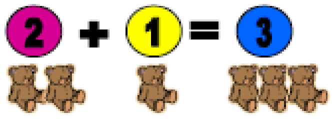
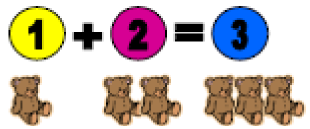
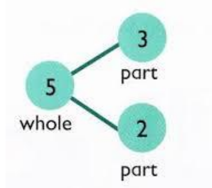
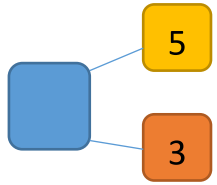
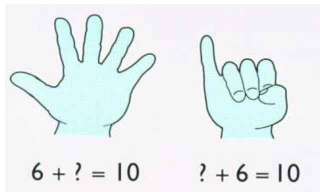
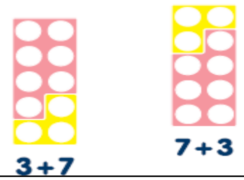
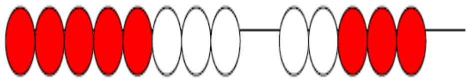
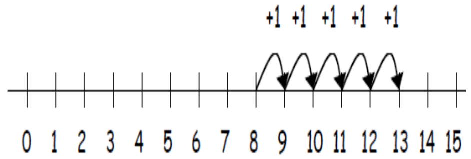
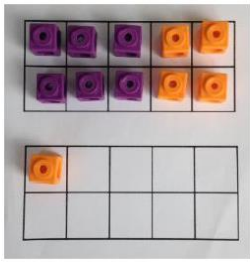
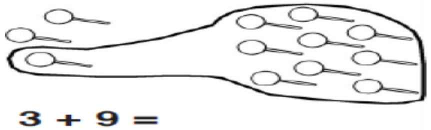
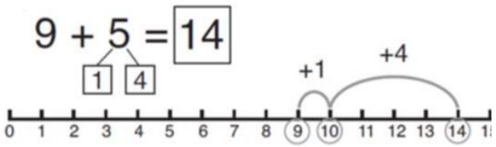
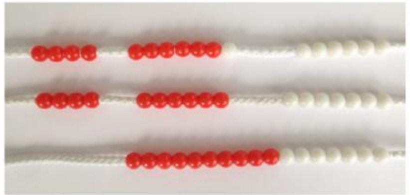
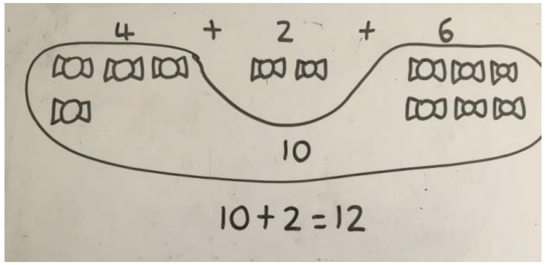
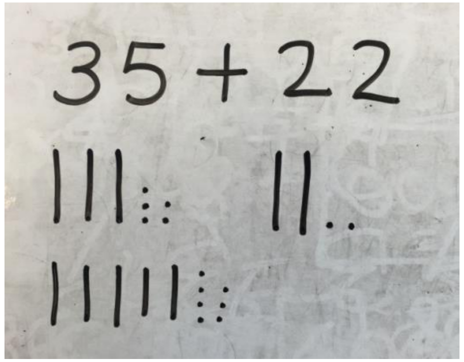
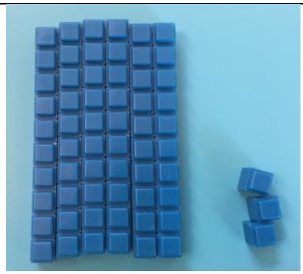
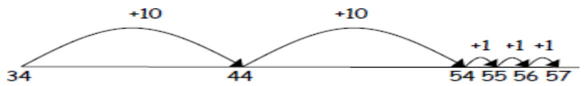
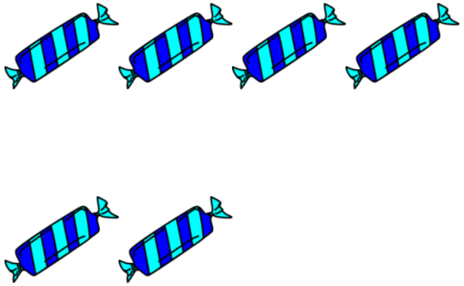
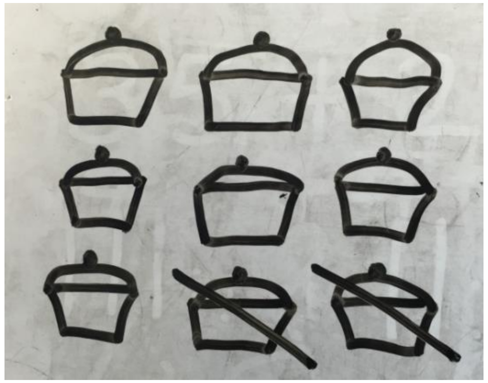
RSS Progression in Calculation

