Progression towards consistency in written algorithms:

Behaviours that indicate moving towards mathematical fluency:

Addition:

1: 1 correspondence is established and embedded

Count all: children doing 2+4 will count out 2 bricks and then 4 bricks. They will then count them all from 1

Counting on from the first number: 2+4 the child counts on from 2

Counts on from the larger number: 2+4- child uses commutative rule and counts on from the larger number, 4 +2

Children are able to subitise regular and familiar patterns of numbers without counting

Uses known facts

Uses known facts to derive a new fact: 2+5 Child knows 2+4 so adds 1 more, or uses 2+4 to work out 20+40

Child uses knowledge of place value and a bank of known strategies: adds near multiples of 10/100 by adding 10/100 and adjusting e.g. 23+19=23+20-1

Uses known facts to add strings of numbers (doubles, near doubles, number bonds)

Children are familiar with the commutative law as it affects addition

Subtraction:

Counting out: a child finding 9-3 counts 9 fingers then folds down 3 and counts the remaining 6

Counting back from- counts back 3 numbers from 9

Counts back to: counts back from 9 to 3 holding up a finger for each count

Counts up (finds the difference) – child counts up from 3 to 9 (as they become more fluent in using number bonds, they take braver ‘jumps’

Using a known fact- rapid response based on familiarity with number bonds

Uses a derived fact: 20-15-5 so 20-14=6

Uses knowledge of place value partitioning to subtract multiples of 10,100 and then to adjust, e.g. -19 =-20+1

- **Teaching point 1**: Addition is commutative: when the order of the addends is changed, the sum remains the same.
- **Teaching point 2**: Ten can be partitioned into pairs of numbers that sum to ten. Recall of these pairs of numbers supports calculation.
- **Teaching point 3**: Adding one gives one more; subtracting one gives one less.
- **Teaching point 4**: Consecutive numbers have a difference of one; we can use this to solve subtraction equations where the subtrahend is one less than the minuend.
- **Teaching point 5**: Adding two to an odd number gives the next odd number; adding two to an even number gives the next even number. Subtracting two from an odd number gives the previous odd number; subtracting two from an even number gives the previous even number.
- **Teaching point 6**: Consecutive odd / consecutive even numbers have a difference of two; we can use this to solve subtraction equations where the subtrahend is two less than the minuend.
- **Teaching point 7**: When zero is added to a number, the number remains unchanged; when zero is subtracted from a number, the number remains unchanged.
- **Teaching point 8**: Subtracting a number from itself gives a difference of zero.
- **Teaching point 9**: Doubling a whole number always gives an even number and can be used to add two equal addends; halving is the inverse of doubling and can be used to subtract a number from its double. Memorised doubles/halves can be used to calculate near-doubles/halves.
- **Teaching point 10**: Addition and subtraction facts for the pairs five and three, and six and three, can be related to known facts and strategies.

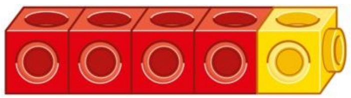
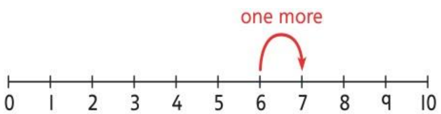
Year 1

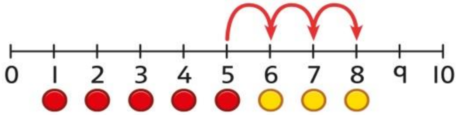
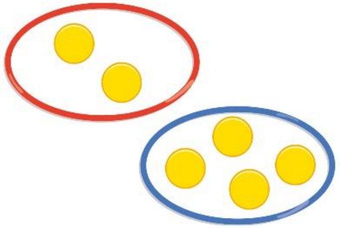
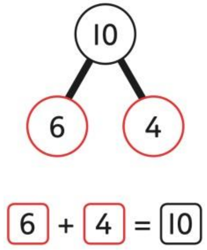
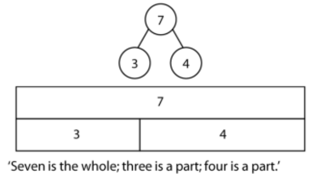
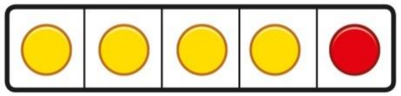
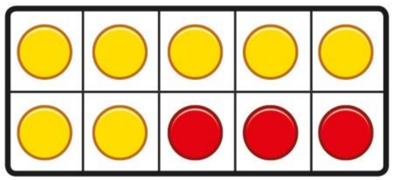
Aggregation and partitioning

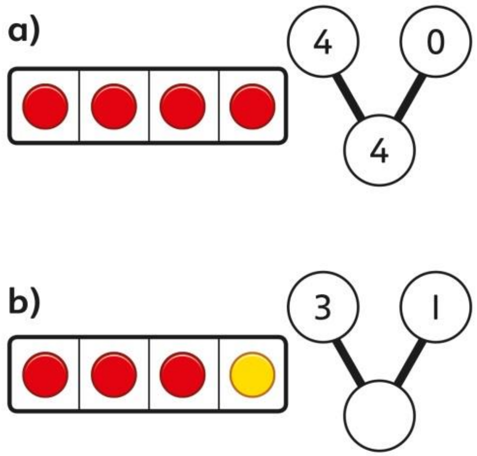
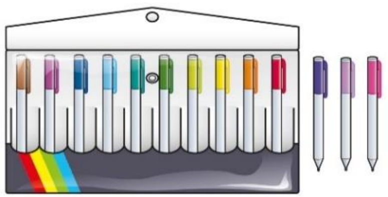
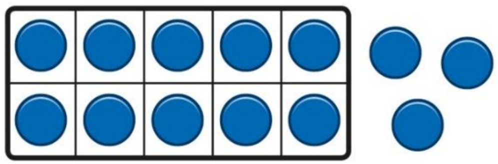
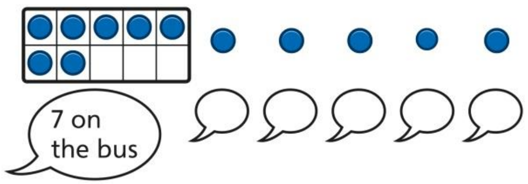
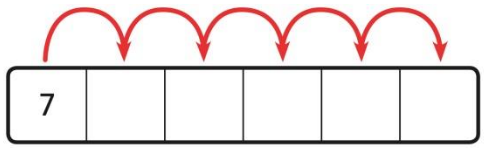
- **Teaching point 1:** combining two or more parts to make a whole is called aggregation; the addition symbol, +, can be used to represent aggregation.
- **Teaching point 2:** The equals symbol, =, can be used to show equivalence between the whole and the sum of the parts.
- **Teaching point 3:** Each addend represents a part, and these are combined to form the whole/sum; we can find the value of the whole by adding the parts. We can represent problems with missing parts using an addition equation with a missing addend

