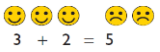
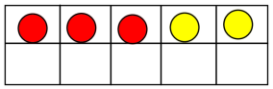
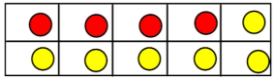
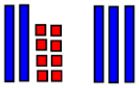
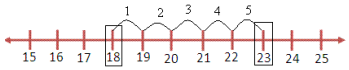
Sholing Infant School **All four operations and fractions methods Progression**

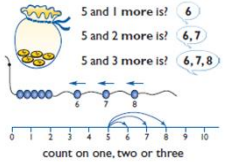
Mathematics

Number- Calculation Addition and Subtraction		
Year R addition methods	**Year 1 addition methods**	**Year 2 addition methods**
number songs and rhymes supporting counting combining two sets of practical objects including working with numicon, before going on to recording a sum and representing their addition in their own ways, e.g.  3 + 2 = 5 This should be applied to problem solving as the year progresses to broaden experiences Children should begin to explore 10s frames to show simple addition below 10.  By end of summer term in readiness for Year 1- drawing magic buttons to represent numbers then adding the buttons together. Only suitable for smaller numbers as once children begin to add sets of 'teen' numbers this becomes inefficient and can lead to mistakes in counting.  5+3=8 'Magic buttons'	Quick recapping of combining two sets of practical objects before recording a sum in line with a CPA approach, quickly leading to; use of part-part whole models to understand two parts of a total, recording both addition sentences. used alongside practical resources initially  7 + 3 = 10 3 + 7 = 10 use of a tens frame alongside part-part whole models to understand two parts of a total, recording both addition sentences  4 + 6 = 10 6 + 4 = 10 drawing magic buttons to represent numbers then adding the buttons together. Only suitable for smaller numbers as once children begin to add sets of 'teen' numbers this becomes inefficient and can lead to mistakes in counting.  5+3=8 'Magic buttons'	**adding three one-digit numbers** Should be achievable mentally as only single digits, number line could support WT pupils.  Start by looking for any known number bond pairs to 10, then count on the third number mentally. If no pairs are evident, start with the biggest number and count on twice to reach the total. **a two-digit number and ones**  Put the biggest number in your head then count on, should be achievable mentally, number line could support WT pupils. **a two-digit number and tens**  Begin with making the numbers from apparatus to secure understanding of place value. Pupils will then begin to represent the numbers by drawing both parts. They should be able to count on in tens from the first number, solving this mentally by the end of KS1, only needing jottings if unsure.  **two two-digit numbers**

counting **on** from the biggest number using a number line and recording their number sentences

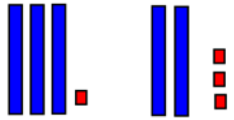


counting **on** mentally- children may begin to add mentally once they are able to count on from a given number. Often begins with putting the number in their head and counting on using their fingers. Pupils may also refer to a number line as they count.



Practical then jottings non-bridging (carrying)
begin by making both 2 digit numbers with practical apparatus before moving onto drawing both numbers. Pupils should add the tens first, then count on the ones (non bridging)

31+ 23= 54



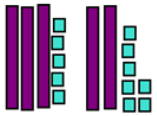
Non-bridging (carrying) for column method

42 + 25 = 67

	TU
	42
+	25
	67

Practical then jottings with bridging (carrying)

35 + 27 = 62

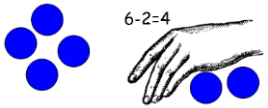
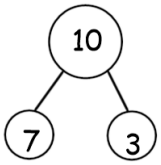
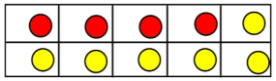
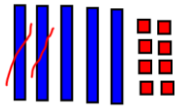
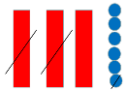