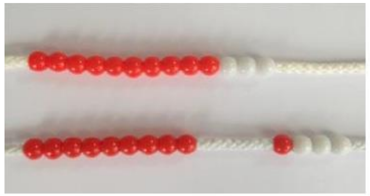
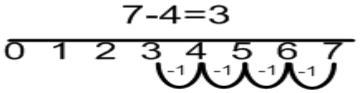
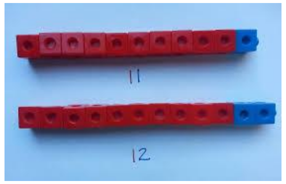
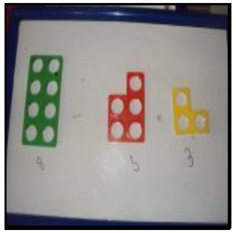
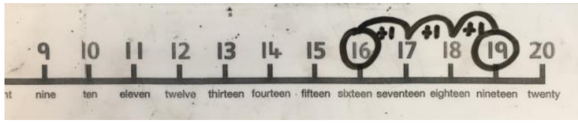
Addition			
Strategies	Concrete	Pictorial	Abstract
• Count groups of objects • Count forwards and backwards to 10 • Count forwards and backwards to 20 • Understand how to make all numbers up to 10 • Know 1 more than any number to 10.	 Use objects and count all to find the total.    Use cubes to add two numbers together as a group or in a bar.  Use cubes or objects to add 2 numbers together to find the whole.	Line up objects along a number track.  Use number tracks to find 'one more than'.  Break a number up into part-part-whole. Draw jottings to represent the numbers. 	I know that 1 more than 5 is 6. $4 + 3 = 7$ $10 = 6 + 4$  If one part is 5 and the other part is 3. What is the whole number? Use the part-part whole diagram as shown above to move into the abstract. 

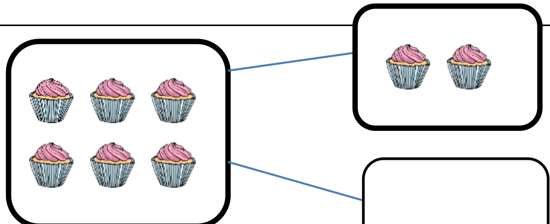
			
• Start at the biggest number and count on to add • Know addition and subtraction facts for all numbers to 10. • Add one digit and two-digit numbers to 20, including zero.	 Start with the larger number on the bead string and then count on to the smaller number 1 by 1 to find the answer.	 8+5=13 Start at the larger number on the number line and count on in ones or in one jump to find the answer.	5 + 8 =13 I put 8 in my head and count five more, 9, 10, 11, 12, 13. Place the larger number in your head and count on the smaller number to find your answer.
• Regroup to make 10 • Know all addition and subtraction facts for all numbers to 20. • Show that addition of two numbers can be done in any order (commutative)	9+3=12  6 + 5 =11  Start with the larger number and use the smaller number to make 10.	Use pictures or a number line. Regroup or partition the smaller number to make 10.  	7 + 4 = 11 If I am at 7, how many more do I need to make 10. How many more do I need to add on now?

