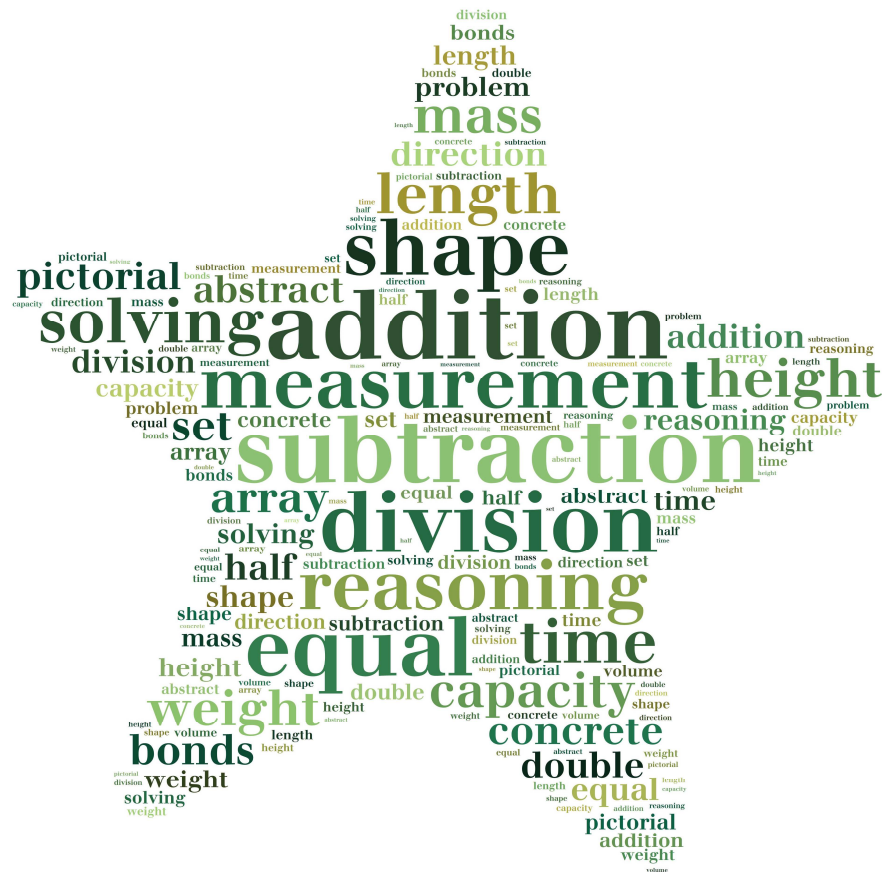
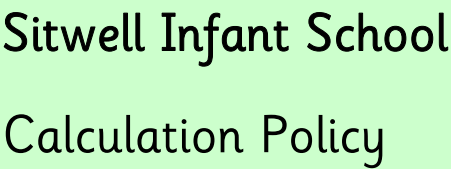
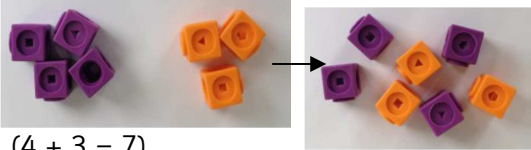
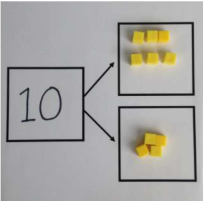
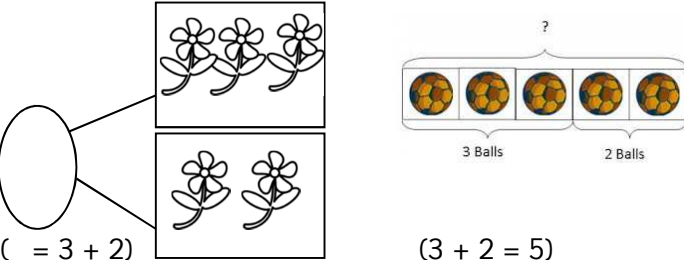
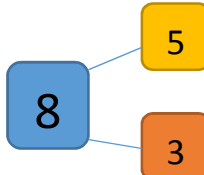
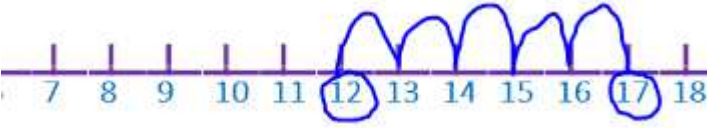
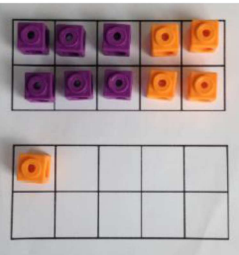
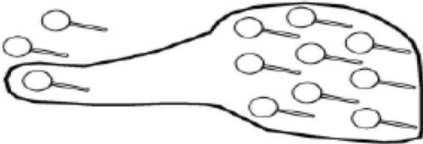
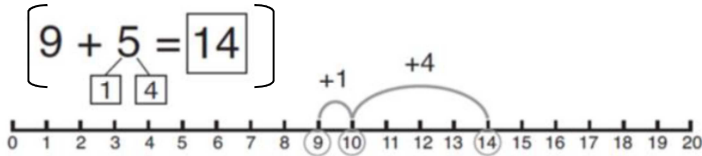
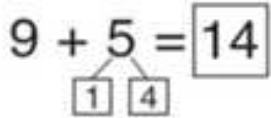




