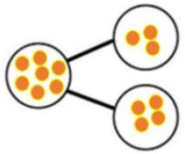
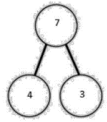
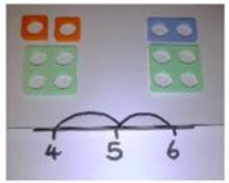
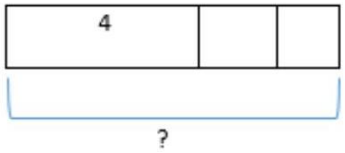
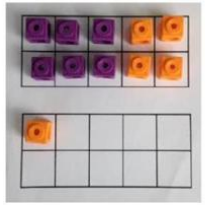
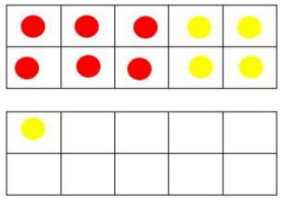
Ashfield Infant and Nursery School

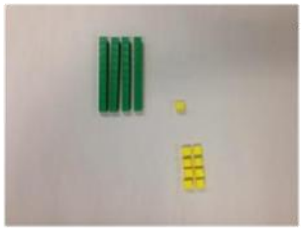
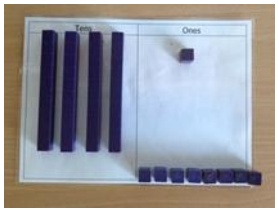
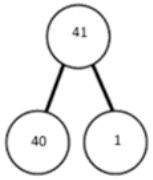
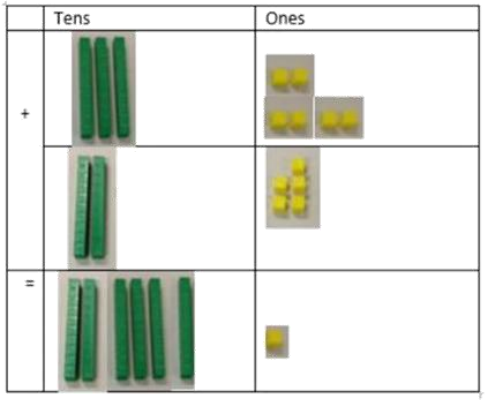
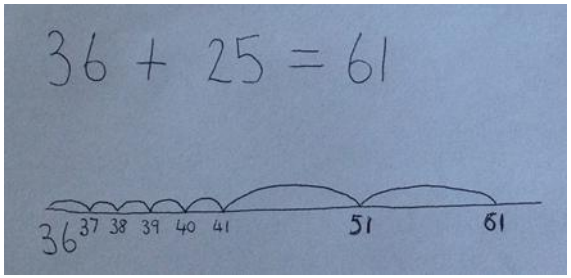
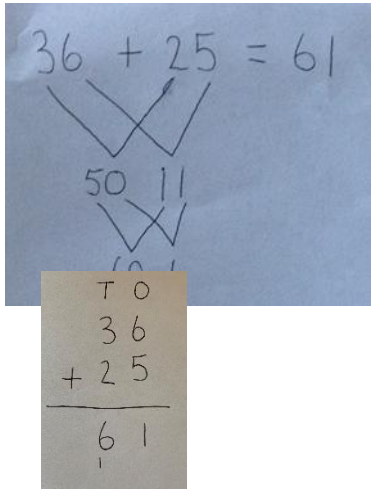
Maths Calculation Policy

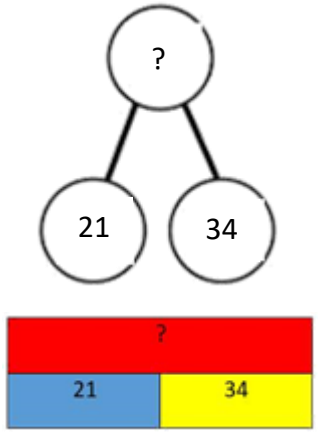
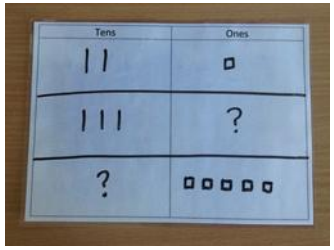
Updated November 2022

