Progression within Calculation

	Nursery	Reception	Year 1	Year 2

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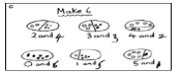
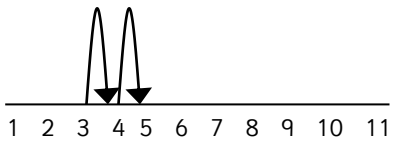
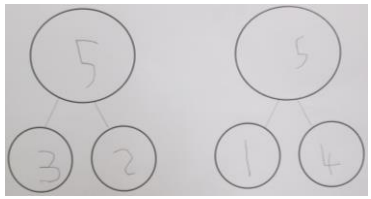
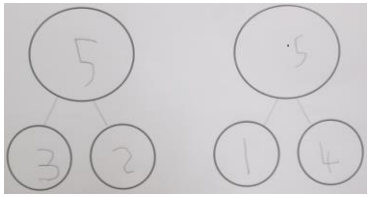
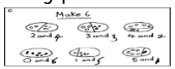
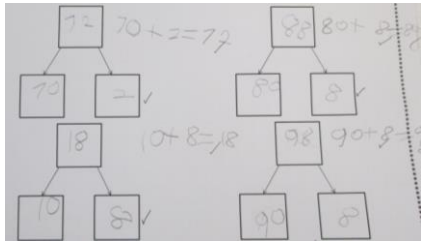
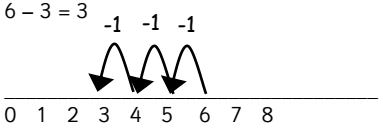
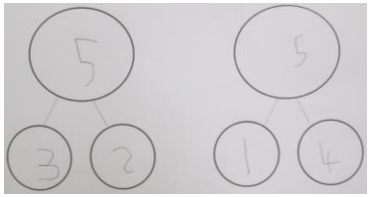
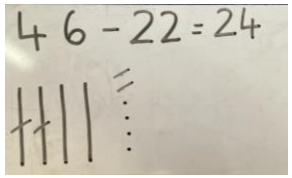
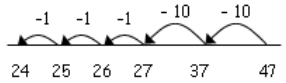
Addition	Children begin by gaining a strong knowledge of counting and number. Children will identify when groups of objects are the same, when there are more or when there are less. Children will be taught the skills of subitising, where they can identify a total without counting 1:1. Children will be encouraged to represent numbers in different way e.g.   Children are encouraged to show an interest in Number problems through daily interactions with adults within the continuous provision. For example: - Role play - I wanted 3 apples, but I've only got 2, what could I do? Mark making - I've drawn 4 spots, but meant to draw 5, how many more should I draw? Water – Look 2 speckled frogs are in the water and 3 are on the log. How many are there altogether? Maths area – Which other dominoes have 4 spots. What's the same? What's different? Children will engage in a wide variety of songs and rhymes, games and activities. Children will find one more than a given number.	Children are encouraged to develop a mental picture of the number system in their heads to use for calculation. They develop ways of recording calculations using pictures, etc.  They use numberlines and practical resources to support calculation and teachers *demonstrate* the use of the numberline. 3 + 2 = 5 + 1 + 1  1 2 3 4 5 6 7 8 9 10 11 Children are also taught to use the part part whole model as a strategy for addition. 	Children begin their addition learning by using the part part whole model to help them to understand each number in a number sentence.  Using pictures  They use numberlines and practical resources to support calculation and teachers *demonstrate* the use of the numberline. Children then begin to use numberlines to support their own calculations. Children begin to add by putting the biggest number in their head and counting on using their fingers. Children to use base 10 to help with their understanding of place value. They begin to use this to help add 10 to a number. Children are also taught the part part whole model as a strategy for addition and partitioning. 	Children will begin to add multiples of 10 using their knowledge of place value. Children will use base 10 first and will then move on to drawing their base 10 once secure.  Children will begin to add two, 2 digit numbers using partitioning and recombining. Children will add the tens first, then the units. Finally they recombine. Children will begin to use 'empty number lines' themselves starting with the larger number and counting on. ✓ First counting on in tens and ones. 34 + 23 = 57 +10 +10 +1 +1 +1 34 44 54 55 56 57 ✓ Then helping children to become more efficient by adding the tens in one jump, then the units. Children move onto calculations which require bridging through ten Children will continue to use empty number lines with increasingly large numbers. They will count on from the largest number irrespective of the order of the calculation. **Children are always encouraged to look for number bonds/number facts to help them solve any addition calculation quickly and efficiently.**