Addition

Objectives & Strategies	Concrete	Pictorial	Abstract
Combine two parts to make a whole: part-part-whole model. Introduced in FS2.	 $(4 + 3 = 7)$  $(10 = 6 + 4)$  $(8 + 1 = 9)$ Use concrete materials such as cubes to count out two numbers using objects. Count how many Use fingers by putting up both numbers and counting how many altogether.	 $(\quad = 3 + 2)$ $(3 + 2 = 5)$ Use pictures or diagrams to add two numbers together. Count how many altogether.  $(8 + 1 = 9)$ Draw representations and pictures to show addition and count to find the total	Use the part-part whole diagram as shown above to represent adding numbers using digits. Complete number sentences using + and = to represent adding two numbers together. $5 + 3 = 8$ 
Add a single digit and a two-digit number. (Start at the greatest number and count on) Introduced in FS2.	Start on the greatest number (12) on the bead string and separate the smaller number of beads (5) ready to count on. Count on the smaller number of beads (13, 14, 15, 16, 17) to find the total.  $(12 + 5 = 17)$	Start at the greatest number on the number line and count on five jumps in ones to find the answer.  $(12 + 5 = 17)$	Place the greatest number in your head and put up the smaller number on your fingers. Count on one more for each finger. The number you finish on is your answer. Record in a number sentence using + and =. $12 + 5 = 17$

The calculations in brackets show the calculation being completed in each stage. Children are expected to begin recording formally in their Maths books when they enter Year 1. In FS2 children practise their number formation and are introduced to ways to record their calculations.

	Start on the greatest number (6) and count on two more (7, 8) to find the total. $(6 + 2 = 8)$ 		
Regroup to make 10. Introduced in Year 1. N.B. This method is dependent on children being confident with number bonds to 10.	$(6 + 5 = 11)$  Start with the greatest number and use the smaller number to make the nearest 10. For example from 6 we need 4 more to make 10. Break up the 5 into a 4 and a 1. When you have made the 10 check how many are left (1). Find the total using place value	Use pictures to regroup or partition the smaller number to make 10. Either count on from the ten (10, 11, 12) or use place value knowledge to find the total (one 10 and two 1s is 12).  $(3 + 9 = 12)$ Use a number line to regroup or partition the smaller number to make 10. Draw a jump to total 10 and then a jump to represent the remaining value. 	$9 + 5 = 14$ From 9, how many more do I need to make 10? I know $9 + 1$ is 10. If I add 1 to 9, I will have 4 more left to add. I know $10 + 4 = 14$. Record in a number sentence using + and =. 

The calculations in brackets show the calculation being completed in each stage. Children are expected to begin recording formally in their Maths books when they enter Year 1. In FS2 children practise their number formation and are introduced to ways to record their calculations.

Add three single digits.

Introduced in Year 2.

$$(5 + 3 + 1 = 9)$$



Use concrete objects such as Numicon to represent the three numbers. Count how many altogether or start with the greatest number (5), count on the next number (3) and then the third (1). So count on three more from 5 (6, 7, 8) and then one more from 8 (9).

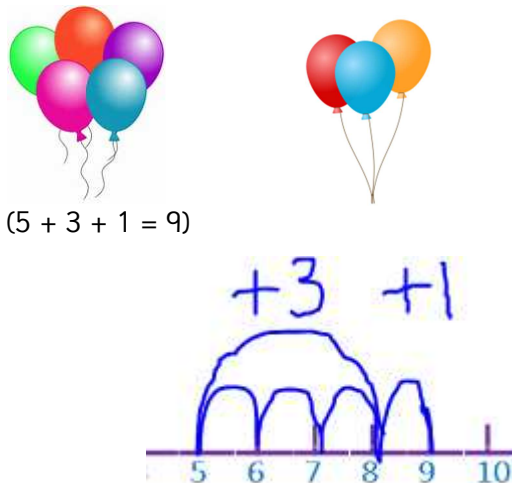


Where possible add two numbers to make 10 and add on the third number.

$$4 + 7 + 6 = 17$$

Put 4 and 6 together to make 10. Add on 7.