Addition-

Key language which should be used: sum, total, parts and wholes, plus, add, altogether, more than, 'is equal to' 'is the same as'

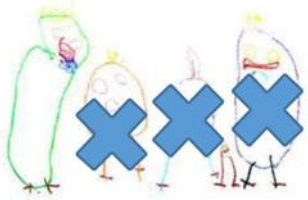
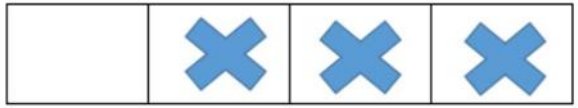
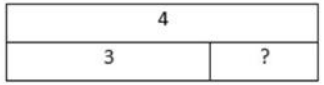
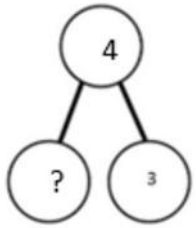
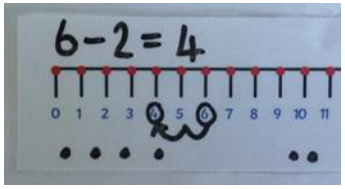
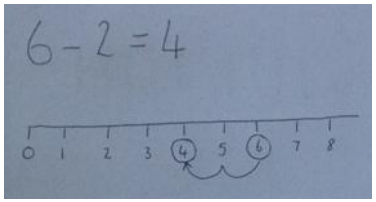
Concrete	Pictorial	Abstract
Combining 2 parts to make a whole use other resources as well e.g. teddy bears, counters etc  	**Children to draw objects into part whole model and understand that combining together will give you the total** 	Children will understand that with addition the answer will be bigger as we are combining numbers and can **mentally count on/forwards:** **4 + 3 = 7** 4 is a part, 3 is a part and the whole is 7 
Counting on using number lines by using cubes or numicon  	A **bar model** which encourages the children to count on. 	**The abstract number line**: What is 2 more than 4? What is the sum of 2 and 4? What is the total of 4 and 2? (4+2) 
Regrouping to make 10 by using tens frames and counters/cubes/numicon e.g. 6+5  	Children to draw the **tens frame** and the counters/cubes 	**Children to develop and understanding of equality** e.g. if 6+5 = 11 then 6+5=5+ ? 6+5=? +4

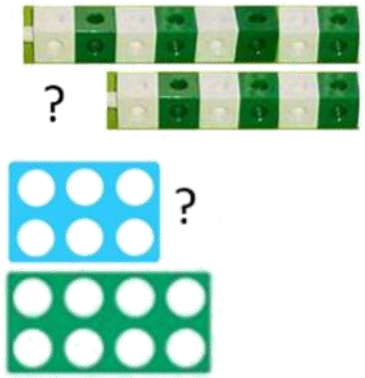
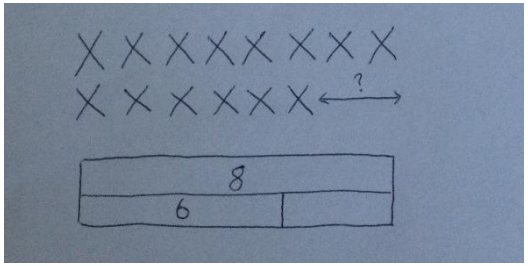
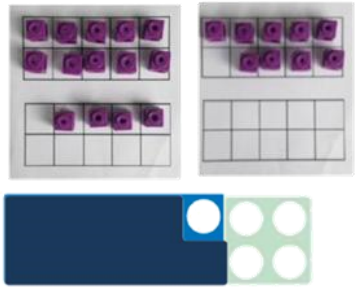
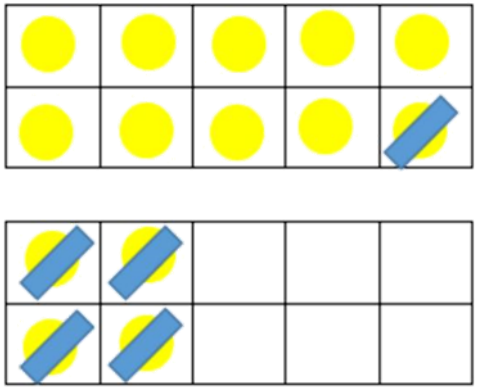
Tens and Ones + Ones using base 10 to continue to develop understanding of partitioning and place value e.g. 41+8 	Children to represent the concrete by drawing their objects e.g. lines for tens and dots for ones 41+8 	Children to understand that adding ones can be calculated mentally and then combined with the tens. Examples of possible methods include – counting on in head, recording as column method adding ones then tens 41+8 1+8=9 40+9=49 41 + 8 
Tens and Ones + Tens and Ones Continue to develop understanding of partitioning and place value by using place vale charts to support addition. Begin with no exchanging. e.g. 36+25= 	This can be done by drawing a **number line**: Ensure that the jumps are above the number line and that the ones are added first then the tens to support column method. 	Addition by **partitioning** or column method: 