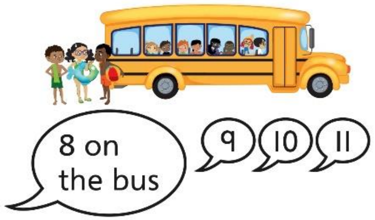
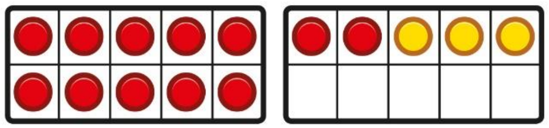
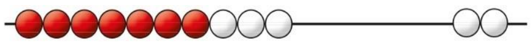
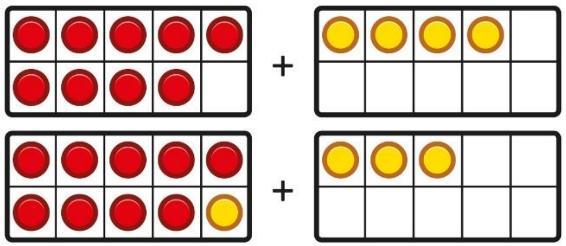
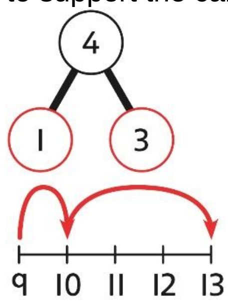
Augmentation and reduction

- **Teaching point 1:** An addition context described by a *'first…, then…, now…'* story is an example of augmentation. We can link the story to a numerical representation – each number represents something in the story.
- **Teaching point 2:** Given any two parts of the story we can work out the third part; given any two numbers in the equation we can find the third one.

	Concrete	Pictorial	Abstract
Year 1 Addition **Range of Concrete resources:** **Real objects** **Counters** **Deines** **Bead strings** **Number lines** **!00 squares**	**Counting and adding more** Children add one more person or object to a group to find one more.	**Counting and adding more** Children add one more cube or counter to a group to represent one more.  *One more than 4 is 5.*	**Counting and adding more** 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.

Numicon **Number Blocks** **Interlocking Cubes** **Number tracks** **Games and songs**			 *5 + 3 = 8*
	Understanding part-part-whole relationship Sort people and objects into parts and understand the relationship with the whole.  *The parts are 2 and 4. The whole is 6.*	**Understanding part-part-whole relationship** Children draw to represent the parts and understand the relationship with the whole.  *The parts are 1 and 5. The whole is 6.*	**Understanding part-part-whole relationship** Use a part-whole model to represent the numbers.   *6 + 4 = 10*
Vocabulary: Add addend More Make Equals Sum Altogether 'There are… and…' 'We can write this as __ plus __' 'The __ represents the…' 'The __ represents the…'	**Knowing and finding number bonds within 10** Break apart a group and put back together to find and form number bonds.  *3 + 4 = 7*  *6 = 2 + 4*	**Knowing and finding number bonds within 10** Use five and ten frames to represent key number bonds.  *5 = 4 + 1*  *10 = 7 + 3*	**Knowing and finding number bonds within 10** Use a part-whole model alongside other representations to find number bonds. Make sure to include examples where one of the parts is zero.

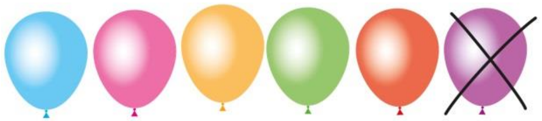
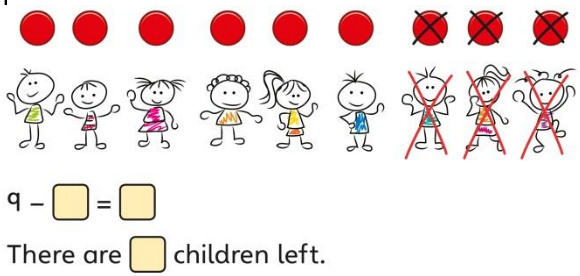
	• ***'___ is equal to ___ plus ___.'*** • ***'___ plus ___ is equal to ___.'*** • ***'___ and ___ are the addends.'*** • ***'___ is the sum.'***		 *4 + 0 = 4* *3 + 1 = 4*
	Understanding teen numbers as a complete 10 and some more Complete a group of 10 objects and count more.  *13 is 10 and 3 more.*	**Understanding teen numbers as a complete 10 and some more** Use a ten frame to support understanding of a complete 10 for teen numbers.  *13 is 10 and 3 more.*	**Understanding teen numbers as a complete 10 and some 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.	**Adding by counting on** Children use counters to support and represent their counting on strategy.  	**Adding by counting on** Children use number lines or number tracks to support their counting on strategy.  7 + 5 =

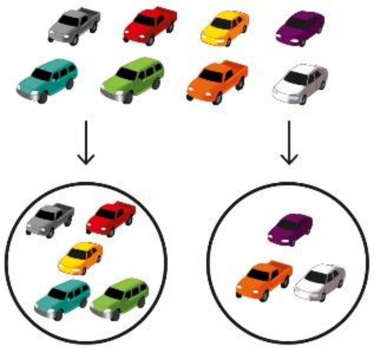
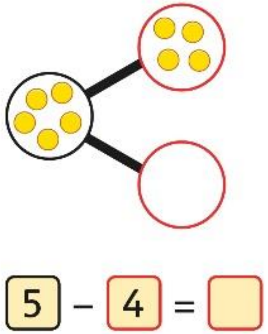
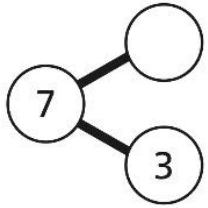
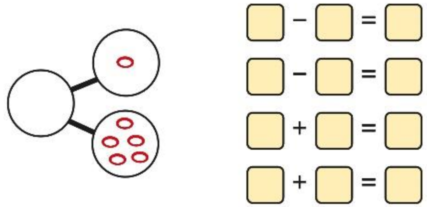
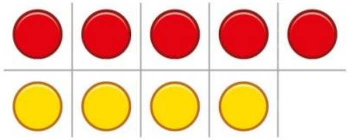
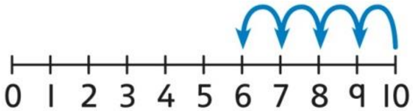
			
	Adding the 1s Children use bead strings to recognise how to add the 1s to find the total efficiently.  *2 + 3 = 5* *12 + 3 = 15*	**Adding the 1s** Children represent calculations using ten frames to add a teen and 1s.  *2 + 3 = 5* *12 + 3 = 15*	**Adding the 1s** Children recognise that a teen is made 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.*	**Bridging the 10 using number bonds** Children use counters to complete a ten frame and understand how they can add using knowledge of number bonds to 10.  .	**Bridging the 10 using number bonds** Use a part-whole model and a number line to support the calculation.  *9 + 4 = 13*

