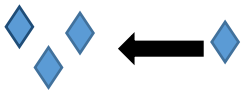
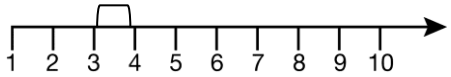
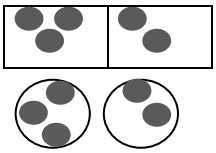
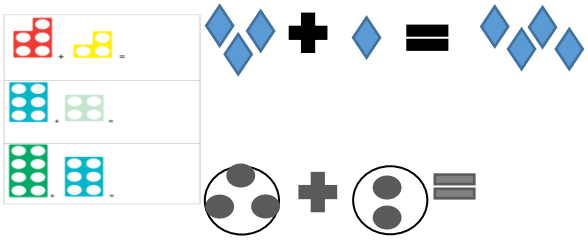
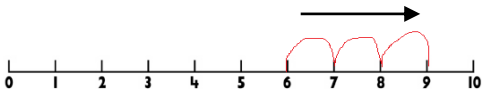
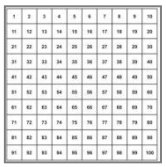
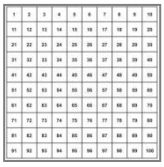
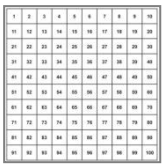
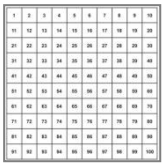
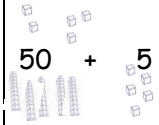
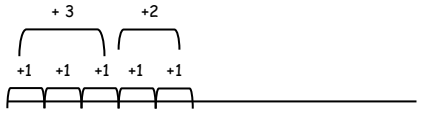
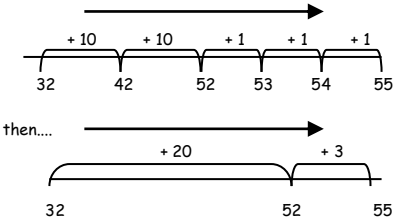
Calculation Policy – Early Years Foundation Stage and Key Stage 1

Addition

Stage	Pictorial example	Mathematical language
Stage 1 Adding 1 more to a group of objects Practically – no recording	 How many now?	How many? 1 more than How many now? How many altogether more/less
Stage 2 1 more than a given number using a number line		1 more than How many now?
Stage 3 Combining two sets of objects practically to find a total (No symbols and no recording)	 Shuffle board Numicon Sorting rings Cubes/objects	plus add makes equals total
Stage 4 Introduce + = symbols Begin to read number sentences		plus add makes equals total number sentence
Stage 5 Combining/adding two sets of objects using numbers and symbols. EYFS – sheet 1-3 (Appendix 1)	 3 + 1 = 4	plus add makes equals total number sentence
Stage 6 Combine two 1 digit numbers using a shuffle board (including number bonds within 10)		plus add makes equals total number sentence how many altogether
Stage 7 Combine two 1 digit numbers using a number line and then with a 2 digit and a 1 digit number EYFS – sheet 4/5 (Appendix 1)	6 + 3 = 9 	count on how many more how many altogether total answer
Stage 8 Adding two 1 digit numbers by putting large number in their head and then counting on the smaller number and then a 2 digit and a 1 digit number	4 + 7 = Put 7 in your head, hold up 4 fingers…count on from 7	largest smallest digit count on makes/equals total plus/add