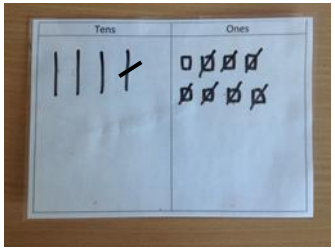
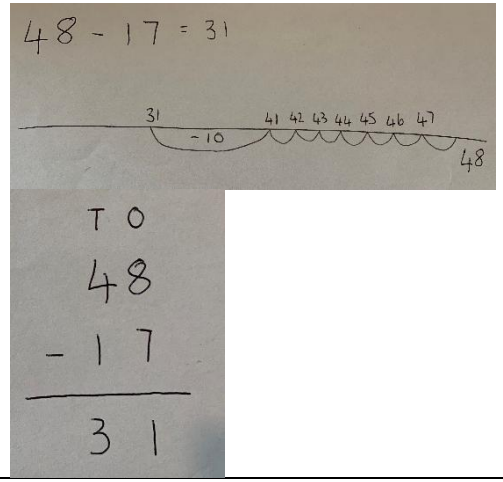
Fluency variation, different ways to ask children to solve addition problems as indicated by White Rose Maths: e.g. 21+34			
	Sam saved £21 one week and £34 another. How much did he save in total? 21+34=55 Prove it by reasoning understanding of adding ones and tens and combining.	21 +34 ____ 21+ 34 = ? = 21+34 What is the sum of twenty one and thirty four?	Missing digit problems: 

Subtraction-

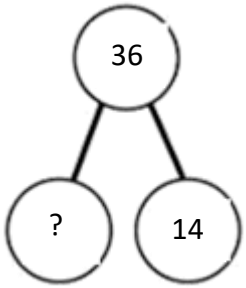
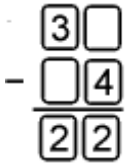
Key language which should be used: take away, less than, the difference, subtract, minus, fewer, decrease, '7 take away 3, the difference is four'

Concrete	Pictorial	Abstract
Physically taking away and removing objects from a whole (use various objects) 4 – 3 = 1 	**Children will draw the concrete resources they are crossing out** e.g. counters, base 10, numicon  	Children will understand that with subtraction the answer will be smaller and can **mentally count backwards** 4-3=? ?=4-3  
Counting backwards e.g. using a number line or number track and concrete resources to support  	**Children will draw their own number lines** to support subtraction and ensure that jumps are draw with the correct size and underneath  	**Children will subtract mentally** using various methods e.g. counting backwards, number lines, using fingers 6-2=4

Finding the difference by using cubes, numicon, part whole models or other objects What is the difference between 8 and 6? 	**Children to draw the cubes/other concrete resources they have used to find the difference** What is the difference between 8 and 6? Show your workings. 	**Find the difference between 8 and 6.** **Children will understand that to find the difference they can subtract e.g. 8-6=?** They may wish to draw a number line to support this or calculate mentally by counting backwards.
Making 10 by using numicon or tens frames 14-5=? 	**Children to present the tens frame pictorially by drawing counters and crossing out** 	14-5=9 You want the children to understand related facts and use number bonds to support understanding. 14-4=10 14-5=9 As the number being subtracted has increased the answer has decreased as you are subtracting more.