Progression within Calculation

	Nursery	Reception	Year 1	Year 2
Subtraction	Children begin by gaining a strong knowledge of counting and number. Children will identify when groups of objects are the same, when there are more or when there are less. Children will be taught the skills of subitising, where they can identify a total without counting 1:1. Children will be encouraged to represent numbers in different way e.g.   Children are encouraged to show an interest in Number problems through daily interactions with adults within the continuous provision. Children are encouraged to show an interest in Number problems through daily interactions with adults within the continuous provision. For example: - Role play - I wanted 3 apples, but I've got 5, I have too many. What could I do? Mark making - I've drawn 4 spots, but meant to draw 3, how many should I take away? Water – Look there were 5 speckled frogs on the log. Two are now in the water. How many are left on the log? 	Children are encouraged to develop a mental picture of the number system in their heads to use for calculation. They develop ways of recording calculations using pictures etc.  They use numberlines and practical resources to support calculation. Teachers *demonstrate* the use of the numberline. The numberline should also be used to show that 6-3 means the 'difference between 6 and 3' or the 'difference between 3 and 6'. 6 – 3 = 3  	Children begin their subtraction learning by using the part part whole model to help them to understand each number in the number sentence.  Children will then hear lots of number stories relating to subtraction and will use pictures and objects to help them to understanding each calculation.  Children then begin to use number lines to support their own calculations - using a numbered line to count back in ones. The numberline should also be used to show that 6 - 3 means the 'difference between 6 and 3' or 'the difference between 3 and 6' and how many jumps they are apart. Children begin to subtract by putting the biggest number in their head and counting back using their fingers. Children use base 10 to help with their understanding of place value. They begin to use this to help add 10 to a number. **Counting on / Finding the difference:** Children find a small difference by counting on from the smallest number to the biggest.	Children will begin to subtract multiples of 10 using their knowledge of place value. Children will use base 10 to subtract a multiple of 10 from any number and to begin to subtract two 2 digit numbers. Once children are secure with base 10 they will begin to draw their base 10.  Children will begin to use empty number lines to support calculations. ✓ First counting back in tens and ones. 47 – 23 = 24  ✓ Then helping children to become more efficient by subtracting the tens first, then the units. Children will continue to use empty number lines with increasingly large numbers. **Counting on / Finding the difference** If the numbers involved in the calculation are close together or near to multiples of 10, 100 etc, it can be more efficient to count on. When the numbers are close together they can count on mentally ie 76 – 72 = 4 When the numbers are further apart children need to use the strategy of bridging by counting on from the smallest number. **Children are always encouraged to look for number bonds/number facts to help them solve any subtraction calculation quickly and efficiently.**

Progression within Calculation

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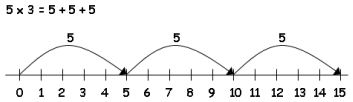
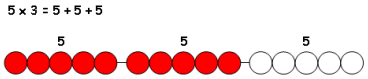
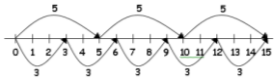
Multiplication		Children will experience equal groups of objects. They will count in 2s and 10s and begin to count in 5s. Children may count how many fingers in tens or pairs of eyes in twos.  They will work on practical problem solving activities involving equal sets or groups. 	Children will experience equal groups of objects. They will count in 2's, 10s and 5's. Children may use bead strings or money to count in different ways.   They will work on practical problem solving activities involving equal sets or groups. They make connections between arrays, number patterns, addition calculations and counting in 2's, 5's and 10's. Children may use objects to show the number sentences 4 x 2. 	Children will develop their understanding of multiplication and use jottings to support calculation: ✓ **Repeated addition** 3 times 5 is 5 + 5 + 5 = 15 or 3 lots of 5 or 5 x3 Repeated addition can be shown easily on a number line:  and on a bead bar:  ✓ **Commutativity** Children should know that 3 x 5 has the same answer as 5 x 3. This can also be shown on the number line.  ✓ **Arrays** Children should be able to model a multiplication calculation using an array. This knowledge will support with the development of the grid method. 

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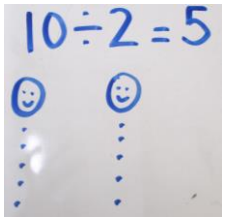
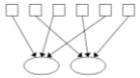
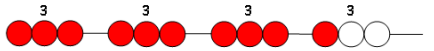
Division		Children will understand equal groups and share items out in play and problem solving. They will count in 2s and 10s and later in 5s.  Children will use objects and bead strings to share out equally.  	Children will understand equal groups and share items out in play and problem solving. They will count in 2s and 10s and later in 5s.  Children will solve one-step problems involving division using concrete objects and pictorial representations. 	Children will develop their understanding of division and use jottings to support calculation ✓ **Sharing equally** 6 sweets shared between 2 people, how many do they each get?  ✓ **Grouping or repeated subtraction** There are 6 sweets, how many people can have 2 sweets each?  ✓ **Repeated subtraction using a number line or bead bar** 12 ÷ 3 = 4   The bead bar will help children with interpreting division calculations such as 10 ÷ 5 as 'how many 5s make 10?' ✓ **Using symbols to stand for unknown numbers to complete equations using inverse operations** ☐ ÷ 2 = 4 20 ÷ △ = 4 ☐ ÷ △ = 4