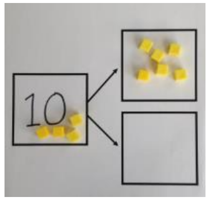
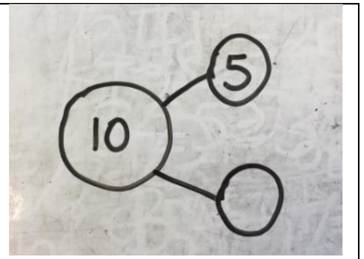
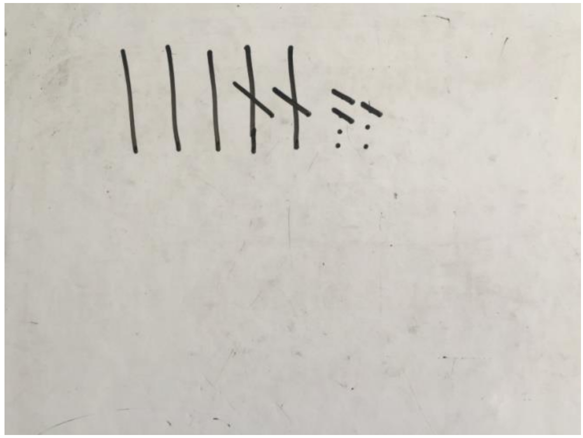
• Add three 1-digit numbers	Following on from making 10, make 10 with 2 of the digits (if possible) then add on the third digit.  4+7+6=17 Put 4 and 6 together to make 10. Add on 7	Add together three groups of objects. Draw a picture to recombine the groups of 10. 	$\underbrace{4+7+6}_{10} = \boxed{10}+\boxed{7}$ $= \boxed{17}$ Combine the two numbers that make 10 and then add on the third number.
• Add two 2-digit numbers • Use addition facts to 20 fluently and derive and use related facts up to 100. • Add any two 2-digit numbers by counting on in 10s and 1s or by using partitioning • Solve addition problems in the context of measures, coins	Partition the number and recombine 42+21  40 + 2 + 20 + 1 Add the tens together and the ones together	After practically using base 10, numicon and coins, children can draw jottings to help them to solve addition.  Use an empty numberline. Start from the largest number and then count on in tens and ones to add the smaller number.	42+21= 40+20= 60 2+1= 3 60+3=63 So 42+21=63

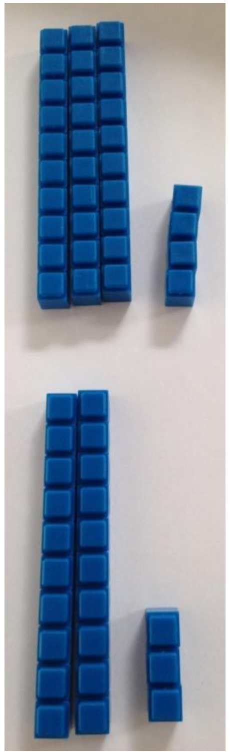
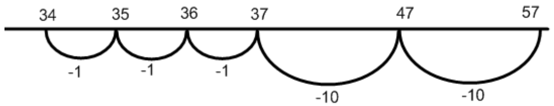
	 = 63 Or use coins to partition into tens and ones  Add the tens together and the ones together 	34+23=57 	

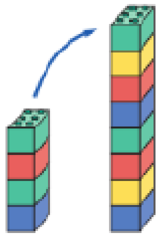
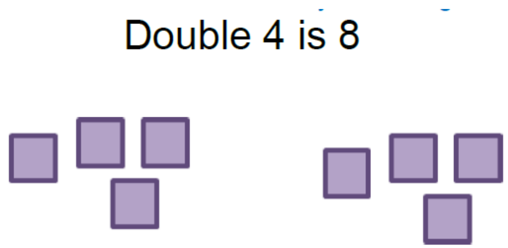
Subtraction			
Strategies	Concrete	Pictorial	Abstract
• Taking away ones • Know 1 less than any number up to 10	Use physical objects, counters, cubes etc. To show how objects can be taken away.  John has 6 sweets. He eats 2. How many are left? 6-2=4 	Line up objects along a number track and remove  Use number tracks to find 'one less than'. Draw jottings to represent the numbers. Cross out the number to be taken away.  I have 9 cakes. I eat 2. How many are left? 9-2=7	I know 1 less than 5 is 4. 8 -2 =6 10 – ☐ = 9 10 – 5 =
• Subtract one digit numbers by counting	Count back on a bead string or as you remove objects	Count back on a number line or number track	13 – 4 Put 13 in your head and count back 4. What