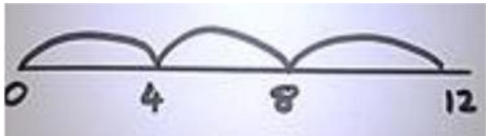
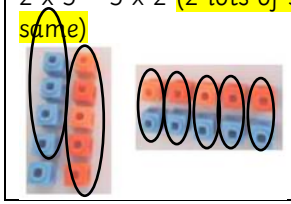
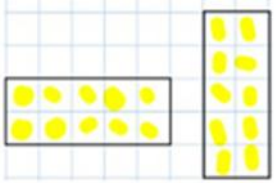
Column method using base 10 (this can be done with straight forward subtraction or borrowing/exchanging) The base 10 must be physically moved away. 48 – 17 = 31  	**Children to use place value chart or draw base ten to support column method** they must cross out the number that is being subtracted 48 – 17 = 31  	**Children will mentally subtract by counting backwards** they may draw a number line, column method or use their fingers for support 48-17=31 

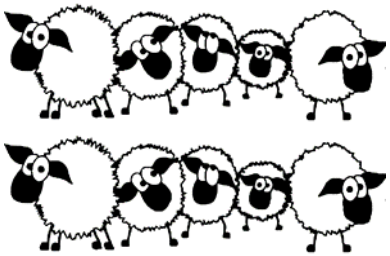
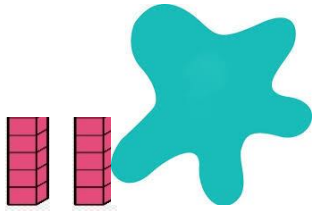
Fluency variation, different ways to ask children to solve addition problems as indicated by White Rose Maths: e.g. 36 - 14

 	Raj spent £36 and Timmy spent £14. How much more did Raj spend? I had 36 metres to run. I stopped after 14. How many more metres do I have left to run?	36 – 14 = ? ? = 36 – 14 36 - 14 Subtract 14 from 36. What is 14 less than 36?	Missing digit problems: 

Multiplication-

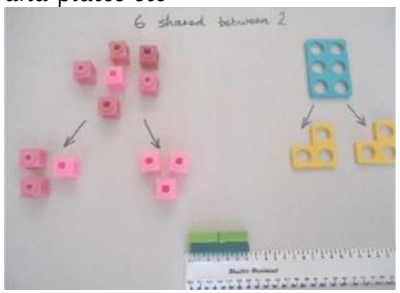
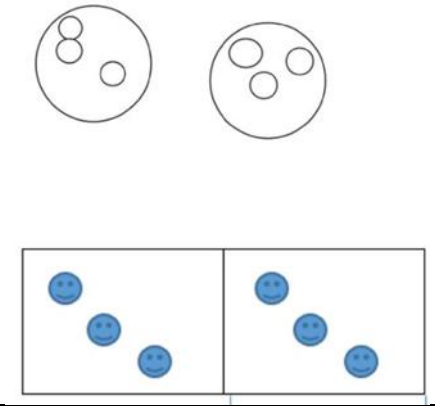
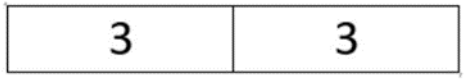
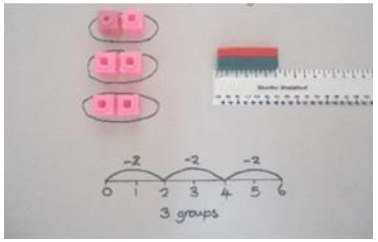
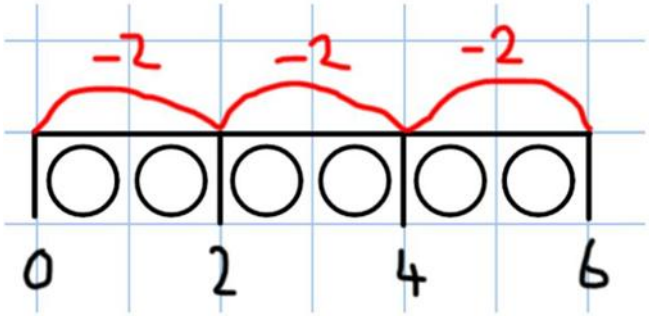
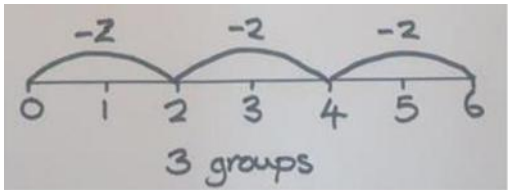
Key language which should be used: double, times, multiplied by, the product of, groups of, lots of, 'is equal to' 'is the same as'