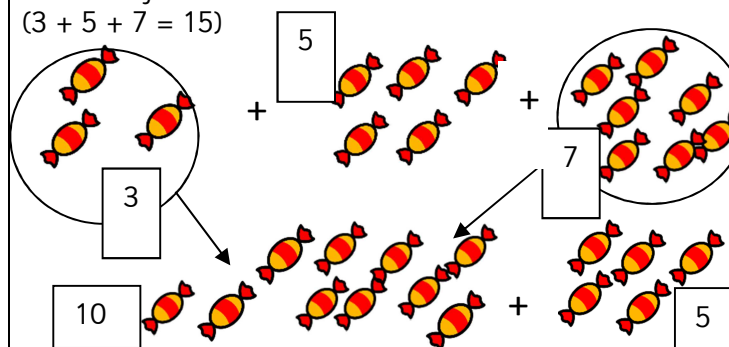
Use pictures or the number line to add three single digit numbers. Start with the greatest number (5), count on the next number of steps (3) and then the third (1). So count on three more from 5 (6, 7, 8) and then one more from 8 (9).



$$(5 + 3 + 1 = 9)$$

Use or draw pictures to represent each number. Regroup to make 10 where possible. If two of the numbers total 10, add them first and then add the third.

$$(3 + 5 + 7 = 15)$$

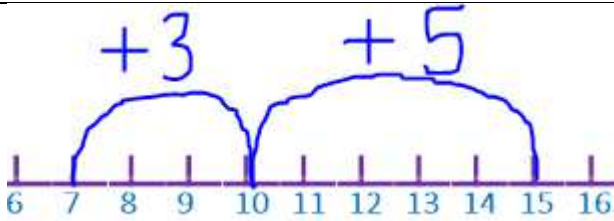
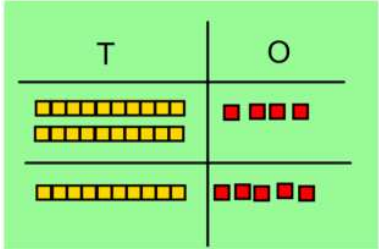
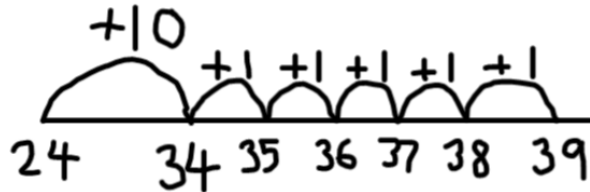
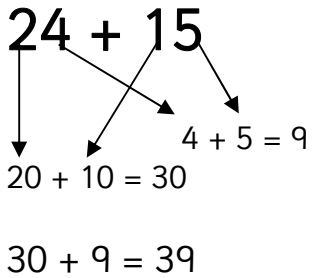
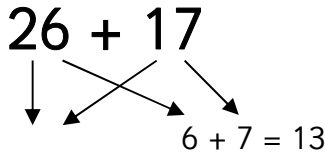


I know, $3 + 7 = 10$ and $10 + 5 = 15$, so $3 + 5 + 7 = 15$.

Mentally combine the two numbers that make 10 and then add on the third number using place value knowledge. Record in a number sentence using + and =.

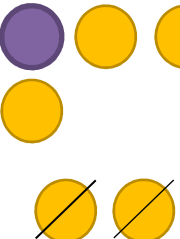
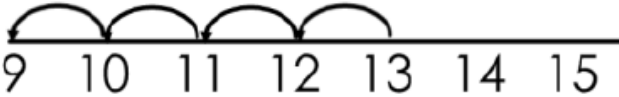
$$\begin{array}{r} \textcircled{4} + 7 + \textcircled{6} = \boxed{10} + \boxed{7} \\ 10 \\ = \boxed{17} \end{array}$$

The calculations in brackets show the calculation being completed in each stage. Children are expected to begin recording formally in their Maths books when they enter Year 1. In FS2 children practise their number formation and are introduced to ways to record their calculations.

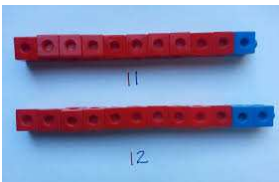
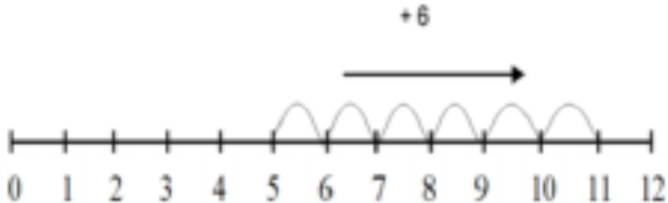
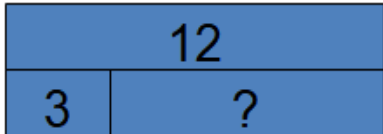
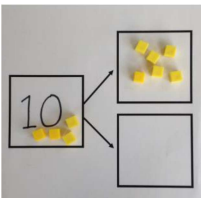
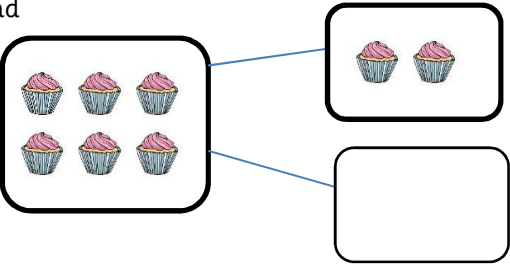
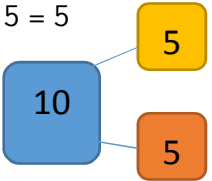
			
