachers to decide whether they show exchanging at the top or bottom. 

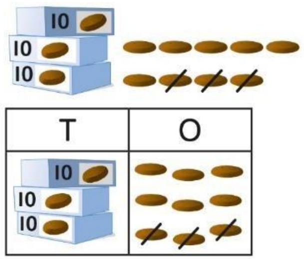
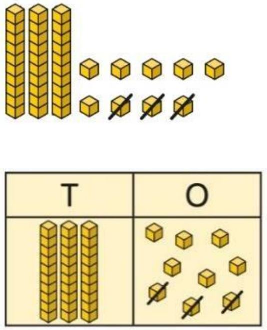
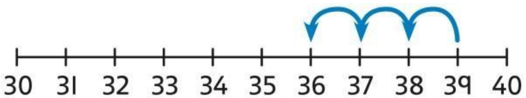
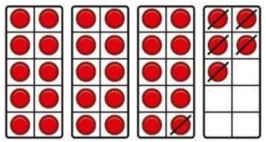
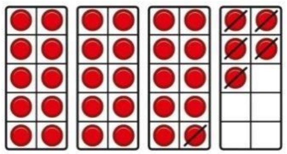
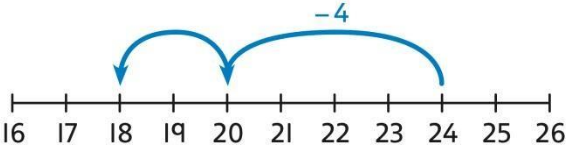
Adding a multiple of 10 to a 2digit number	Add the 10s and then recombine.  27 is 2 tens and 7 ones. 50 is 5 tens. There are 7 tens in total and 7 ones. So, 27 + 50 is 7 tens and 7 ones.	Drawing base 10 to show the process of adding a multiple of 10 then recombining.  66 is 6 tens and 6 ones. 66 + 10 = 76 A 100 square can support this understanding. 	Add the 10s and then recombine. 37 + 20 = ? 30 + 20 = 50 50 + 7 = 57 37 + 20 = 57

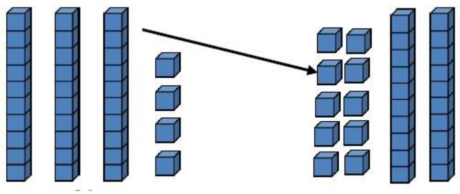
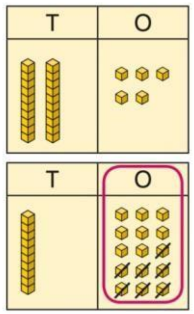
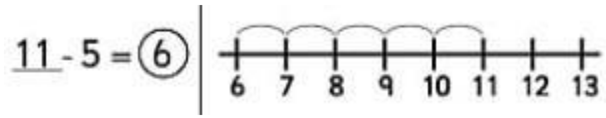
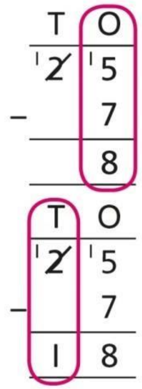
Adding a multiple of 10 to a 2digit number using columns	Add the 10s using a place value grid to support with objects or base 10.  	Children can draw adding the 10s using a place value grid to support. Children partition the numbers to aid understanding.	Add the 10s with the column method. Children must understand how the method relates to unitising of 10s and place value. T O 1 6 + 3 0 4 6 1 + 3 = 4
	16 is 1 ten and 6 ones. 30 is 3 tens. There are 4 tens and 6 ones in total.	 16 is 1 ten and 6 ones. 30 is 3 tens. There are 4 tens and 6 ones in total.	1 ten + 3 tens = 4 tens 16 + 30 = 46

Adding two 2-digit numbers without exchanging	Add the 10s and 1s separately using base 10.  5 + 3 = 8 There are 8 ones in total. 3 + 2 = 5 There are 5 tens in total. 35 + 23 = 58	Add the 10s and 1s separately. Use a part-whole model to support.  11 = 10 + 1 32 + 10 = 42 42 + 1 = 43 32 + 11 = 43	Add the 10s and the 1s separately, bridging 10s where required. A number line can be used first before the column method to support understanding. 17 + 22 