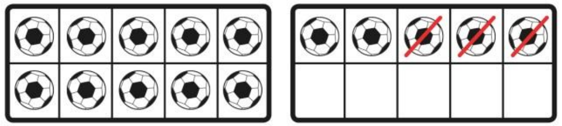
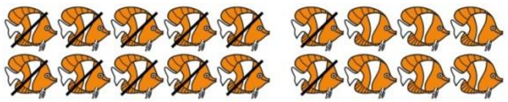
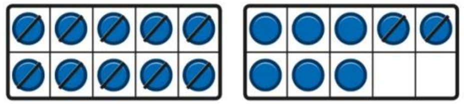
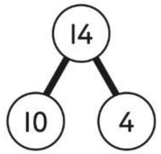
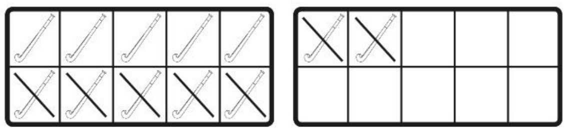
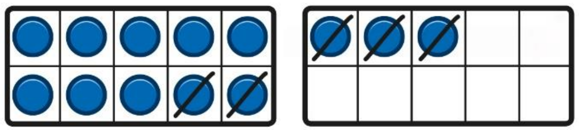
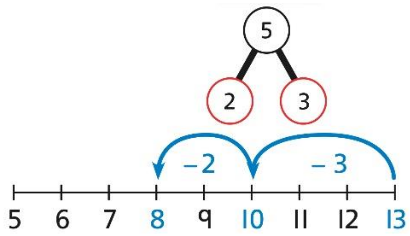
Subtraction

- **Aggregation and partitioning**
- **Teaching point 1:** Each addend represents a part, and these are combined to form the whole/sum; we can find the value of the whole by adding the parts. We can represent problems with missing parts using an addition equation with a missing addend.
- **Teaching point 2:** Breaking a whole down into two or more parts is called partitioning; the subtraction symbol, −, can be used to represent partitioning.

- **Augmentation and reduction**
- **Teaching point 1:** A subtraction context described by a *'first…, then…, now…'* story is an example of reduction. We can link the story to a numerical representation – each number represents something in the story.
- **Teaching point 2:** Given any two parts of the story we can work out the third part; given any two numbers in the equation we can find the third one.
- **Teaching point 3:** Addition and subtraction are inverse operations.

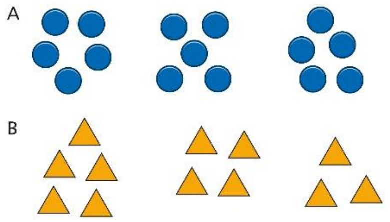
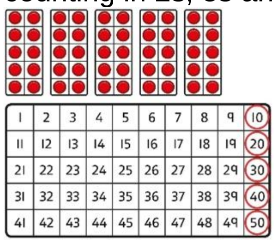
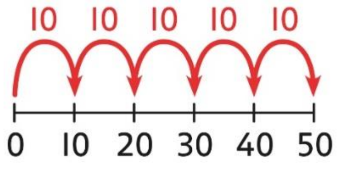
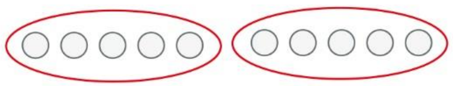
Year 1 Subtraction **Range of Concrete resources:** **Real objects** **Counters** **Deines** **Bead strings** **Number lines** **!00 squares** **Numicon**	**Counting back and taking away** Children arrange objects and remove to find how many are left.  *1 less than 6 is 5.* *6 subtract 1 is 5.*	**Counting back and taking away** Children draw and cross out or use counters to represent objects from a problem.  	**Counting back and taking away** 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	**Finding a missing part, given a whole and a part**	**Finding a missing part, given a whole and a part**

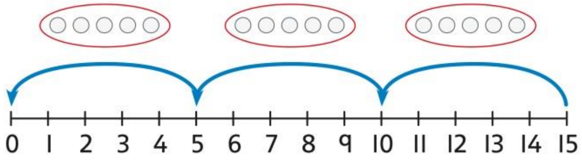
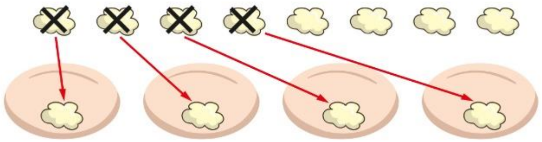
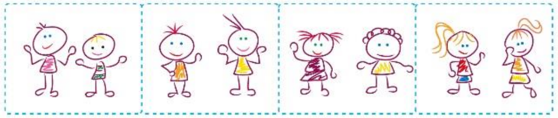
Number Blocks **Interlocking Cubes** **Number tracks** **Games and songs** **Vocabulary:** **Subtract** **Then/now** **Take** **Take away** **Left** **Over** **Less** **Difference** **count back**	Children separate a whole into parts and understand how one part can be found by subtraction.  *8 − 5 = ?*	Children represent a whole and a part and understand how to find the missing part by subtraction.  	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. 
'first…, then…, now…'	**Finding the difference** Arrange two groups 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.*	**Finding the difference** Represent objects using sketches or counters to support finding the difference.  *5 − 4 = 1* *The difference between 5 and 4 is 1.*	**Finding the difference** 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*	**Subtraction within 20** Understand when and how to subtract 1s efficiently.  *5 − 3 = 2* *15 − 3 = 12*	**Subtraction within 20** 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.*	**Subtracting 10s and 1s** For example: 18 − 12 Use ten frames to represent the efficient method of subtracting 12.  *First subtract the 10, then subtract 2.*	**Subtracting 10s and 1s** 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.*	**Subtraction bridging 10 using number bonds** 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.*	**Subtraction bridging 10 using number bonds** Use a number line and a part-whole model to support the method. *13 − 5* 

Multiplication and Division

- **Teaching point 1**: We can count efficiently by counting in groups of two.
- **Teaching point 2**: We can count efficiently by counting in groups of ten.
- **Teaching point 3**: We can count efficiently by counting in groups of five.

Year 1 Multiplication **Skip counting Finding pairs** *'Three groups of two, four groups of two, five groups of two…'* *'Three twos, four twos, five twos…'* *'Six, eight, ten…'*	**Recognising and making equal groups** Children arrange objects in equal and unequal groups and understand how to recognise whether they are equal. 	**Recognising and making equal groups** 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…	**Finding the total of equal groups by counting in 2s, 5s and 10s** 100 squares and ten frames support counting in 2s, 5s and 10s. 	**Finding the total of equal groups by 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.	**Grouping** Represent a whole and work out how many equal groups. 	**Grouping** Children may relate this to counting back in steps of 2, 5 or 10.

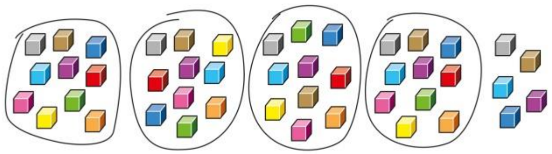
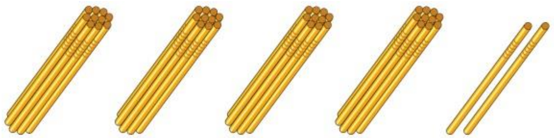
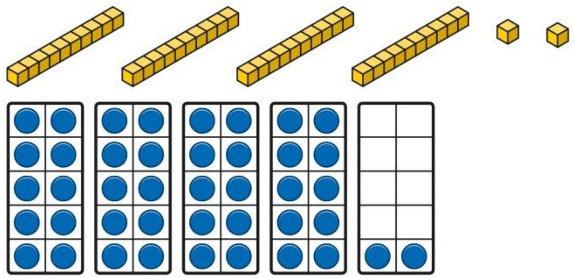
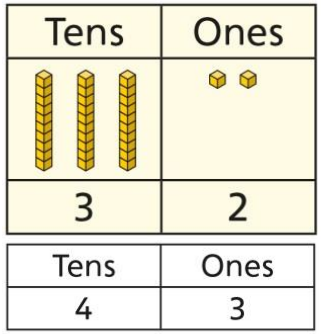
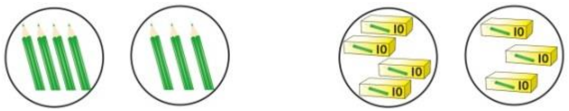
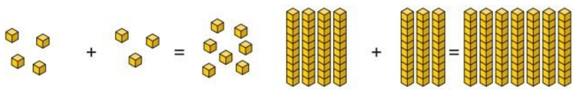
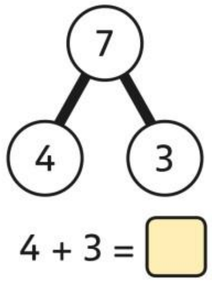
	 *There are 10 children altogether.* *There are 2 in each group.* *There are 5 groups.*	*There are 10 in total.* *There are 5 in each group.* *There are 2 groups.*	
	Sharing Share a set of objects into equal parts and work out how many are in each part**.** 	**Sharing** Sketch or draw to represent sharing into equal parts. This may be related to fractions. 	**Sharing** *10 shared into 2 equal groups gives 5 in each group.*