Add two two-digit numbers <i>Introduced in Year 2.</i>	Represent both numbers using concrete resources such as dienes and cubes. Count how many tens and ones altogether. (24 + 15 = 39) 	Draw representations of both two digit numbers and use them to count how many tens and ones altogether. (24 + 15 = 39) 11 :: + 1 :: Use an empty number line. Put the greatest number at the beginning. Add the tens first and then add the ones. (24 + 15 = 39) 	Mentally add the tens and ones and represent in a number sentence using + and =. 24 + 15 
Bridging 10s <i>Introduced in Year 2.</i>	Represent both numbers using concrete resources such as dienes and cubes. If there are more than 10 ones, use them to make another 10. There are 3 tens sticks and another 10 made of ones so 4 tens altogether. There are 3 ones left so 4 tens and 3 ones is 43.	Use an empty number line. Put the greatest number at the beginning. Add the tens first and then add the ones or the next step is to bridge the 10. This means after you have added the tens, partition the ones to add the ones you need to make the next multiple of 10. For example, here the 7 is partitioned into a 4 and a 3. Add 4 to 36 get to the next multiple of 10 (40) and then use place value knowledge to add the 3, 40 + 3 = 43.	Mentally add the tens and ones and represent in a number sentence using + and =. 26 + 17 

The calculations in brackets show the calculation being completed in each stage. Children are expected to begin recording formally in their Maths books when they enter Year 1. In FS2 children practise their number formation and are introduced to ways to record their calculations.

Subtraction

Objective and Strategies	Concrete	Pictorial	Abstract
Taking away ones Introduced in FS2.	Use concrete objects such as counters to subtract by taking away. Get 6 counters, take two away and count how many are left. 6 take away 2 equals 4.  $(6 - 2 = 4)$ Use fingers by putting up total and putting down the number being subtracted. Count the number of fingers left.	Cross out drawn objects to show what has been taken away. Draw 10 pictures and take away 9 by crossing out. Count how many are left. 10 take away 9 equals 1. $(10 - 9 = 1)$ 	Complete number sentences using - and = to represent adding two numbers together. Recall subtraction facts such as related number bond facts. $(10 - 3 = 7)$ $10 - 7 = 3)$
Counting back Introduced in FS2.	Make the greatest (first) number in the subtraction. Move the beads along the bead string as you count backwards in ones.  $(13 - 4 = 9)$ Start on 13 on the bead string and separate the number being subtracted (4) ready to count back. Count back in ones (12, 11, 10, 9) to find the quantity remaining.	Count back on a number line or number track $(13 - 4 = 9)$ Start on the greatest (first) number, 13 and count back 4 jumps. The number you land on is the answer. 	Count back mentally. For $13 - 4$, put 13 in your head and count back 4. Use fingers if needed. Record subtraction number sentences using - and =.

The calculations in brackets show the calculation being completed in each stage. Children are expected to begin recording formally in their Maths books when they enter Year 1. In FS2 children practise their number formation and are introduced to ways to record their calculations.

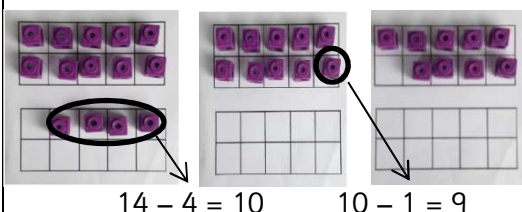
Find the difference Introduced in FS2.	Compare amounts and objects to find the difference.  Use cubes to build towers or make bars to find the difference. The difference between 11 and 12 is 1 so $12 - 11 = 1$.	Count on to find the difference as an alternative to counting back. For 11 subtract 5, start on 5 and find the difference to 11. Count the number of jumps in between 5 and 11 (6, 7, 8, 9, 10, 11). There are 6 jumps so the difference between 5 and 11 is 6, therefore 11 subtract 5 equals 6. ($11 - 5 = 6$)  Use the bar model to find the difference between two numbers. How many <u>more than</u> 3 is 12? 	Find the difference by counting forwards mentally. For $13 - 11$, put 11 in your head and count forwards to find how many ones you need to reach 13 (12, 13). 2 more than 11 is 13 so $13 - 11 = 2$. Record subtraction number sentences using $-$ and $=$.
Part Part Whole Model Introduced in FS2.	Understand the commutative nature of addition and subtraction using the part-part-whole model.  If 10 is the whole and 6 is one of the parts, what is the other part? I know $6 + 4 = 10$ so $10 - 6 = 4$.	Use a pictorial representation of objects to work out subtractions using the part-part-whole model. If 6 is the whole and one part is 2, what is the other part? I know $2 + 4 = 6$ so $6 - 2 = 4$. 	Use the part-part-whole model with digits and work out the answers using mental recall. Record in subtraction number sentences using $-$ and $=$. $10 - 5 = 5$ 

The calculations in brackets show the calculation being completed in each stage. Children are expected to begin recording formally in their Maths books when they enter Year 1. In FS2 children practise their number formation and are introduced to ways to record their calculations.