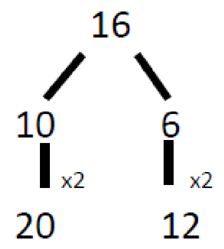
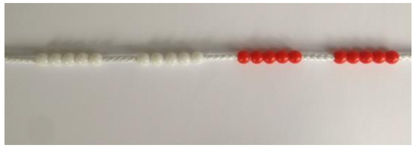
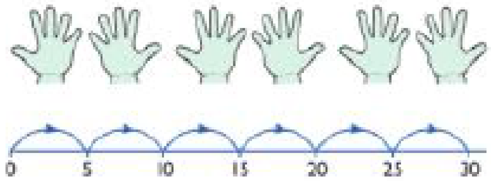
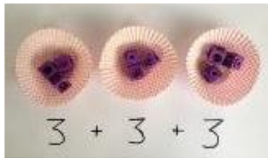
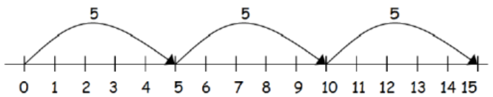
backwards, **including zero.** • Solve one step problems that involve subtraction including missing number problems. • Know that subtraction cannot be done in any order. • Solve subtraction problems in the context of measures, coins	Make the larger number in your subtraction. Move the beads along a bead string as you count backwards in ones. 13 – 4  Use counters or other objects and move them away from the group as you take them away, count backwards as you do it. 	 Start at the biggest number and count back the smaller number, showing the jumps on the number line.	number are you at? Use your fingers to help.
• Understand when it is appropriate to find the difference.	Compare amounts and objects to find the difference. Say how many more and how many less.   8 - 5 = 3 The difference between 8 and 5 is 3	Count on to find the difference between two numbers that are close together. 19 – 16. It would take a long time to count back 16 so it is quicker to count forwards and find the difference.  I start on 16 and count on to 19. The difference is 3	Jayne has 23 sweets. Julia has 15 sweets. How many more sweets does Jayne have?
• Use part-part-whole model to show the	Link to addition- use the part whole model to explain the inverse between addition and	Use a pictorial representation of objects to show the part part whole model.	Use numbers in the part-part- whole model

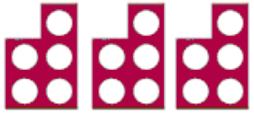
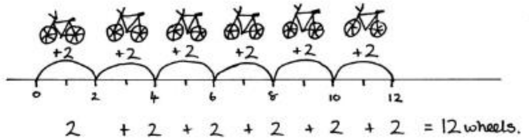
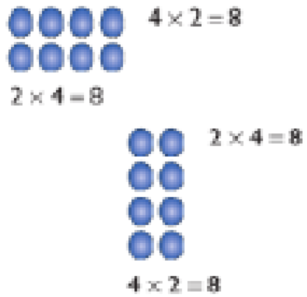