Adding two 2-digit numbers using a place value grid	Physically use base 10 or place value counters. Add the 1s. Then add the 10s using base 10. 	Draw the base 10 or place value counters alongside the written method to help show working out. 	Add the 1s. Then add the 10s. 
Adding two 2-digit numbers with exchange	Make both numbers on a place value grid using base 10 (can then move onto place value counters after) Add the 1s. Exchange 10 ones for a ten. Then add the 10s. 	Children can draw a pictorial representation of the columns and base 10 (as well as place value counters) to further support their learning and understanding. 	Children can use the column method to show how they add the 1s. Exchange 10 ones for a ten. Then add the 10s.  Tens Ones 30 + 6 20 + 9 50 + 15 Expanded method shown alongside to aid understanding. Teachers to decide where to show exchanging using column method.

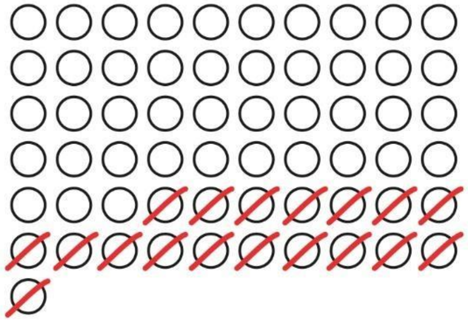
Year 2 Subtraction			
Subtracting multiples of 10	Use known number bonds and unitising to subtract multiples of 10.  8 subtract 6 is 2. So, 8 tens subtract 6 tens is 2 tens.	Use known number bonds and unitising to subtract multiples of 10.  10 − 3 = 7 So, 10 tens subtract 3 tens is 7 tens.	Use known number bonds and unitising to subtract multiples of 10.  7 tens subtract 5 tens is 2 tens. 70 − 50 = 20

Subtracting a single-digit number	Subtract the 1s using objects/base 10 or place value counters. This may be done in or out of a place value grid.  	Subtract the 1s. This may be done in or out of a place value grid.  	Subtract the 1s. Understand the link between counting back and subtracting the 1s using known bonds.  T O 3 9 − 3 3 6 9 − 3 = 6 39 − 3 = 36
Subtracting a single-digit number bridging 10	Bridge 10 by using known bonds.  35 − 6 I took away 5 counters, then 1 more.	Bridge 10 by using known bonds.  35 − 6 First, I will subtract 5, then 1.	Bridge 10 by using known bonds.  24 − 6 = ? 24 − 4 − 2 = ?

Subtracting a single-digit number using exchange	Exchange 1 ten for 10 ones. This may be done in or out of a place value grid using base 10. 34 – 6 = 	Exchange 1 ten for 10 ones. Using a place value chart to draw base 10, physically crossing out the subtracted amount.  	Exchange 1 ten for 10 ones. Use a number line before showing how to use the column method. 11 - 5 =  25 − 7 = 18 

Subtracting a 2-digit number

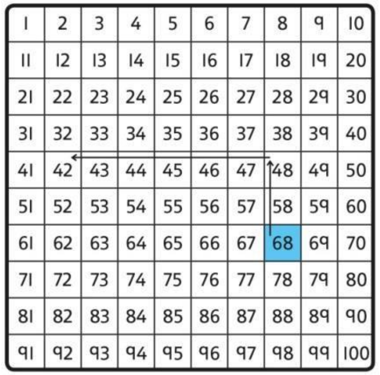
Subtract by taking away.



61 – 18
I took away 1 ten and 8 ones.

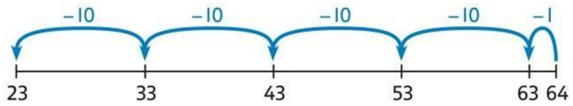
Subtract the 10s and the 1s.

This can be represented on a 100 square.



Subtract the 10s and the 1s.

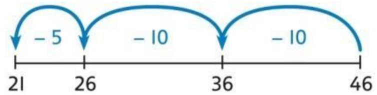
This can be represented on a number line.



64 − 41 = ?