<u>Stage 9</u> Find and recall number facts of 4-10. First with objects practically Then begin to record these facts Up to 30, then 50, then 100.	_ + _ = 4 _ + _ = 5 _ + _ = 6 _ + _ = 4 _ + _ = 5 _ + _ = 6 _ + _ = 4 _ + _ = 5 _ + _ = 6 _ + _ = 4 _ + _ = 5 _ + _ = 6 And 7,8,9 and 10 as well	Number facts Addition facts Number bonds total
<u>Stage 10</u> Find 1 more than a given number on a hundred square	Find 1 more than 14 Find 1 more than 28  (→)	1 more Total 1 more than
<u>Stage 11</u> Add a two digit and a 1 digit number using a hundred square. Move onto bridging the next ten (Children know what number comes next once they reach the end of a line)	22 + 5 Find 22 on the square, add 5  Find 29, add 5 (bridging 10)	2 digit number 1 digit number Add Plus More Sum of row
<u>Stage 12</u> Add a two digit and a ten number using a hundred square. Move onto adding multiples of 10 (e.g. 30, 40)	28 + 10 = ↓ Find 28 on the square, add 10  28 + 20 = ↓ ↓ ↓	Tens 2 digit number Add Plus More Sum of Multiples of 10
<u>Stage 13</u> Add a two digit and a two digit number together using a hundred square. Without bridging , then with bridging 10	24 + 32 =  Add the tens first ↓ Then the ones →	Tens Ones Add Plus More Sum of Two digit
<u>Stage 14</u> Add by partitioning into tens and ones using -tens and ones rods – practically. -numicon -10p and 1p coins (Add the tens first and then the ones) Then partitioning (bridging ten) Eg. 37 + 24	32 + 23 =  30 + 20 = 50 (add the tens)  2 + 3 = 5 (add the ones)  50 + 5 = 55 37 + 24 30 + 20 = 50 (add the tens)  7 + 4 = 11 (add the ones)  50 + 11 =	tens ones arrow cards How many tens? How many ones? partitioning sum of add, plus total, altogether

<u>Stage 15</u> Add three 1 digit numbers Using blank number line - mentally	4 + 3 + 2 =  	add plus more greater altogether total sum of
<u>Stage 16</u> Add by partitioning into tens and ones (recording only – no objects) (Add the tens first and then the ones)	32 + 23 = 55 30 + 20 = 50 (add the tens) 2 + 3 = 5 (add the ones) 50 + 8 = 58) add the ones and tens)	tens ones arrow cards How many tens?ones? partitioning add, plus sum of total, altogether
<u>Stage 17</u> Adding by partitioning using a blank number line (Add the tens first and then the ones)	32 + 23 =  	tens ones arrow cards How many tens?ones? partitioning blank number line add, plus sum of total, altogether
<u>Stage 18</u> Add by using the expanded column method (Add the ones first and then the tens)	32 + 23 5 (2 + 3) 50 (30 + 20) 55	tens ones arrow cards How many tens? How many ones? partitioning expanded column method add, plus sum of total, altogether
<u>Stage 19</u> Add using the compact column method (no expanding)	32 + 23 55	tens ones arrow cards How many tens? How many ones? partitioning compact column method add, plus sum of total, altogether
<u>Stage 18</u> Addition number sentences with missing numbers in all possible places	3 + 4 = □ □ = 3 + 4 3 + □ = 7 7 = □ + 4 □ + 4 = 7 7 = 3 + □ □ + ▽ = 7 7 = □ + ▽	missing number How many more? How many more to make? 3 plus how many more to make...?

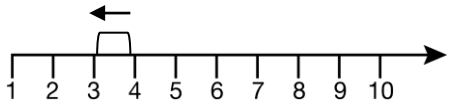
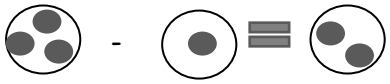
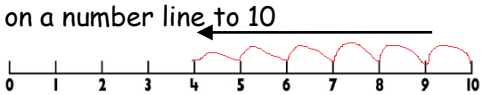
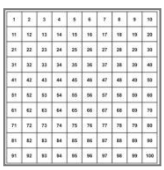
<u>Stage 9</u> Adding two single digits. Equals sign should be written either side of number sentence to show that the sign is not just interpreted as 'the answer'	5 = 4 + 1 4 + 1 = 3 + 2 4 + 1 = 5 1 + 1 + 1 + 1 + 1 = 5	equals balances same as

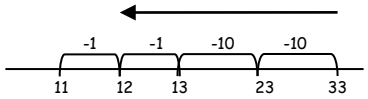
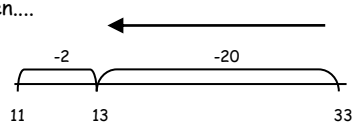
<u>Notes for Addition</u>

For deep mastery;

* Link to worded one step problems, building up to two step problems.
* Use addition within problem solving/worded problems and make connections to measures (time, length, weight, scales) and money.
* Addition is commutative (2 numbers can be added in any order)
* Practise addition and subtraction to 20 to become fluent in deriving facts such as
  3 + 7 = 10, 10 – 7 = 3 and 7 = 10 – 3 to calculate;
  30 + 70 = 100, 100 – 70 = 30 and 70 = 100 – 30
  to ensure they are checking their calculations by adding to check subtraction and adding numbers in a different order to check addition 5 + 2 = 7, 2 + 5 = 7