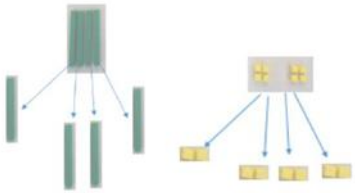
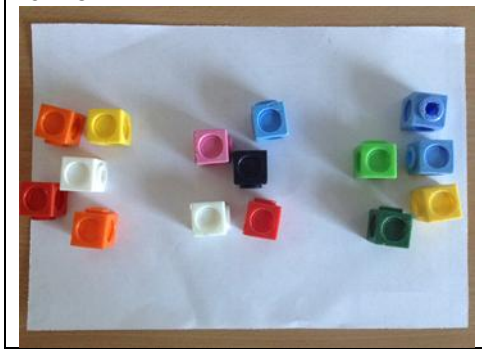
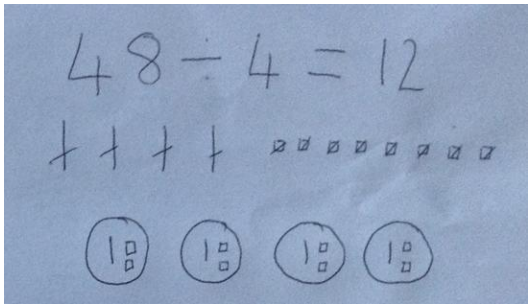
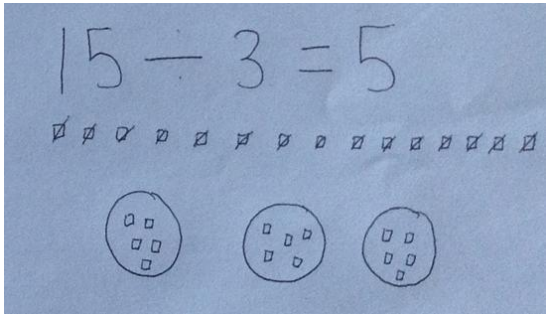
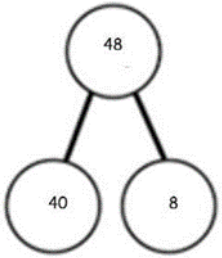
Concrete	Pictorial	Abstract
Repeated grouping/repeated addition 3 x 4 and 3 lots of 4 	**Children to represent the practical resources in a drawing** *e.g* 3 x 4 = 12 XX XX XX XX XX XX 	**Children to mentally calculate multiplication by repeated addition or by counting up in groups** 3 x 4 = 4 + 4 + 4 4 + 4 + 4 = 12
Using number lines to show addition of repeated groups *e.g.* 3 x 4 or 3 lots of 4 	**Represent this pictorially alongside a number line** *e.g.* 3 x 4 or 3 lots of 4 	**Children to calculate by drawing their own number line** 3 x 4 = 12 
Children to use arrays to illustrate commutativity counters and other obejects can be used 2 x 5 = 5 x 2 (2 lots of 5 and 5 lots of 2 are the same) 	**Children can draw their own arrays and group the counters drawn** 2 x 5 = 5 x 2 	**Children to use an array to write all possible calculations** *e.g.* 2 x 5 = 10 5 x 2 = 10 2 + 2 + 2 + 2 + 2 = 10 5 + 5 = 10