64 − 1 = 63
63 − 40 = 23
64 − 41 = 23

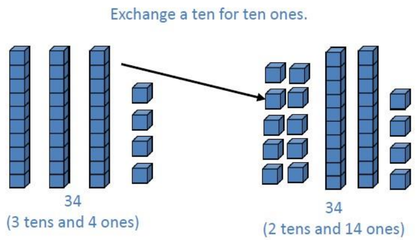
46 − 20 = 26
26 − 5 = 21
46 − 25 = 21



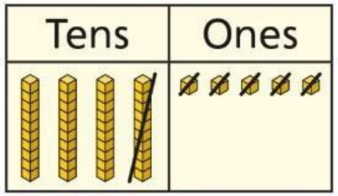
Subtracting a 2-digit number using place value and columns

Subtract the 1s. Then subtract the 10s. This may be done in or out of a place value grid using concrete objects.

34 – 16 =



Draw a place value chart along with the 10s and 1s. Subtract the 1s. Then subtract the 10s (visually crossing out the drawn representation)

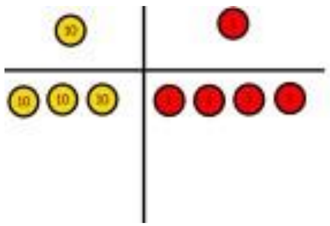
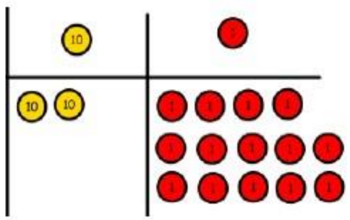
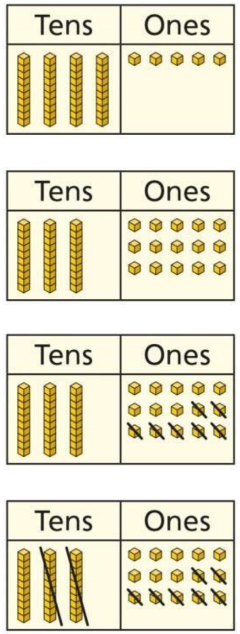
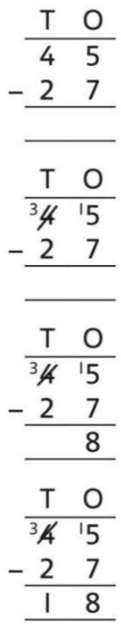


Using column subtraction, subtract the 1s. Then subtract the 10s. Show expanded method alongside.

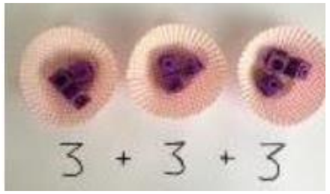
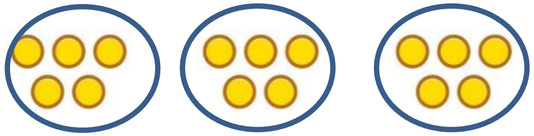
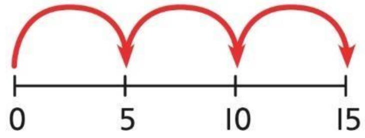
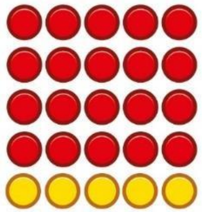
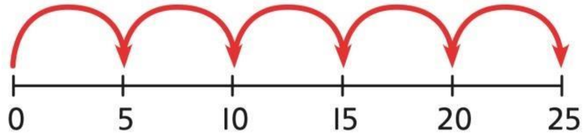
T	O
4	5
– 1	2
	3

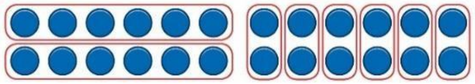
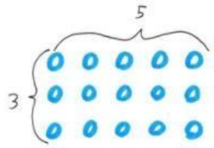
Tens	Ones
40	5
- 10	- 2
30	3