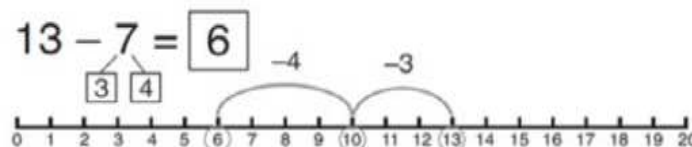
Regroup to bridge 10

Introduced in Year 1.
N.B. This method is dependent on children being confident with number bonds to 10.

Use concrete objects such as tens frames and cubes to subtract more quickly by bridging 10. Make 14 on the ten frame. Partition the 5 into 4 and 1. Take away 4 first to leave 10 and then take away 1 more so you have taken away 5 altogether. You are left with the answer of 9. ($14 - 5 = 9$)



Use a number line to subtract by counting back bridging 10. Start at 13. Partition the 7 into 3 and 4. Take away 3 first to reach 10. Then take away the remaining 4 so you have taken away 7 altogether. You are left with the answer 6.



Work out subtractions by mentally bridging 10.

$$15 - 7 = 8$$

From 15 I know $15 - 5 = 10$, so I need to partition 7 into 5 and 2.

$$15 - 7 = 15 - 5 - 2$$

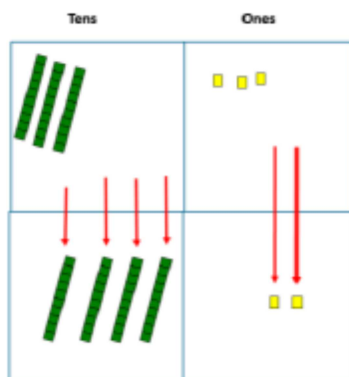
I know $15 - 5 = 10$ and $10 - 2 = 8$ so the answer must be 8.

Record in a number sentence using - and =.

Subtract a two digit number from a two digit number

Introduced in Year 2.

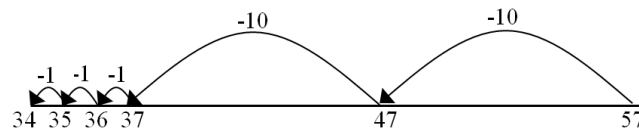
Use concrete resources to represent the greatest (first) number. Take the smaller number away. ($75 - 42 = 33$)
75 is equal to 7 tens and 5 ones. To subtract 42, take away 4 tens and 2 ones. Count how many tens and ones are left. There are 3 tens and 3 ones left so the answer is 33.



Use an empty numberline.

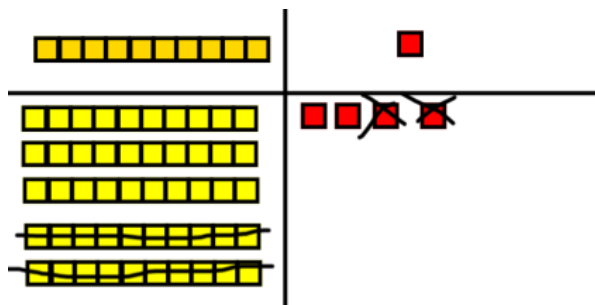
$$(57 - 23 = 34)$$

Put the greatest (first) number at the right end of the line. Subtract 23 by subtracting the 2 tens first and then the three ones.



Draw the dienes and cubes or place value counters alongside the written calculation to help to show working out.

$$(54 - 22 = 32)$$



$$29 + 15$$

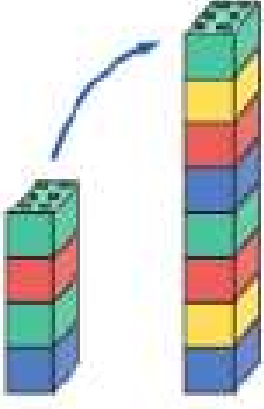
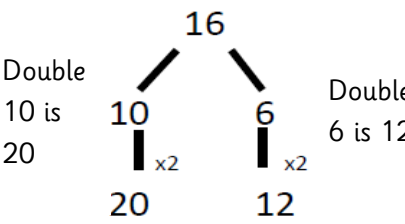
$$\begin{array}{r} 29 \\ + 15 \\ \hline 20 - 10 = 10 \end{array}$$

$$10 + 4 = 14$$

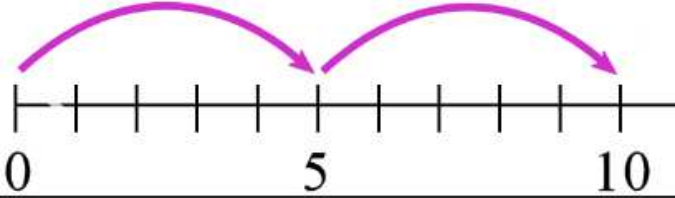
Mentally subtract the tens and ones and represent in a number sentence using - and =.