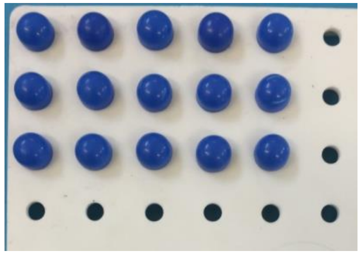
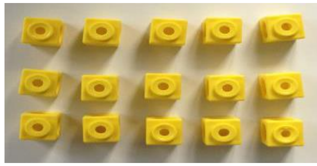
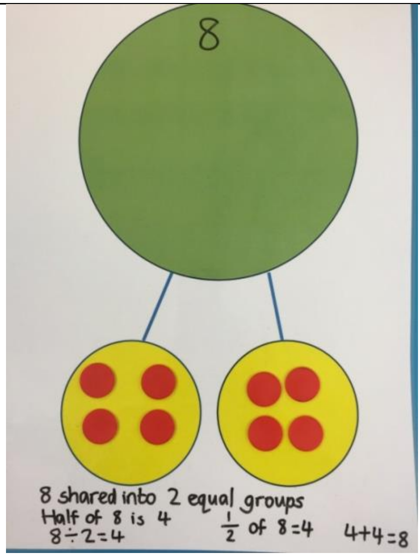
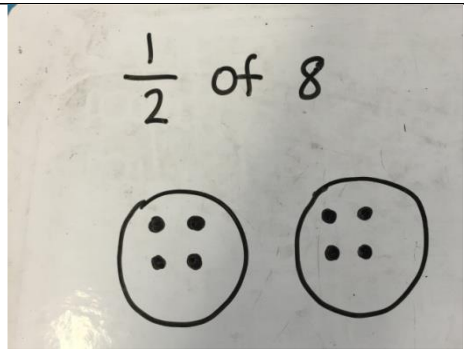
relationship between addition and subtraction. • Recognise and use the **inverse** relationship between addition and subtraction and use this to check calculations and missing number problems.	 If 10 is the whole and 6 is one of the parts. What is the other part? 10 – 6 =	6 – 2 = If 6 is the whole and one part is 2. What is the other part?	 $10 - \boxed{} = 5$
• Subtract a 2-digit number from another 2-digit number • Subtract by counting back on a number line, counting back in tens and ones. • Subtract by partitioning the number into tens and ones.	Use base 10 to make the bigger number and then take the smaller number away. 57- 23 	Draw jottings to represent base 10. 	57-23 57-20=37 37-3=34

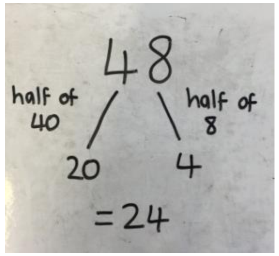
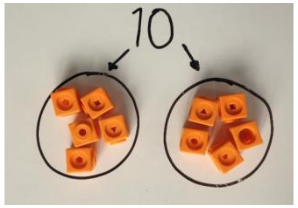
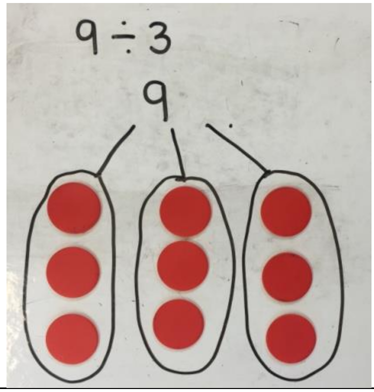
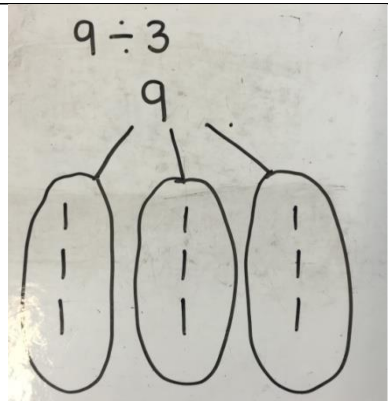
	Remove 23  There are 34 left. So 57-23 = 34 Use coins 57-23  Partition the second number and take away the tens and ones. How many are left?	Start at the bigger number and count back the smaller number showing the jumps on the number line. Take away the tens and then the ones.  	

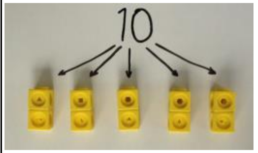
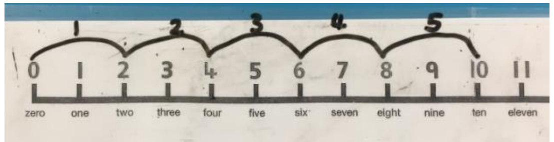
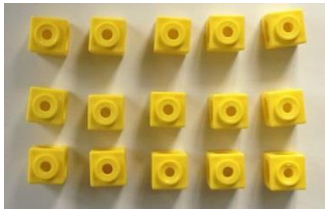
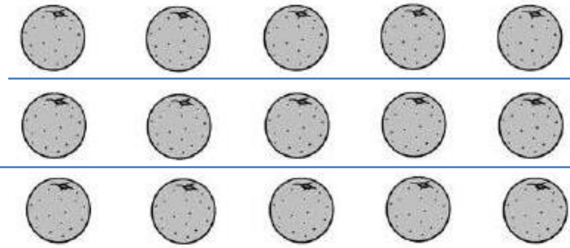
			