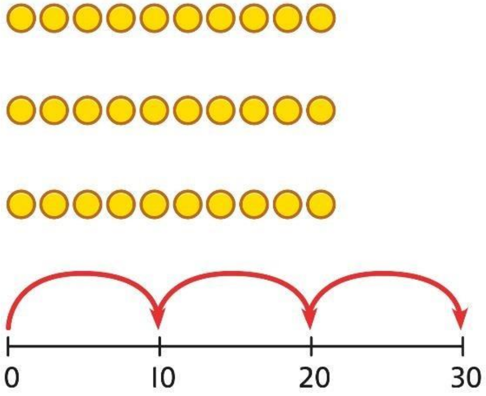
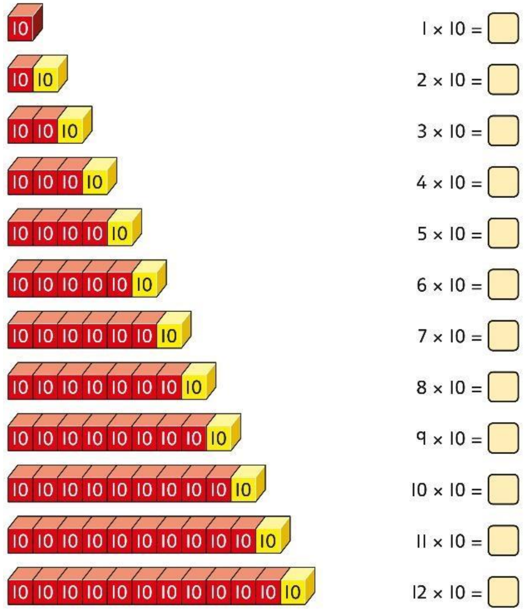
T	O
4	5
– 1	2
3	3

Subtracting a 2-digit number with exchange	Use Base 10 to start with before moving on to place value counters. Clearly show the exchange of 10s to 1s  34 -15 	Using place value charts, draw base 10 or place value counters to show exchanging 1 ten for 10 ones. Then subtract the 1s. Then subtract the 10s.  	Using column subtraction, exchange 1 ten for 10 ones. Then subtract the 1s. Then subtract the 10s. 

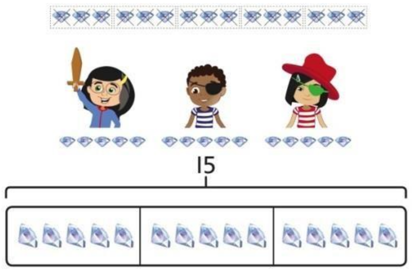
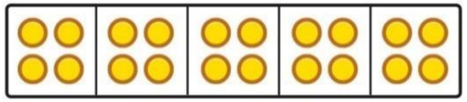
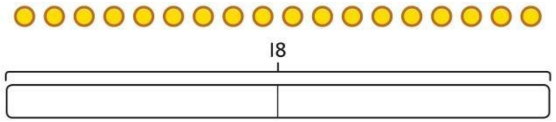
Year 2 Multiplication