Bridging (carrying) for column method

45 + 36 = 81

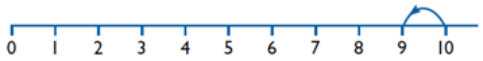
	TU
	45
+	36
	1
	81

Sholing Infant School **All four operations and fractions methods Progression**

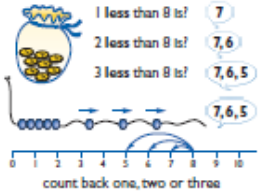
Year R subtraction methods	Year 1 subtraction methods	Year 2 subtraction methods
number songs and rhymes supporting counting backwards practically taking away including working with numicon, before going on to recording a sum and representing their subtractions in their own ways  This should be applied to problem solving as the year progresses to broaden experiences Crossing out an amount from a set of pictures to show subtraction 5-3=2  By end of summer term in readiness for Year 1- drawing magic buttons to represent first number then crossing out the second number 7 - 4 = 3 	Quick recapping of practical subtraction before recording a sum in line with a CPA approach, quickly leading to; use of part-part whole models to understand two parts of a total, recording both subtraction sentences. used alongside practical resources initially  10 - 7 = 3 10 - 3 = 7 use of a tens frame alongside part-part whole models to understand two parts of a total, recording both subtraction sentences  10 – 4 = 6 10 – 6 = 4 drawing magic buttons to represent biggest number then crossing out the number to be subtracted 7 - 4 = 3 	**subtracting ones from a two-digit number**  Put the biggest number in your head then count back, should be achievable mentally, number line could support WT pupils. **subtracting tens from a two-digit number**  Begin with making the numbers from apparatus to secure understanding of place value. Pupils will then begin to represent the numbers by drawing the first number and crossing out the amount to take away. They should be able to count back in tens from the first number, solving this mentally by the end of KS1, only needing jottings if unsure.  **subtracting two two-digit numbers** **Practical then jottings no exchanging** begin by making the largest number with apparatus then taking away the smaller number. Pupils should then move onto drawing and crossing out (ones first, then tens) 36 – 21 = 15  **Non- borrowing column method**

counting **back** from the biggest number using a number line and recording their number sentences

1 **less** than 10 is 9
10 **subtract** 1 equals 9
10 – 1 = 9



counting **back** mentally- children may begin to subtract mentally once they are able to count back from a given number. Often begins with putting the number in their head and counting back using their fingers. Pupils may also refer to a number line as they count



count back one, two or three

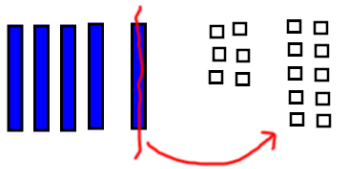
56-32= 24

TU
56
-32

24

Practical then jottings with exchanging
begin by making the largest number with apparatus, then exchanging the last tens rod for ten ones, before taking away the smallest number. Pupils should then move onto drawing this by crossing out their last ten and drawing ten extra ones

56 - 38 =



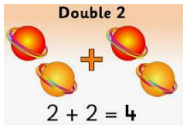
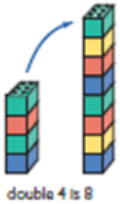
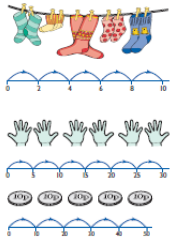
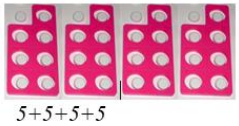
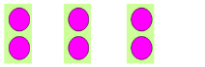
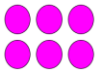
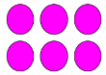
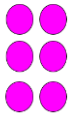
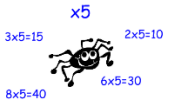
Borrowing column method

56-38=

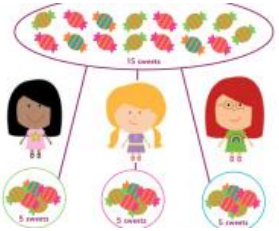
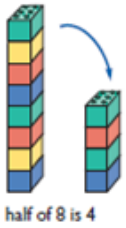
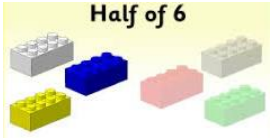
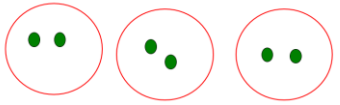
TU
~~5~~4 ~~6~~16
38

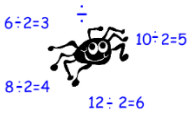
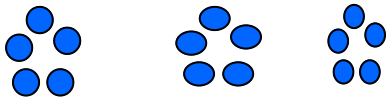
18

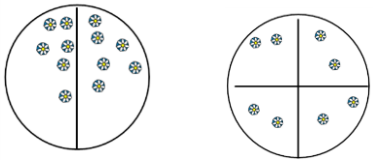
Sholing Infant School **All four operations and fractions methods Progression**