Multiplication			
Strategies	Concrete	Pictorial	Abstract
• Doubling	Use practical activities to show how to double a number   	Draw pictures to show how to double a number  	I know double 4 is 8 because 4 + 4 is 8. Partition larger numbers and double the tens and then the ones

	5+5=10 4+4=8		 So double 16 is 32.
• Counting in multiples • Count in steps of 2, 3, 5 and 10 • Recall the 2, 5 and 10 times tables.	Count in multiples supported by concrete objects in equal groups.  	Use a number line or pictures to continue support in counting in multiples. 	Count in multiples of a number aloud. Write sequences with multiples of numbers. 2, 4, 6, 8, 10 5, 10, 15, 20, 25 , 30 Know the 2, 5 and 10 times tables.
• Multiplication is taught as repeated addition.	Use different objects to add equal groups. 	There are 3 plates. Each plate has 2 star biscuits on. How many biscuits are there?  2 add 2 add 2 equals 6  5+5+5=15	I have 5 pairs of socks, how many socks are there altogether? How many wheels are there on 3 bikes? *If I save 10p each week for 5 weeks, how much money do I have?*

	 2+2+2+2+2=10 2x5=10  5+5+5=15 5x3=15	 6 x 2 = 12 2 taken 6 times 6 groups of 2 = 12 2 multiplied by 6 = 12	
• Arrays • Recognise and use the **inverse** relationship between multiplication and division in calculations. • **Show that multiplication of two numbers can be done in any order (commutative)**	Create arrays using counters/ cubes/ peg boards to show multiplication  5x4=20 5 taken 4 times is 20 5+5+5+5=20 4x5=20 4 taken 5 times is 20 4+4+4+4+4=20	Draw arrays in different rotations to find **commutative** multiplication sentences.  	Use an array to write multiplication sentences and reinforce repeated addition.  5+5+5=15 3+3+3+3+3=15 5x3=15 3x5=15

	 3x5=15 3 taken 5 times is 15. 5x3=15 5 taken 3 times is 15. 		
Division			
Strategies	Concrete	Pictorial	Abstract
• Find half by sharing objects into 2 equal groups • Recognise odd numbers as numbers which cannot be shared into 2 equal groups. • Recognise even numbers as numbers which can be shared into 2 equal groups.	 Use counters and objects to share into 2 equal groups.	 Children can find half by drawing 2 groups and sharing the number equally.	Know half of even numbers. I know half of 12 is 6 because 6+6=12. Find half of a larger number by partitioning into tens and ones and finding half of the tens and half of the ones.

			
• Sharing objects into equal groups • Recognise that division is not commutative and cannot be done in any order.	Share objects by putting 1 object in each group, then 2 objects in each group, until they are shared equally.  10 shared into 2 equal groups, makes 5 in each group.  9 shared into 3 equal groups, makes 3 in each group.		Share 9 sweets between 3 people. 9÷3=

• Division as grouping	Divide quantities into equal groups. Use cubes, counters, objects or place value counters to aid understanding. 10 ÷ 2=  How many groups of 2 are there in 10?	Use a number line to show jumps in groups. The number of jumps equals the number of groups.  	A teacher needs 30 apples. There are 5 apples in each bag. How many bags of apples will she need? 30÷5=
• Division within arrays • Recognise and use the **inverse** relationship between multiplication and division in calculations.	Link division to multiplication by creating an array and thinking about the number sentences that can be created.  15÷3=5 15÷5=3 3x5=15 5x3=15	 Draw an array and use lines to split the array into groups to make multiplication and division sentences.	Find the inverse of multiplication and division sentences by creating four linking number sentences. 4x5=20 5x4=20 20÷5=4 20÷4=5