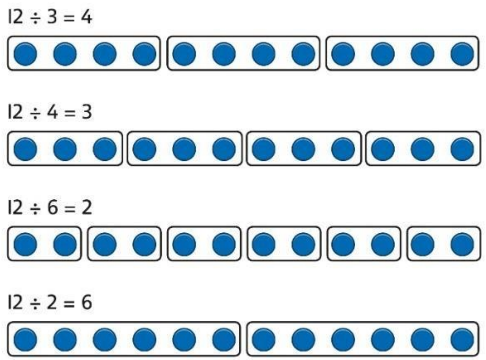
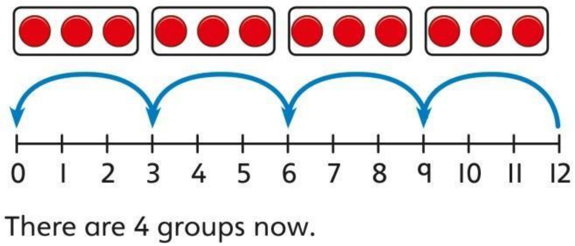
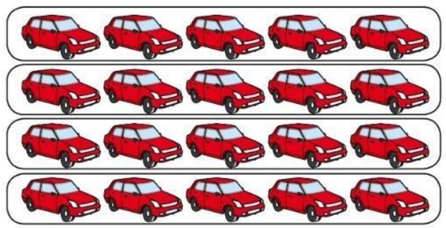
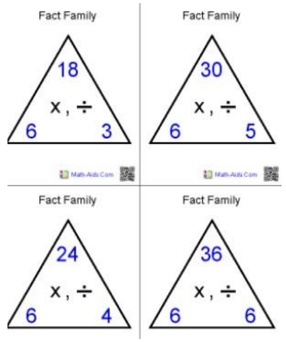
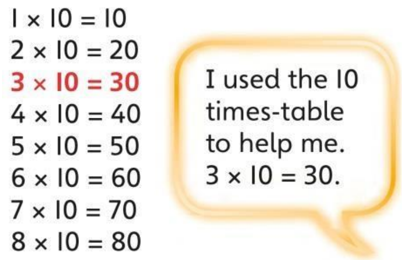
Equal groups and repeated addition	Recognise equal groups and write as repeated addition and as multiplication. 3 groups of 5 children (Physically have the children group together) 15 children altogether Can also model this with cubes. 	Recognise equal groups drawing standard objects such as counters and write as repeated addition and multiplication.  3 groups of 5 15 in total	Use a number line and write as repeated addition and as multiplication.  $5 + 5 + 5 = 15$ $3 \times 5 = 15$
Using arrays to represent multiplication and support understanding	Understand the relationship between arrays, multiplication and repeated addition.  4 groups of 6	Understand the relationship between arrays, multiplication and repeated addition. Draw arrays in different rotations to find **commutative** multiplication sentences.  4 groups of 5 ··· 5 groups of 5	Understand the relationship between arrays, multiplication and repeated addition.  $5 \times 5 = 25$

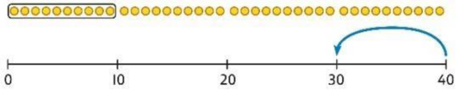
Understanding commutativity	Make arrays using counters to visualise commutativity. Rotate the array to show that orientation does not change the multiplication.  This is 2 groups of 6 and also 6 groups of 2.	Draw arrays visualise commutativity. Rotate the array to show that orientation does not change the multiplication.  3 × 5 = 15 This is 3 lots of 5 but also 5 lots of 3	Use arrays to visualise commutativity.  4 + 4 + 4 + 4 + 4 = 20 5 + 5 + 5 + 5 = 20 4 × 5 = 20 and 5 × 4 = 20

Learning ×2, ×5 and ×10 table facts	Develop an understanding of how to unitise groups of 2, 5 and 10 and learn corresponding times-table facts.  3 groups of 10 ⋯ 10, 20, 30 3 × 10 = 30	Understand how to relate counting in unitised groups and repeated addition with knowing key times-table facts.  10 + 10 + 10 = 30 3 × 10 = 30	Understand how the times-tables increase and contain patterns.  5 × 10 = 50 6 × 10 = 60

Year 2 Division

Sharing equally	Start with a whole number as objects and share into equal parts, one at a  time. 6 ÷ 2 = 3 6 shared equally between 2. They get 3 each. Start to understand how this also relates to grouping. To share equally between 3 people, take a group of 3 and give 1 to each person. Keep going until all the objects have been shared  They get 5 each.	Represent drawn objects shared into equal parts using a bar model.  20 shared into 5 equal parts. There are 4 in each part.	Use a bar model to support understanding of the division.  18 ÷ 2 = 9

	15 shared equally between 3. They get 5 each.		
Grouping equally	Understand how to make equal groups from a whole using people or objects.  8 divided into 4 equal groups. There are 2 in each group.	Understand the relationship between grouping and the division statements.  	Understand how to relate division by grouping to repeated subtraction.  12 divided into groups of 3. 12 ÷ 3 = 4 There are 4 groups.
Using known times-tables to solve divisions	Understand the relationship between multiplication facts and division by using objects.  4 groups of 5 cars is 20 cars in total. 20 divided by 4 is 5.	Use number family triangle to help solve divisions visually.  Link equal grouping with repeated subtraction and known times-table facts to support division.	Relate times-table knowledge directly to division.  I know that 3 groups of 10 makes 30, so I know that 30 divided by 10 is 3. 3 × 10 = 30 so 30 ÷ 10 = 3

		40 divided by 4 is 10.	