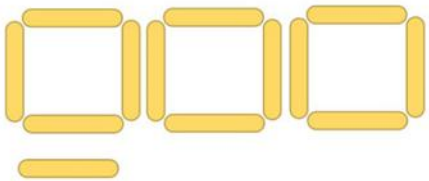
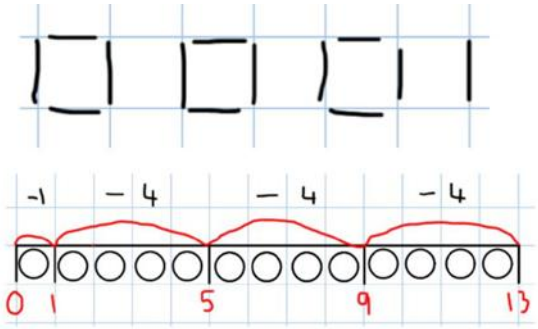
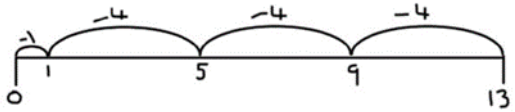
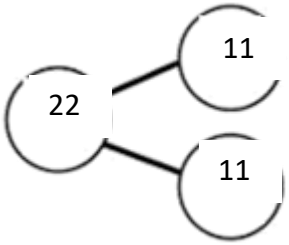
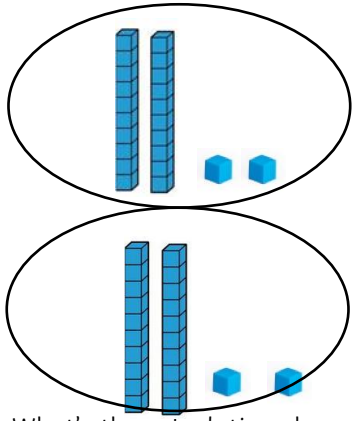
Fluency variation, different ways to ask children to solve addition problems as indicated by White Rose Maths: e.g. 2 x 5			
 There are ____ equal groups with ____ in each group. There are two _____. ____ + ____ = _____ ____ lots of _____ = ______ ____ x ____ = _____ With counters prove that 2 x 5 = 10 Why is 2 x 5 = 5 x 2 ?	Mai walks past 2 fields on her way to school. She see 5 sheep in each field. How many sheep does she see each day?	Find the product of 2 and 5. 2 x 5 = ? ? = 2 x 5	 Some groups of 5 are hidden. The answer is less than 30. What could the possible combinations be? Explain your answer. ? x 5 = ?

Division-

Key language which should be used: share, group, divide, divided by, half, 'is equal to' 'is the same as'

Concrete	Pictorial	Abstract
6 shared between 2 other concrete objects can be used as well e.g. children and hoops, cakes and plates etc 	**Children can draw out 2 groups and draw the 6 counters into them, putting one in each as they go** 	The children will use their knowledge of times tables to count in 2s, knowing that 2 goes into 6 3 times 6 ÷ 2 = 3 
Children to understand division as repeated grouping and subtracting 6 ÷ 2 = 	**Children to draw out on given number line and divide using grouping and repeated subtraction** 6 ÷ 2 = 	**Children to calculate on their own number line by grouping and repeated subtraction** 6 ÷ 2 = 
Division no remainders NB - Children are to understand that division	**Division no remainders** NB - Children are to understand that division can	**Division no remainders**

can mean 'sharing' or grouping' depending on context of question **Sharing** **Start with the tens and share into 4 groups. Then share the ones into 4 groups. Ensure one is put in each group at a time then start again.** 48 ÷ 4 =  **Sharing** **With smaller numbers this can be done by using counters and sharing out into groups** 15 ÷ 3 = 	mean 'sharing' or grouping' depending on context of question **Sharing** 48 ÷ 4 =  **Sharing** **With smaller numbers this can be done by drawing counters and sharing out into groups** 15 ÷ 3 = 	Mental calculations dividing the tens and then the ones: 4 tens ÷ 4 = 1 ten 8 ones ÷ 4 = 2 ones 1 tens and 2 ones = 10 + 2 = 12 

Division with remainders **Children can use lolly pop sticks, cubes etc to demonstrate by forming wholes to see that one is left over** 13 ÷ 4 = 3 r 1 	**Division with remainders** **Children to draw out resources used by grouping and seeing that some are left over** 13 ÷ 4 = 3 r 1  	**Division with remainders** **Children to use their knowledge of times tables to work out the inverse in their head** 13 ÷ 4 = 3 r 1 
Fluency variation, different ways to ask children to solve addition problems as indicated by White Rose Maths: e.g. 22 ÷ 2 =		
Can you share 20 into 2 groups using part whole model?  	I have £22 and I share it equally between my sister and I. How much do we each get?	22 ÷ 2 = ? ? = 22 ÷ 2 How many 2's go into 22?
 What's the calculation shown above?		