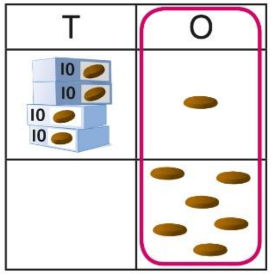
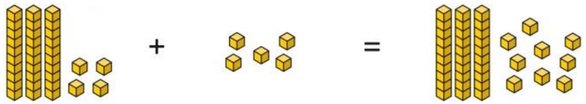
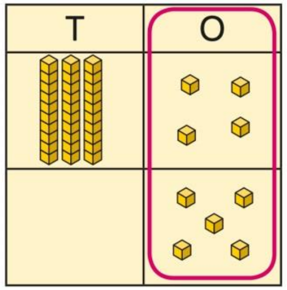
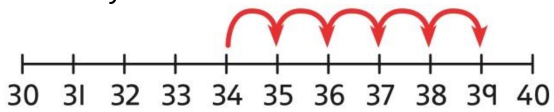
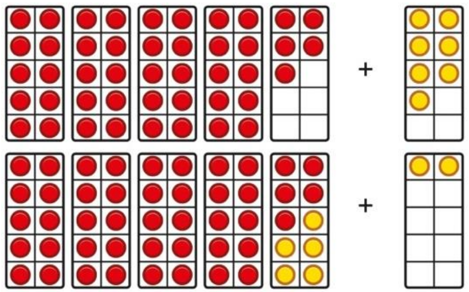
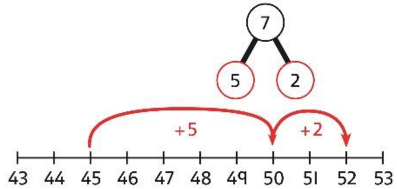
<table>
<tr><th colspan="4">Year 2</th></tr>
<tr><td></td><td>Concrete</td><td>Pictorial</td><td>Abstract</td></tr>
<tr><td>Year 2
Addition

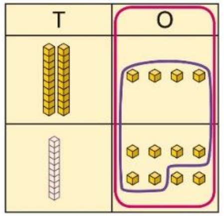
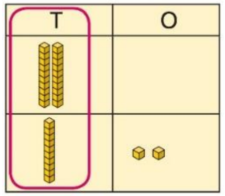
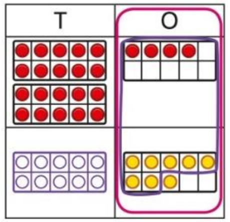
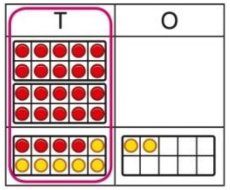
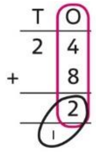
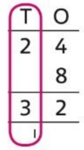
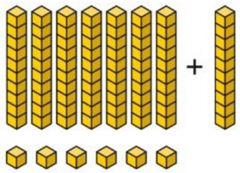
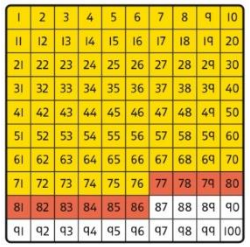
'There are ___, ___ and ___.
Altogether there are ___.'

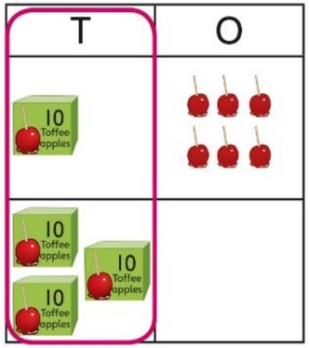
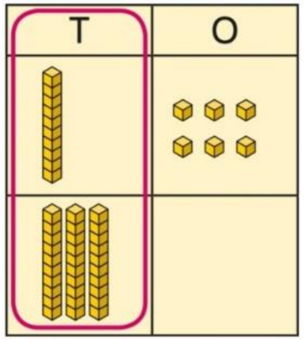
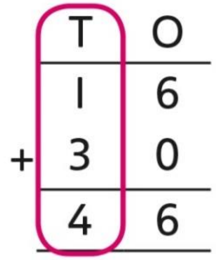
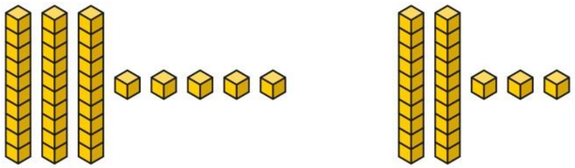
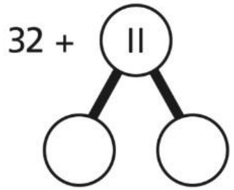
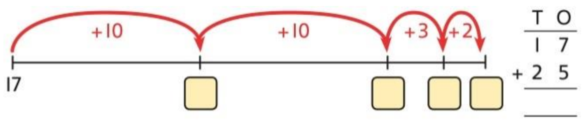
'When we add three numbers, the total will be the same whichever pair we add first.'