Subtraction

Stage	Pictorial example	Mathematical language
Stage 1 Singing number songs an action rhymes	5 little speckled frogs 10 in the bed 5 little men on a flying saucer 5 currant buns 10 green bottles	1 less take awaw How many are left? smaller
Stage 2 Taking away 1 from a group of objects Use a number card to place a given amount of objects into a circle. Roll a dice with 1 spots on it Practical – no recording	 physically take 1 away	How many left? 1 less than 1 less smaller How many now? How many altogether number words take away
Stage 3 1 less than a given number using a number line		1 less than How many now? takeaway count back
Stage 4 Taking away a given amount from a group of objects. No recording.		How many are left? Takeaway
Stage 5 Introduce - = symbols Begin to read number sentences Practical – no recording at first Build up to recording (see subtraction sheets 1-4)	 	subtract less take away makes How many are left? number sentence
Stage 6 Subtracting 1 set from another set of objects using numbers and symbols. Recording EYFS – sheet 1-4 (Appendix 2)	 3 - 1 = 2	subtract less take away makes How many are left? number sentence
Stage 7 Subtracting a 1 digit number using a number line from a 1 digit number then a 2 digit number Counting back on a number line (For finding the difference children can also count forwards on the line)	a) 10 – 6 = 4 Do practically with objects b) Do on a number line to 10  c) Do on a number line to 20	subtract count backwards take away minus difference between How many left?
Stage 8 Subtracting a 1 digit from a 2 digit number on a hundred square -Up to 30, then 50, then 100. move onto subtracting a 2 digit from a 2 digit number using a hundred square (Subtract the tens first then ones)	 26 - 24 Find 26 on the square, subtract 4 by counting backwards 26 - 24 First subtract the 2 tens (↑) Then subtract the 2 ones (←)	subtract count backwards count on from take away minus difference between How many left? missing numbers hundred square

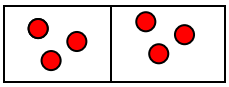
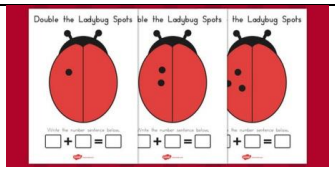
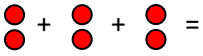
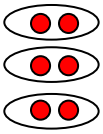
<u>Stage 9</u> Subtracting using a blank number line – partitioning method (Subtract the tens first, then the ones)	33 - 22 =  then....  	subtract minus less fewer take away minus difference between How many left? tens ones number line
<u>Stage 10</u> Subtracting using the expanded column method (Subtract the ones first and then the tens)	33 - 22 1 (3 - 2) 10 (30 - 20) 11	subtract minus less fewer take away minus difference between How many left? tens ones expanded column method
<u>Stage 11</u> Subtract using the compact column method (no expanding)	33 - 22 11	subtract minus less fewer take away minus difference between How many left? tens ones column method
<u>Stage 12</u> Subtraction number sentences with missing numbers in all possible places	7 - 3 = □ 7 - □ = 4 □ - 3 = 4 □ - ▽ = 4 □ = 7 - 3 4 = □ - 3 4 = 7 - □ 4 = □ - ▽	subtract count backwards count on from take away minus difference between How many left? missing numbers
<u>Stage 13</u> Subtract exchanging using two digit numbers Two step column method to ensure children's understanding of the value of the digits (Subtract the ones first then the tens)	75 – 37 = 70 5 - 30 7 (70 - 10) (10 + 5) 60 15 ~~70~~ ~~5~~ - 30 7 30 8 6 15 ~~7~~ ~~5~~ - 3 7 3 8	subtract minus less fewer take away minus difference between How many left? tens ones column method exchange

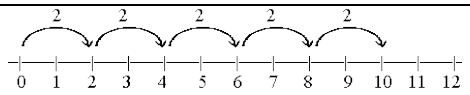
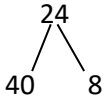
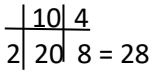
Notes for Subtraction

For deep mastery;