The calculations in brackets show the calculation being completed in each stage. Children are expected to begin recording formally in their Maths books when they enter Year 1. In FS2 children practise their number formation and are introduced to ways to record their calculations.

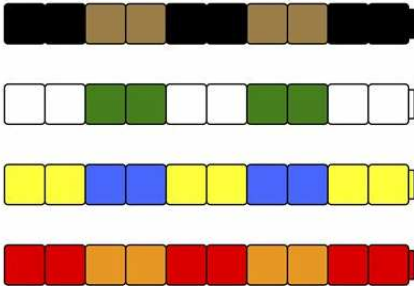
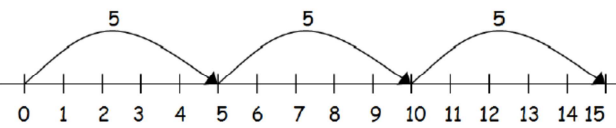
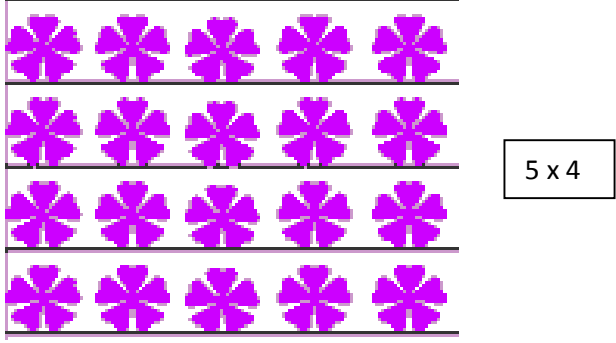
Multiplication

Objectives & Strategies	Concrete	Pictorial	Abstract
Doubling Introduced in FS2	Use concrete materials such as cubes to practise doubling quantities.  double 4 is 8 $(4 \times 2 = 8)$	Interpret and draw pictures to represent doubling a number.  $(4 \times 2 = 8)$	Learn doubles as mental recall facts. 'double 1 is 2, double 2 is 4 etc' Record using + or x and =. $4 + 4 = 8$ $4 \times 2 = 8$ (four two times equals eight) For greater numbers, partition and then double each part mentally before recombining it back together.  $20 + 12 = 32$ So double 16 = 32

The calculations in brackets show the calculation being completed in each stage. Children are expected to begin recording formally in their Maths books when they enter Year 1. In FS2 children practise their number formation and are introduced to ways to record their calculations.

Counting in multiples Introduced in Year 1 (2s, 5s, 10s) Introduced in Year 2 (3s, 10s from any number)	Count in multiples using concrete objects in equal groups. Make groups of five beads on the string. Count in 5s to find the total. There are four groups - 5...10...15...20 so the total is 20.  Make groups of two cubes. Count in twos to find the total. There are four groups - 2.. 4..6..8 so the total is 8. 	Use a number line or pictures to support counting in multiples. There are six hands with five fingers. Count in 5s to find the total - 5..10...15...20...25...30 so the total is 30.  Use the number line to jump in steps of five by starting on zero and jumping forwards 5. 	Count in multiples of a number aloud using mental recall. Write sequences counting in multiples of numbers. 2, 4, 6, 8, 10 5, 10, 15, 20, 25, 30 Fill in missing numbers in sequences counting in multiples of numbers. 3, 6, __, 12 35, __, 25, 20
Repeated addition Introduced in Year 1	Use concrete objects to add a group repeatedly. Add three 5 pieces of Numicon. Add the 5s to find the total (either by counting all or counting on in 5s).  (5 + 5 + 5 = 15) (5, 10, 15) Add four blocks of 10 cubes (either by counting all or counting on in 10s).	Use pictures to represent groups of the same quantity. There are 4 groups of 2 hearts. Add 2s to find the total. $2 + 2 + 2 + 2 = 8$ ($2 \times 4 = 8$)  Use a number line to add three 5s. Jump three steps of 5 and add them together to find the total.	Write repeated addition sentences using + and = to represent adding a number/quantity repeatedly. $3 + 3 + 3 = 9$

The calculations in brackets show the calculation being completed in each stage. Children are expected to begin recording formally in their Maths books when they enter Year 1. In FS2 children practise their number formation and are introduced to ways to record their calculations.