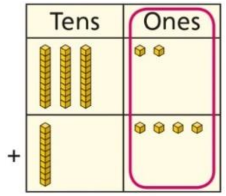
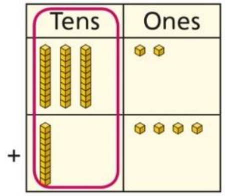
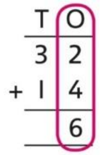
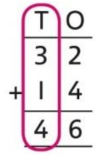
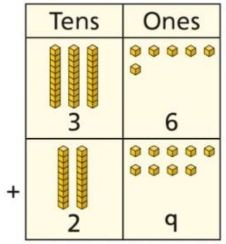
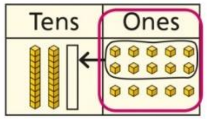
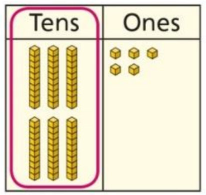
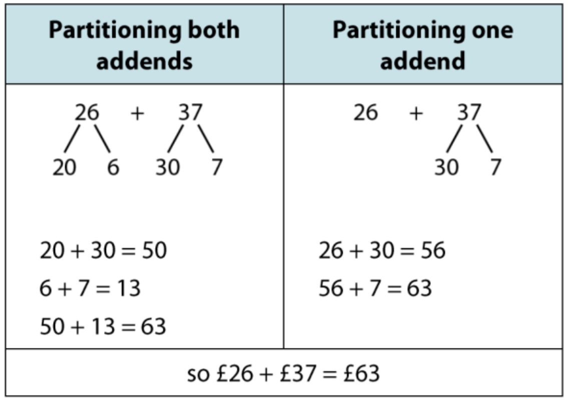
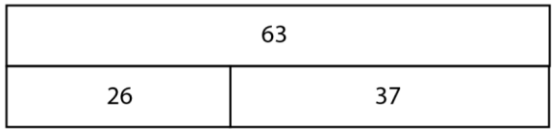
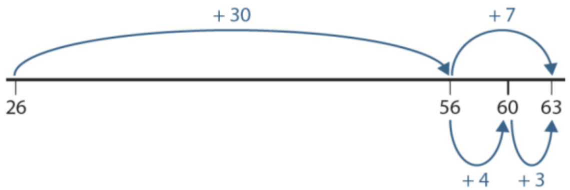
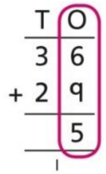
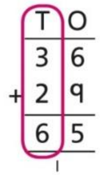
first…, then…, then…, now…'</td><td colspan="3">
Teaching point 1: Addition of three addends can be described by an aggregation story with three parts.
Teaching point 2: Addition of three addends can be described by an augmentation story with a 'first…, then…, then…, now…' structure.
Teaching point 3: The order in which addends (parts) are added or grouped does not change the sum (associative and commutative laws).
Teaching point 4: When we are adding three numbers, we choose the most efficient order in which to add them, including identifying two addends that make ten (combining).
Teaching point 5: We can add two numbers which bridge the tens boundary by using a 'make ten' strategy.
Teaching point 6: We can subtract across the tens boundary by subtracting through ten or subtracting from ten.
Teaching point 7: Knowledge of the number line, and quantity values of numbers, can be applied to add/subtract one to/from a given two-digit number.
Teaching point 8: Known facts for the numbers within ten can be applied to addition/subtraction of a single-digit number to/from a two-digit number.
Teaching point 9: Knowledge of numbers which sum to ten can be applied to the addition of a single-digit number and two-digit number that sum to a multiple of ten, or subtraction of a single-digit number from a multiple of ten.
Teaching point 10: Known strategies for addition or subtraction bridging ten can be applied to addition or subtraction bridging a multiple of ten.
teaching point 11: When finding ten more or ten less than any two-digit number, the ones digit does not change.
Teaching point 12: When ten is added or subtracted to/from a two-digit number, the tens digit changes and the ones digit stays the same.
</td></tr>
</table>

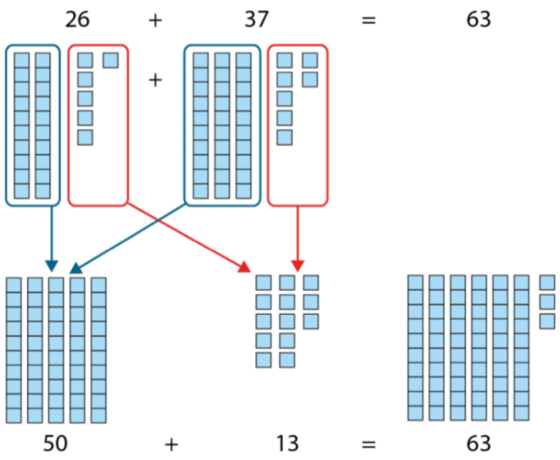
	• **Teaching point 13**: Knowledge of number facts within ten can be applied to adding or subtracting multiples of ten to/from a two-digit number. • **Teaching point 14**: Two-digit numbers can be partitioned in different ways. • **Teaching point 15**: Known strategies can be combined to add two multiples of ten to two single-digit numbers. • **Teaching point 16**: Two two-digit numbers can be added by partitioning one or both of them into tens and ones.		
Understanding 10s and 1s *'___ is one more than ___. ___ is equal to ___ plus one. ___ plus one is equal to ___.'*	Group objects into 10s and 1s.  Bundle straws to understand unitising of 10s. 	Understand 10s and 1s equipment, and link with visual representations on ten frames. 	Represent numbers on a place value grid, using equipment or numerals. 
Adding 10s *'When we find ten more, the tens digit changes and the ones digit stays the same.'* *'When we find ten less, the tens digit changes and the ones digit stays the same.'*	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*

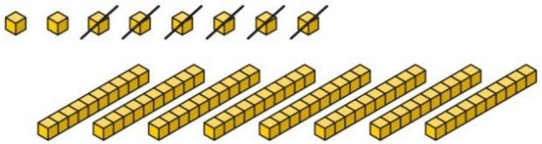
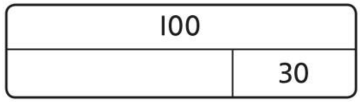
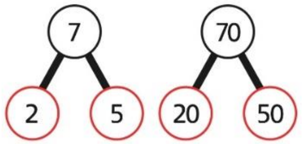
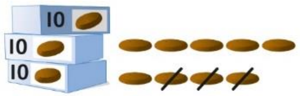
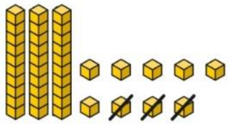
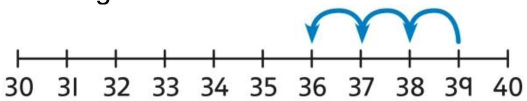
Adding a 1-digit number to a 2-digit number not bridging a 10	Add the 1s to find the total. Use known bonds within 10.  *41 is 4 tens and 1 one.* *41 add 6 ones is 4 tens and 7 ones.* This can also be done in a place value grid. 	Add the 1s.  *34 is 3 tens and 4 ones.* *4 ones and 5 ones are 9 ones.* *The total is 3 tens and 9 ones.* 	Add the 1s. 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. *34 + 5 = 39* *or* T O 3 4 + 5 9
Adding a 1-digit number to a 2-digit number bridging 10	Complete a 10 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.*	Complete a 10 using number bonds. 	Complete a 10 using number bonds.  *7 = 5 + 2* *45 + 5 + 2 = 52*
Adding a 1-digit number to a 2-digit	Exchange 10 ones for 1 ten.	Exchange 10 ones for 1 ten.	Exchange 10 ones for 1 ten.