* Link to worded one step problems, building up to two step problems.
* Use subtraction within problem solving/worded problems and make connections to measures (time, length, weight, scales) and money.
* Subtraction is not commutative (2 numbers cannot be subtracted in any order)
* Recognise the inverse relationship between addition and subtraction and use this to check calculations and missing number problems.
* Practise addition and subtraction to 20 to become fluent in deriving facts such as
  3 + 7 = 10, 10 – 7 = 3 and 7 = 10 – 3 to calculate;
  30 + 70 = 100, 100 – 70 = 30 and 70 = 100 - 30

Multiplication

Stage	Pictorial example	Mathematical language
Stage 1 Grouping objects into pairs and counting in 2's		counting in 2's, 5's, 10's groups of sets of lots of pairs
Stage 2 Counting up in 2's, 5's and 10's with/without actions -Up to 10 times the number (EYFS) -Up to 12 times the number (KS1) Practical – no recording	2 4 6 8 10 12 14 16 18 20 22 24 5 10 15 20 25 30 35 40 45 50 55 60 10 20 30 40 50 60 70 80 90 100 110 120	2's 5's 10's count up in steps of….
Stage 3 Doubling using objects	 double 3	double doubling
Stage 4 Doubling using objects Recording using pictorial representations and recording using symbols		doubles/eg and add makes/equals
Stage 5 Repeated addition with objects	 2 + 2 + 2 = 3 lots of 2 =	repeated addition lots of sets of groups of
Stage 6 Using arrays and introduce the X sign	 2 + 2 + 2 = 3 lots of 2 = 3 X 2 =	multiply times lots of groups of sets of arrays
Stage 7 Showing that multiplication is commutative (Can be done in any order)	3 X 2 = 6  2 X 3 = 6 	Inverse arrays multiplication times arrays sets of/groups of/ lots of
Stage 8 Repeated addition/multiplication on a number line Show that multiplication is commutative (Can be done in any order)	2 + 2 + 2 + 2 + 2 = 10 5 lots of 2 = 10 5 X 2 = 10 2 X 5 = 10	multiply times lots of groups of sets of arrays

		
<u>Stage 9</u> Doubling a 2 digit number by partitioning		Doubling tens / ones
<u>Stage 10</u> Multiplying a 2 digit and a 1 digit number using the grid method	2 X 14 = 	grid method times by the tens times by the ones multiplied
<u>Stage 11</u> X = signs and missing numbers	7 X 2 = ☐ ☐ = 2 X 7 7 X ☐ = 14 14 = ☐ X 7 ☐ X 2 = 14 14 = 2 X ☐ ☐ X ☐ = 14 14 = ☐ X ☐	Missing numbers times mulitply
<u>Stage 12</u> Link multiplication facts and division facts Recognise the inverse relationship between multiplication and division and use this to check calculations and missing number problems.	2 X 3 = 6 3 X 2 = 6 6 ÷ 3 = 2 6 ÷ 2 = 3	Inverse relationship multiplication division

<u>Notes for Multiplication</u>

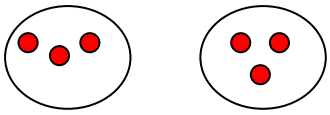
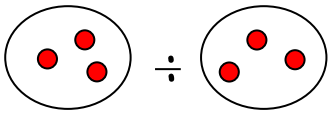
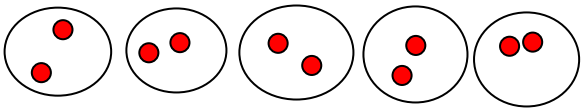
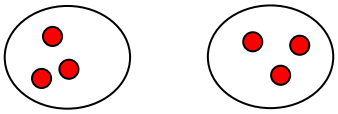
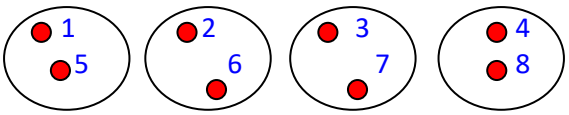
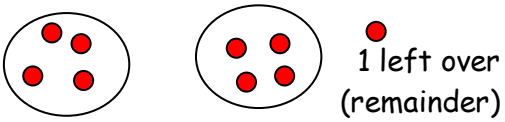
For deep mastery;