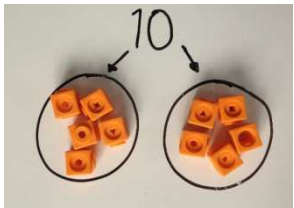
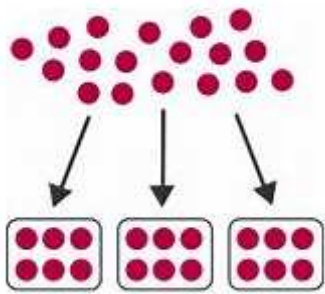
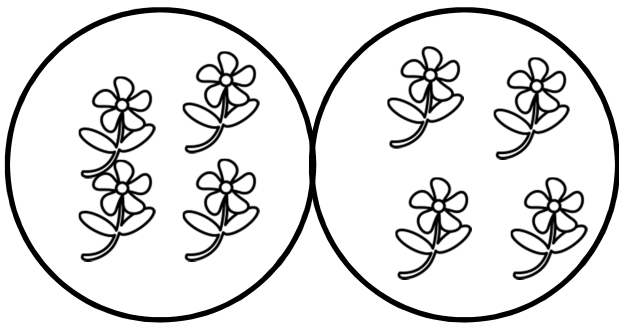
	 (10 + 10 + 10 + 10 = 40) (10, 20, 30, 40)	 5 add 5 add 5 equals 15	 2 + 2 + 2 + 2 + 2 = 10
Arrays Introduced in Year 1	Create arrays using concrete materials such as counters/ cubes to show a group of a given quantity repeated. Here 6 x 4 (six four times) is being represented by putting six counters in a row and repeating it four times. It also represents 4 x 6 (four six times). This demonstrates the commutative property of multiplication. 	Draw and use pictures of arrays in different rotations to find commutative multiplication sentences. This array shows 5 in a row multiplied by 4 (five four times or 5 x 4). Count in 5s to find the total – 5, 10, 15, 20.  The same array can show 4 in a row multiplied by 5 (four five times or 4 x 5). Count in 4s to find the total – 4, 8, 12, 16, 20. It is important that children understand that multiplication is commutative. For example, 5 x 4 and 4 x 5 are equal to each other and have the same	Learn multiplication facts as mental recall. Write multiplication number sentences using x and =. 5 x 4 = 20 group how many times the group is multiplied

The calculations in brackets show the calculation being completed in each stage. Children are expected to begin recording formally in their Maths books when they enter Year 1. In FS2 children practise their number formation and are introduced to ways to record their calculations.

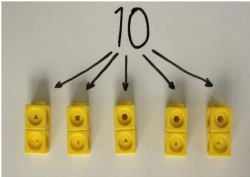
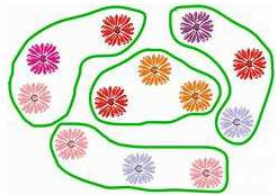
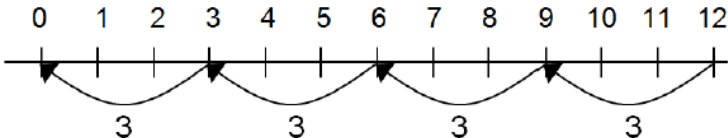
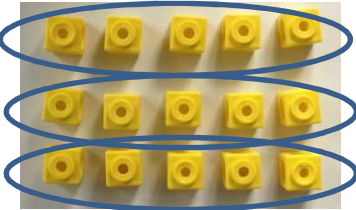
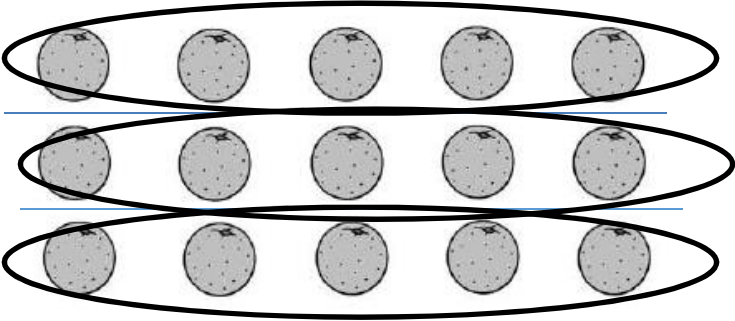
		total.  5 x 4	
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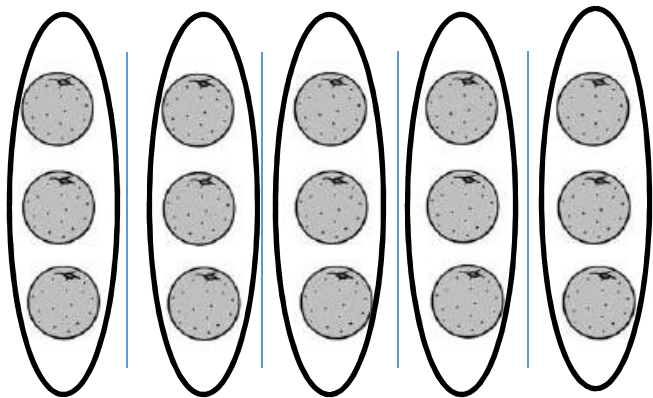
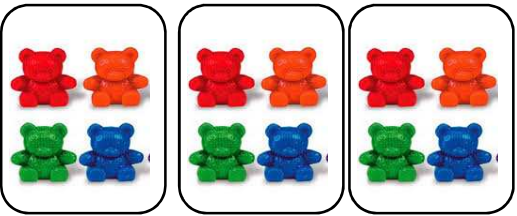
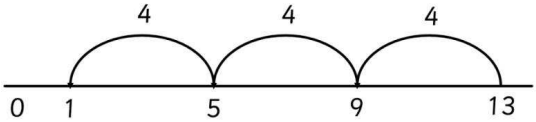
Division