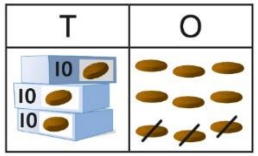
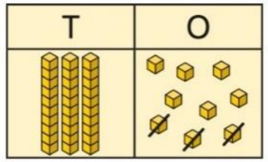
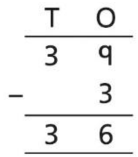
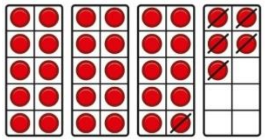
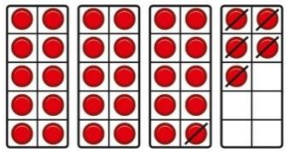
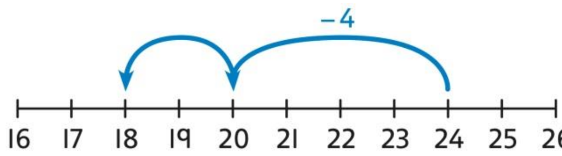
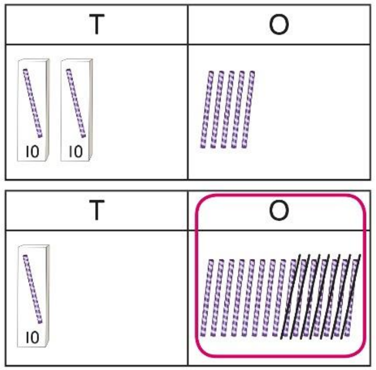
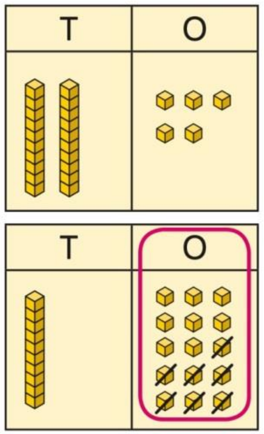
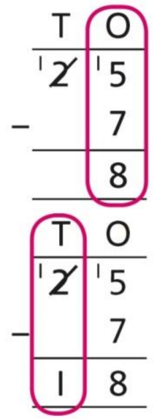
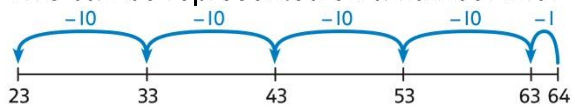
number using exchange	 	 	 
Adding a multiple of 10 to a 2-digit number	Add the 10s and then recombine.  *27 is 2 tens and 7 ones.* *50 is 5 tens.* *There are 7 tens in total and 7 ones.* *So, 27 + 50 is 7 tens and 7 ones.*	Add the 10s and then recombine.  *66 is 6 tens and 6 ones.* *66 + 10 = 76* A 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 2-digit number using columns	Add the 10s using a place value grid to support.	Add the 10s using a place value grid to support.	Add the 10s represented vertically. Children must understand how the method relates to unitising of 10s and place value.

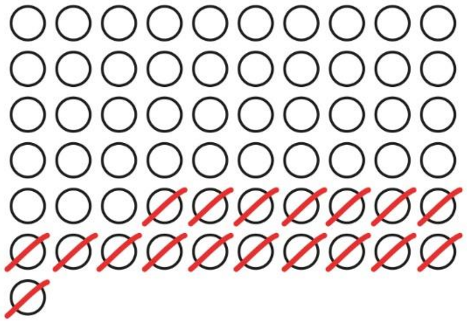
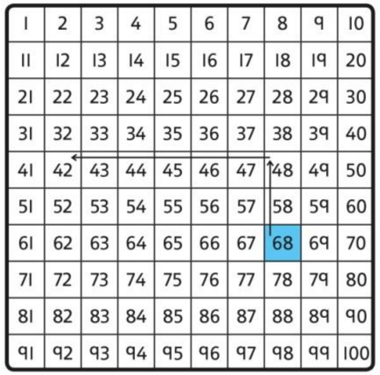
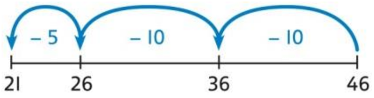
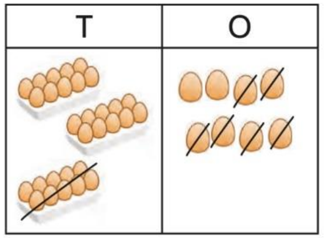
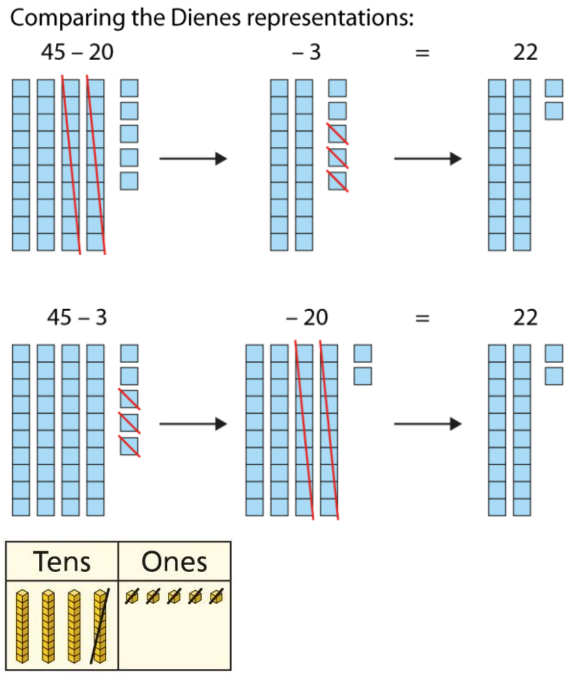
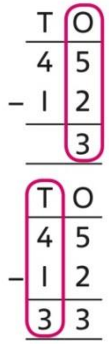
	 *16 is 1 ten and 6 ones.* *30 is 3 tens.* *There are 4 tens and 6 ones in total.*	 *16 is 1 ten and 6 ones.* *30 is 3 tens.* *There are 4 tens and 6 ones in total.*	 *1 + 3 = 4* *1 ten + 3 tens = 4 tens* *16 + 30 = 46*
Adding two 2-digit numbers	Add the 10s and 1s separately.  *5 + 3 = 8* *There are 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 support the calculations.  *17 + 25* *10+20+7+5=* *Expanded method*
Adding two 2-digit numbers using a place value grid	Add the 1s. Then add the 10s.		Add the 1s. Then add the 10s.

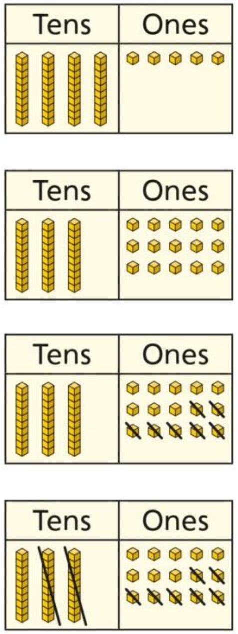
	 		 
Adding two 2-digit numbers with exchange	Add the 1s. Exchange 10 ones for a ten. Then add the 10s.   	  26 + 30 + 7 	Add the 1s. Exchange 10 ones for a ten. Then add the 10s. Again show on number lines and through expanded method, shortening to the exchange 30 + 6 <u>20 + 9</u> <u>50 + 15 = 65</u>  

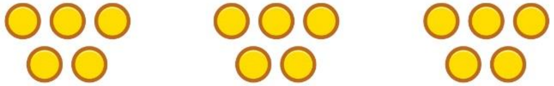
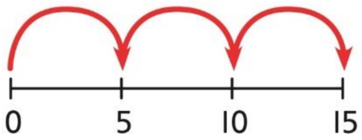
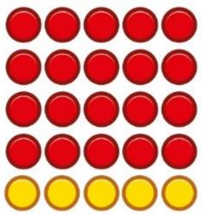
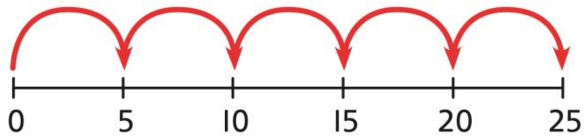
			