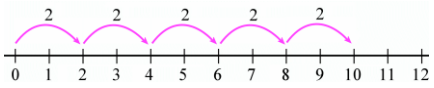
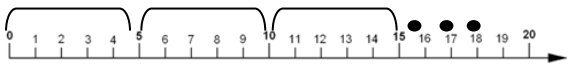
* Link to worded one step problems, building up to two step problems.
* Use multiplication within problem solving/worded problems and make connections to measures (time, length, weight, scales) and money.
* Multiplication is commutative (2 numbers can be multiplied in any order)
* Practise mulitplication to become fluent. Connect the 10 mulitplication table to place value and the 5 mulitplication table to the divisions on the clock face.
* Work with a range of materials and contexts i whcih mulitplication relate to grouping quantities, relating to fractions and measures

Children need to be able to fluently recall multiplication facts by the end of Key stage 1 for the 2,3,5 and 10 times tables up to 12 times the number e.g. 12 X 2 = 24

(Fluency is recalling facts from memory and not using fingers or any resources.)

Division

Stage	Pictorial example	Mathematical language
<u>Stage 1</u> Practical sharing out objects up to any amount (1-1 correspondence) Share out 1 for me, 1 for you - repeat until they've all gone. Link to halving	6 shared equally between 2 	sharing divide halving equally the same as
<u>Stage 2</u> Practical sharing out of objects between 2 people/sorting rings Share out 1 for me, 1 for you - repeat until they've all gone. Link to halving Introduce the sign for division ÷	6 ÷ 2 = 3 	sharing divide halving equally the same as shared by
<u>Stage 3</u> Dividing between 2, 3, 5 and 10 groups using circle and dot method	10 : 5 =  As you count to the total number of objects to be divided put a dot in each circle in turn.	sharing divide halving equally the same as half
<u>Stage 4</u> As in stage 2 but do with worded problems Dot and circle method Introduce $\frac{1}{2}$ sign	6 ÷ 2 = 3  I have 6 pieces of lego. If I share them between me and my friend, how many pieces of lego will we get each?	sharing divide halving equally the same as half
<u>Stage 5</u> Practical sharing out of objects between 4 people/sorting rings Share out 1 for me, 1 for you - repeat until they've all gone. Dot and circle method too Link to quarters Introduce $\frac{1}{4}$ sign link to quarterly intervals on a clock and quarter turns		sharing divide quarters equally the same as half
<u>Stage 6</u> Practical sharing out of objects between 4 people/sorting rings Share out 1 for me, 1 for you - repeat until they've all gone. Dot and circle method too With remainders	9 ÷ 2  1 left over (remainder)	sharing divide shared by not equal remainder left over

<u>Stage 7</u> Division on a number line	10÷2 = 5  	count in 2's counting up number line sharing dividing How many 2's in……?
<u>Stage 8</u> Division on a number line with remainders	18 : 5 = 3r3  	count in ……'s counting up sharing dividing How many ….'s in……? remainder How many left?
<u>Stage 9</u> Divide use problem solving on a number line. How many groups of 4 do you need until you get to 12?	 	Groups of Sharing Dividing Count up in steps of….
<u>Stage 10</u> Link multiplication facts and division facts Recognise the inverse relationship between multiplication and division and use this to check calculations and missing number problems.	2 X 3 = 6 2 X 2 = 6 6÷ 3 = 2 6÷ 2 = 3	Inverse relationship multiplication division
<u>Stage 11</u> ÷ = signs and missing numbers	6÷2 = □ □ = 6÷2 6÷□ = 3 3 = 6 ÷ □ □ ÷ 2 = 3 3 = □ ÷ 2 □ ÷ △ = 3 3 = □ ÷ △	count in ……'s sharing dividing How many ….'s in……? How many left? missing numbers
<u>Stage 12</u> Division using the expanded bus stop method	2⟌46 20 (40÷ 2) 3 (6 ÷ 2) 23	sharing dividing How many ….'s in……? remainder How many left? expanded bus stop
<u>Stage 13</u> Division using the bus stop method number	23 2⟌46 –	count in ……'s sharing dividing How many ….'s in……? remainder How many left? bus stop

Notes for Division

For deep mastery;

* Link to worded one step problems, building up to two step problems.
* Use division within problem solving/worded problems and make connections to measures (time, length, weight, scales) and money. (40 : 2 = 20, 20 is half of 40)
* Division is not commutative (2 numbers cannot be divided in any order)
* Practise division to become fluent. Connect the 5 mulitplication table to the divisions on the clock face.

Work with a range of materials and contexts in whcih division relates to sharing quantities, relating to fractions and measures