Objectives & Strategies	Concrete	Pictorial	Abstract
Sharing objects into groups Introduced in FS2.	Divide objects by sharing them into equal groups. Count out the correct quantity. Put one in each group until there are none left.  10 shared into two equal groups is 5. ($10 \div 2 = 5$)  18 counters shared into three equal groups is 6. ($18 \div 3 = 6$)	Children use pictures or shapes to share quantities into equal groups. ($8 \div 2 = 4$) 	Work out sharing questions mentally. 'If I share 6 buns between three people, how many will they get each?' 'If the 6 buns are shared equally, the three people will get 2 buns each.' Record in a number sentence using $\div$ and $=$.

The calculations in brackets show the calculation being completed in each stage. Children are expected to begin recording formally in their Maths books when they enter Year 1. In FS2 children practise their number formation and are introduced to ways to record their calculations.

Division as grouping Introduced in FS2.	Divide objects into groups of a given quantity. Use cubes, counters, objects or place value counters to aid understanding. Divide 10 by 2. If 10 cubes are split into groups of 2, 5 groups can be made. ($10 \div 2 = 5$) 	Use pictures to make equal groups of a given quantity and then count how many groups can be made. 12 flowers are put into bunches of 3 flowers. How many bunches can be made? 4 bunches ($12 \div 3 = 4$)  Use a number line. Find the number being divided. Use jumps to show how many steps of a given group can be made between the total and 0.  12 divided into groups of 3 is 4 (from 12, 4 jumps of 3 can be made to 0). ($12 \div 3 = 4$)	Divide numbers into groups mentally using mental recall and partitioning. Record using $\div$ and $=$. $12 \div 3 = 4$ $28 \div 2 = 14$ $\downarrow \quad \searrow$ $8 \div 2 = 4$ $20 \div 2 = 10 \quad 10 + 4 = 14$ Partition 28 into tens and ones (20 and 8). Divide 20 by 2 and 8 by 2 and add the answers to find the final answer. Understand that multiplication is the inverse of division and use this to support. What is $18 \div 9$? I know that $9 \times 2 = 18$ so $18 \div 9 = 2$.
Division using arrays Introduced in Year 1.	Link division to multiplication by creating an array.  Find 15 divided by 5. Get 15 cubes. Put them in rows of 5. The number of rows is the number of groups of 5 which can be made. 15 divided by 5 is 3. ($15 \div 5 = 3$)	 Use a pictorial array and split the array into equal groups. 15 split into groups of 5 is 3. ($15 \div 5 = 3$)	As above.

The calculations in brackets show the calculation being completed in each stage. Children are expected to begin recording formally in their Maths books when they enter Year 1. In FS2 children practise their number formation and are introduced to ways to record their calculations.

		 Use a pictorial array to understand related division facts. If 15 split into groups of 5 is 3, 15 split into groups of 3 is 5. $(15 \div 3 = 5)$	
Division with a remainder Introduced in Year 2 for achieving Greater Depth.	Divide 14 objects into groups of 4 and see how many are left.   14 divided into groups of 4 is 3 remainder 2. ($14 \div 4 = 3 \text{ r}2$)	Use a number line. Find the number being divided. Use jumps to show how many steps of a given group can be made between the total and 0. When another group cannot be made, the quantity left is the remainder. 13 divided into groups of 4 is 3 with a remainder of 1 (from 13, 3 jumps of 4 can be made to 1 and there is a remainder of 1 to reach 0). $13 \div 4 = 3 \text{ r } 1$  Draw dots and group them to divide an amount and clearly show a remainder. ($14 \div 3 = 4 \text{ r}2$) 	Complete division number sentences and show the remainder using $\div$ and r for remainder.

The calculations in brackets show the calculation being completed in each stage. Children are expected to begin recording formally in their Maths books when they enter Year 1. In FS2 children practise their number formation and are introduced to ways to record their calculations.