Year 2 **Subtraction** **Vocabulary** **Subtract** **Minus** **Difference** **First…then… now** **Partition** **Tens** **Ones** **Exchange** **Bridge** *'___ is one less than ___. ___ minus one is ___. The difference between ___ and ___ is one.'*	• **Teaching point 1**: We can subtract across the tens boundary by subtracting *through* ten or subtracting *from* ten. • **Teaching point 2**: Knowledge of the number line, and quantity values of numbers, can be applied to add/subtract one to/from a given two-digit number. • **Teaching point 3**: Known facts for the numbers *within* ten can be applied to addition/subtraction of a single-digit number to/from a two-digit number. • **Teaching point 4**: Knowledge of numbers which sum to ten can be applied to the addition of a single-digit number and two-digit number that sum to a multiple of ten, or subtraction of a single-digit number from a multiple of ten. • **Teaching point 5**: Known strategies for addition or subtraction bridging ten can be applied to addition or subtraction bridging a multiple of ten. • **Teaching point 6**: Difference compares the number of objects in one set with the number of objects in another set; or the difference between two measures. • **Teaching point 7**: Difference is one of the structures of subtraction. • **Teaching point 8**: Consecutive whole numbers have a difference of one; consecutive odd/even numbers have a difference of two. • **Teaching point 9**: We can apply the structure of difference to compare data.		

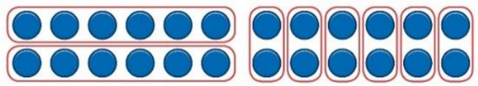
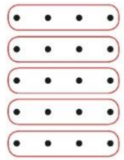
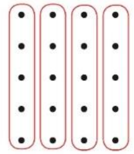
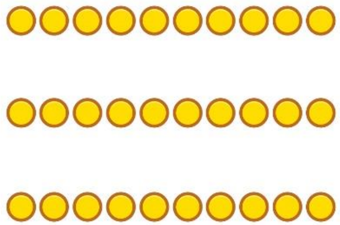
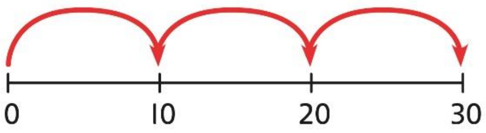
	• **Teaching point 10**: When finding ten more or ten less than any two-digit number, the ones digit does not change. • **Teaching point 11**: When ten is added or subtracted to/from a two-digit number, the tens digit changes and the ones digit stays the same. • **Teaching point 12**: Knowledge of number facts within ten can be applied to adding or subtracting multiples of ten to/from a two-digit number. **Teaching point 13**: Known strategies can be used to subtract a multiple of ten and a single-digit number from a two-digit number. • **Teaching point 14**: A two-digit number can be subtracted from a two-digit number by partitioning the subtrahend into tens and ones.		
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. 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. 

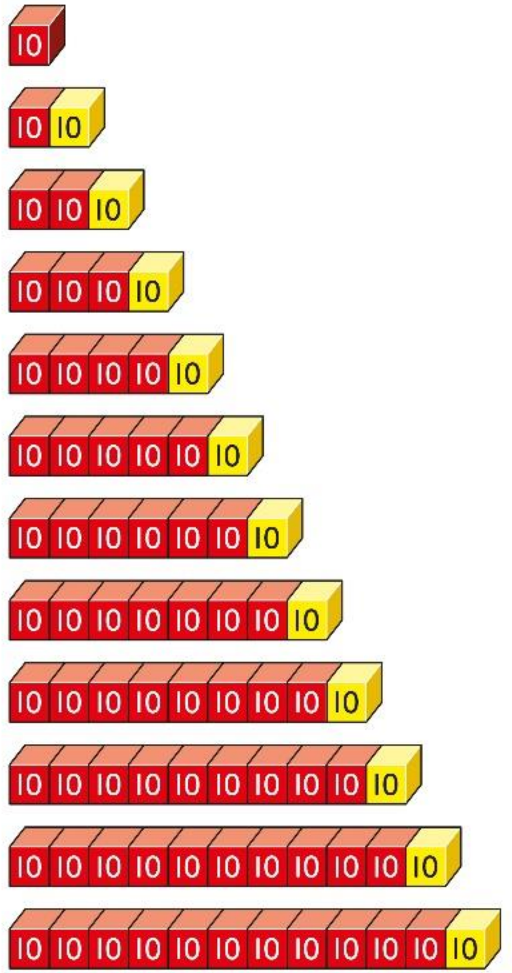
			 *9 − 3 = 6* *39 − 3 = 36*
Subtracting a single-digit number bridging 10	Bridge 10 by using known bonds.  *35 − 6* *I took away 5 counters, then 1 more.*	Bridge 10 by using known bonds.  *35 − 6* *First, I will subtract 5, then 1.*	Bridge 10 by using known bonds.  *24 − 6 = ?* *24 − 4 − 2 = ?*
Subtracting a single-digit number using exchange	Exchange 1 ten for 10 ones. This may be done in or out of a place value grid. 	Exchange 1 ten for 10 ones. 	Exchange 1 ten for 10 ones.  *25 − 7 = 18*
Subtracting a 2-digit number	Subtract by taking away.	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. 

	 *61 − 18* *I took away 1 ten and 8 ones.*		*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.  *38 − 16 = 22*	Subtract the 1s. Then subtract the 10s. 	Using column subtraction, subtract the 1s. Then subtract the 10s. 
Subtracting a 2-digit number with exchange		Exchange 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.

			T O 4 5 − 2 7 T O ^{3}~~4~~ ^{1}5 − 2 7 T O ^{3}~~4~~ ^{1}5 − 2 7 8 T O ^{3}~~4~~ ^{1}5 − 2 7 1 8
Year 2 Multiplication **Use real objects in equal groups** **Vocabulary:** **Equal groups** **Product** **Times** **Array** **Commutative** **Times tables** **Adding**	• **Teaching point 1**: Objects can be grouped into equal or unequal groups. • **Teaching point 2**: When describing equally grouped objects, the number of groups and the size of the groups must both be defined. • **Teaching point 3**: Equal groups can be represented with a repeated addition expression. • **Teaching point 4**: Equal groups can be represented with a multiplication expression. **Teaching point 5**: Multiplication expressions can be written for cases where the groups each contain zero items, and for cases where the groups each contain one item. • **Teaching point 6**: For equally grouped objects, the number of groups is a factor, the group size is a factor, and the overall number of objects is the product; this can be represented with a multiplication equation. Counting in multiples of two can be used to find the product when the group size is two. **Teaching point 7**: Factor pairs can be written in either order, with the product remaining the same (commutativity). • **Teaching point 8**: The same multiplication equation can have two different grouping interpretations. Problems about two/five/ten equal groups can be solved using facts from the two/five/ten times table. (commutativity) **Teaching point 9**: If two is a factor, knowledge of doubling facts can be used to find the product; problems about		