Number- Calculation Multiplication and Division		
Year R multiplication methods	**Year 1 multiplication methods**	**Year 2 multiplication methods**
Beginning to double numbers practically by understanding they are adding the same number twice, using "double 2 is 4" as a language model.    5 + 5 = 10	rote counting in a multiple pattern (e.g. 2,4,6,8,10…) for 2's, 5's and 10's using number lines and hundred squares  begin to understand multiplying by adding groups of the same quantity together through **repeated addition.** Practically first then beginning to record   2 + 2 + 2 = 6 begin to work with **arrays-** a way of setting out their sets/groups/lots in a grid pattern  3 groups of 2 = 6 NB- the Year 1 curriculum does not require pupils to be formally introduced to the multiplication sign X- we choose to introduce this to develop pupils understanding of the concept and to speed up their recordings NB- doubling and halving is a non-statutory objective for Year 1, as this has been taught in Reception it is quickly recapped after multiplication and division has been taught	rote count in a multiple pattern (e.g. 2,4,6,8,10…) for 2's, 3's, 5's and 10's, build on from using number lines and hundred squares to mental recall developing understanding of **arrays** in more depth. Begin to understand that multiplication can be done in any order and will give the same total- **commutative law**  3 x 2 = 6  2 x 3 = 6 learning multiplication (and corresponding division) facts. Pupils have already experienced counting in multiples of 2, 3, 5 and 10, but because this is rote counting they do not always make number connections. It is therefore important to explicitly teach multiplication (and division) facts, so that pupils are able to quickly recall these to aid calculation, and to make 'number sense' of the connections between groups of numbers 

Sholing Infant School **All four operations and fractions methods Progression**

Year R division methods	Year 1 division methods	Year 2 division methods
'equal-sharing between' practically through 1:1 correspondence using the '1 for you 1 for me' approach.  begin to understand halving as sharing an amount equally between two groups so both groups have the same amount  half of 8 is 4  Half of 6	counting backwards in 2's, 5's and 10's. Pupils begin to learn to count aloud in these patterns, often using a number line to spot the jumps  0 2 4 6 8 10 Practical equal sharing between pre-printed hoops 6 shared by 3 = 2  Beginning to record their equal sharing by being given pre-printed hoops then equally sharing by drawing the dividend (amount to be divided) into the hoops equally through 1:1 correspondence using the '1 for you 1 for me' approach. NB- the Year 1 curriculum does not require pupils to be formally introduced to the division sign ÷ we choose to introduce this to develop pupils understanding of the concept and to speed up their recordings NB- doubling and halving is a non-statutory objective for Year 1, as this has been taught in Reception it is quickly recapped after multiplication and division has been taught	rote count backwards in a multiple pattern (e.g. 20, 18, 16, 14……) for 2's, 3's, 5's and 10's, build on from using number lines and hundred squares to mental recall Recording 'equal-sharing between'. Pupils should be encouraged to draw the amount of hoops to represent the divisor (amount being divided by, e.g. in 10 ÷ 2 the divisor is 2). Pupils should then equally share by drawing the dividend (amount to be divided) into the hoops equally through 1:1 correspondence using the '1 for you 1 for me' approach. 6 ÷ 3 = 2  'equal-sharing between' with remainders. The remainder can then be made explicit by being 'left over' from their recording. 7 ÷ 3 = 2 r1  7÷3=2r1 7 shared between 3 11÷2=10 r 1  learning division (and corresponding multiplication) facts. Pupils have already experienced counting in multiples of 2, 3, 5 and 10, but because this is rote counting they do not always make number connections. It is therefore important to explicitly teach division (and multiplication) facts, so that pupils are able to quickly recall these to aid calculation, and to make 'number sense' of the connections between groups of numbers

		 understanding division as grouping. Pupils will need to use both the equal-sharing between and inverse-of multiplication, or grouping, structure confidently, as the context of a problem will determine the structure needed to solve it. *e.g. There are 15 people who need to travel in cars to a concert. Each car can hold 5 people. How many cars would we need?*  15÷5=3 15 counters grouped in 5s 3 groups

Number- Fractions		
Year R methods	**Year 1 methods**	**Year 2 methods**
See multiplication and division for halving and equal sharing methods	Practical halving and quartering with pre-printed circles divided into halves and quarters  Beginning to draw their halving and quartering on pre-printed circles divided into halves and quarters	Quick recap of practical resources as input, some children may need to physically practise then move to drawing own circles to show their halving, quartering and diving into thirds Use of practical resources for exploring equivalence