	doubling can be solved using facts from the two times table. **Teaching point 10**: Products in the ten times table are double the products in the five times table; products in the five times table are half of the products in the ten times table.		
Equal groups and repeated addition Before grouping: ***'There are some ___.'*** After grouping: ***'The ___ have been grouped.'*** ***'The groups are equal because there are the same number of ___ in each group.'*** ***'The groups are unequal because there are a different number of ___ in each group.'*** ***There are ___ equal groups of ___.'*** ***There are ___ ___ in each group.'*** ***There are ___ groups of ___.'*** ***'There are ___ and ___ and ___ and…'*** ***'We can write this as ___ plus ___ plus ___ plus…'***	Recognise equal groups and write as repeated addition and as multiplication.  *3 groups of 5 chairs* *15 chairs altogether*	Recognise equal groups using 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 × 5 = 15* ***'There are ___ groups of ___.'*** o the multiplication expression: ___ × ___
Using arrays to represent multiplication and support understanding **Groups of times**	Understand the relationship between arrays, multiplication and repeated addition.  *4 groups of 5*	Understand the relationship between arrays, multiplication and repeated addition.  *4 groups of 5 … 5 groups of 5*	Understand the relationship between arrays, multiplication and repeated addition.  *5 × 5 = 25*
Understanding commutativity	Use arrays to visualise commutativity.	Form arrays using counters to visualise commutativity. Rotate the array to show that orientation does not change the multiplication.	Use arrays to visualise commutativity.

	 *I can see 6 groups of 3.* *I can see 3 groups of 6.*	 *This is 2 groups of 6 and also 6 groups of 2.*	  *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 • factor × factor = product • product = factor × factor	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 **Use of real contexts and resources**	**Teaching point 1**: Halving is the inverse of doubling; problems about halving can be solved using facts from the two times table and known doubling facts. • **Teaching point 1**: Objects can be grouped equally, sometimes with a remainder.		

<table>
<tr>
<td>Vocabulary
Share
Group
Groups of
Remainder
Dividend
Divisor
Halve</td>
<td colspan="3">

Teaching point 2: Division equations can be used to represent ‘grouping’ problems, where the total quantity (dividend) and the group size (divisor) are known; the number of groups (quotient) can be calculated by skip counting in the divisor. (quotative division)
Teaching point 3: Division equations can be used to represent ‘sharing’ problems, where the total quantity (dividend) and the number we are sharing between (divisor) are known; the size of the shares (quotient) can be calculated by skip counting in the divisor. (partitive division)
Teaching point 4: Strategies for finding the quotient, that are more efficient than skip counting, include using known multiplication facts and, when the divisor is two, using known halving facts.
Teaching point 5: When the dividend is zero, the quotient is zero; when the dividend is equal to the divisor, the quotient is one; when the divisor is equal to one, the quotient is equal to the dividend.

</td>
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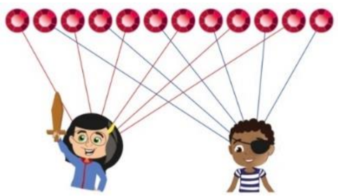
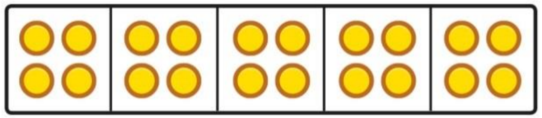
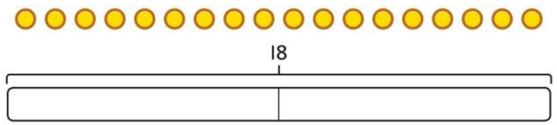
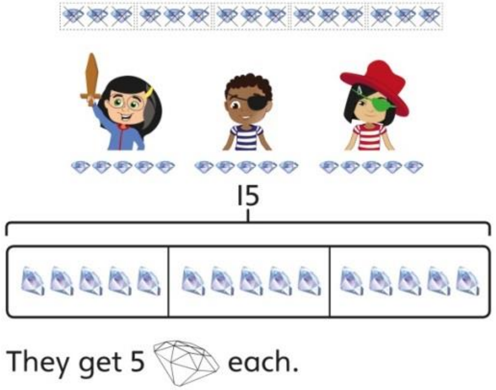
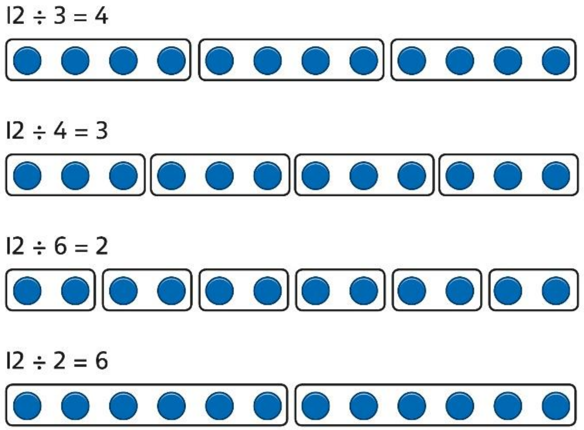
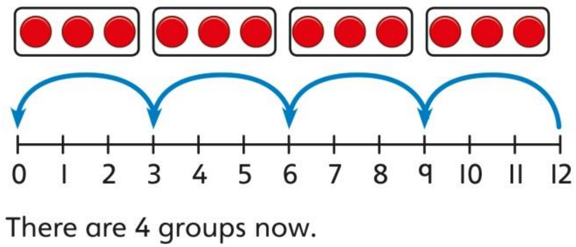
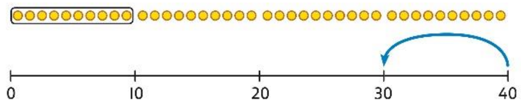
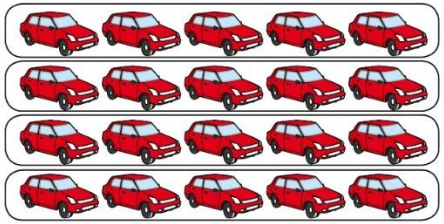
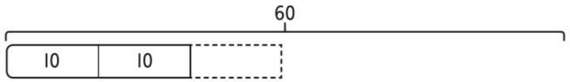
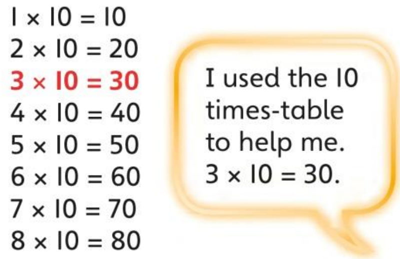
<tr>
<td>Sharing equally</td>
<td>Start with a whole and share into equal parts, one at a time.

12 shared equally between 2.
They get 6 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</td>
<td>Represent the objects shared into equal parts using a bar model.

20 shared into 5 equal parts.
There are 4 in each part.</td>
<td>Use a bar model to support understanding of the division.


18 ÷ 2 = 9</td>
</tr>
</table>

	 *15 shared equally between 3.* *They get 5 each.*		
Grouping equally	Understand how to make equal groups from a whole.  *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.	Link equal grouping with repeated subtraction and known times-table facts to support division. 	Relate times-table knowledge directly to division.

	 *4 groups of 5 cars is 20 cars in total.* *20 divided by 4 is 5.*	*40 divided by 4 is 10.* Use a bar model to support understanding of the link between times-table knowledge and 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*