Maths Policy

□ The Maths policy aims at making the progression of learning explicit for each of the four mathematical operations.

□ In order to access content related to early numeracy skills preceding conceptual understanding of these operations, please refer to the Non-Subject Specific curriculum (see section 'Early Mathematical Skills', in which you will find number, object, shape, measure and time), The Curriculum ladders steps 1-6 are all predominantly pre-operation as well (number and geometry & measure).

□ All four operations should be reinforced by making links to maths in real life contexts. For all of them please use the CPA approach (concrete – pictorial – abstract) to facilitate understanding and development.

□ Opportunities for cross-curricular or informal mathematics should be sought and utilised, in order to encourage an understanding of the value of mathematics and to reinforce learning. For example, measuring (capacity/weight) can be practised in Food Tech, counting can be exercised whilst gardening etc.

□ In order for this progression to run smoothly, vocabulary, mental calculation strategies and rapid recall facts should be introduced at the appropriate stage, used in context, and reinforced regularly. Interpretation of written signs / symbols also needs to be explicitly taught.

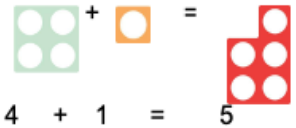
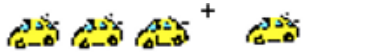
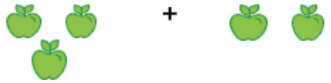
□ It is essential that students are taught according to the stage that they are currently working at, only being moved onto the next stage once they show conceptual understanding and are secure enough to progress.

□ Once students have progressed to written methods of calculation, this policy shows what 'carrying the one', as an example, should look like on paper. This way all students will be taught the same method across the school, making it easier to transition between classes.

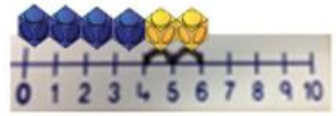
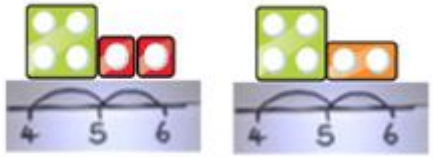
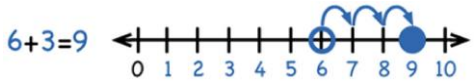
Maths Policy

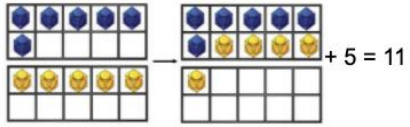
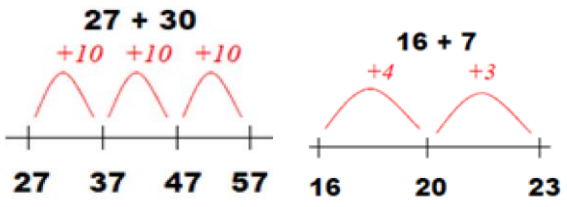
Key language: sum, total, parts and wholes, plus, add, altogether, more, 'is equal to', 'is the same as'

addition

Strategies	Steps 1-6	Steps 7-9	Steps 10-13
Counting objects	Number songs with actions or objects to count / add Counting on fingers consistently Matching numbers to objects		
Counting on	Count on, altogether, one more etc 1 more / 2 more with pictures and numbers Using Numicon  4 + 1 = 5	Using number sentences and mathematical language - count on / altogether / one more/ two more Counting in 2s, 5s and 10s	Counting on in 2s, 5s and 10s from different numbers e.g. 3, 9, 16, within 100.
Number stories	Illustrating number stories with number sentences There are 3 cars in the garage. 1 more came along  3 1 = 4 Terry has 3 apples and Tony has 2 apples. How many altogether? 	Embedding number stories into word problems.	

Maths Policy

Using a number line	Counting on using number lines and cubes or Numicon:   	Using number lines within 10, drawing jumps on prepared lines:  	
Addition with money	Money – using Numicon to help recognition value of coins and simple addition e.g. 5p + 2p	Money and addition up to 20p 	Addition of money up to £1 – using coins 
Related addition facts		Relationships / related facts □ = 5 + 4 5 + 4 = □ 5 + □ = 9 □ + 4 = 9 □ + □ = 9 	Deriving related facts 13 + 7 = 20 7 + 13 = 20 (and link to subtraction) 20 - 7 = 13 20 - 13 = 7

Using number bonds	Beginning to work on number bonds to 10.	Number bonds to 10 (Numicon, Numicon overlays) Regrouping to make 10 using ten frames and counters / cubes, Base 10 or Numicon. 	Number bonds to 20
Addition using partitioning		Partitioning 14 = 10 + 4 (Numicon / Base 10) Part / whole model – separating a number of objects into 2 groups within 10 e.g. 8 is 5 and 3.	Use Base 10 to help partitioning 61 + 14 = 60 + 10 = 70 1 + 4 = 5 70 + 5 = 75 Partitioning into tens and ones and using number lines e.g. 27+30 = 57 

Maths Policy

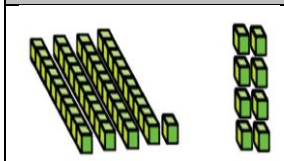
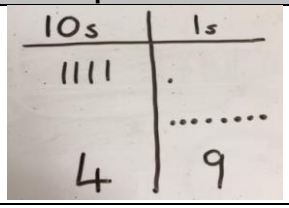
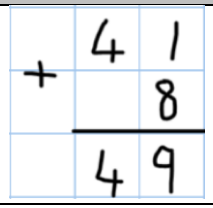
Step 14

1. No 'exchanging' **2.** Extra digit in answer **3.** Exchanging O to T

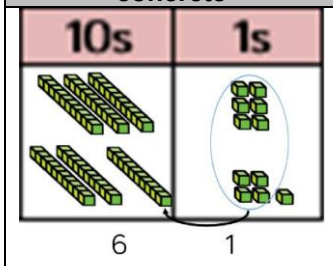
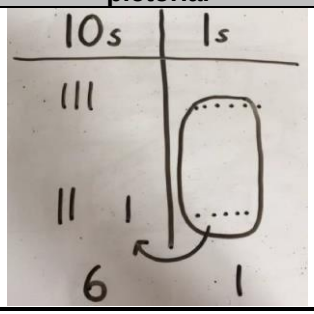
TO	HTO	TO	HTO	TO	HTO
			1	1	
23	315	94	561	47	237
+ 42	+ 624	+ 73	+ 718	+ 25	+ 516
65	939	167	1279	72	753

- Emphasise value of digit e.g. 2 tens and 3 ones
- Continue to use number lines / partitioning method using Base 10.

41 + 8 = 49

concrete	pictorial	abstract
		

36 + 25 = 61

concrete	pictorial	abstract
		TO 1 36 +25 61

Steps 15-16

4. Exchanging T to H **5.** Exchanging O to T and T to H **6.** Different no. of digits

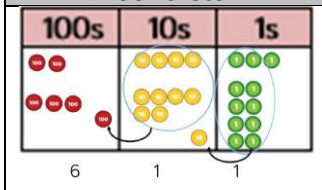
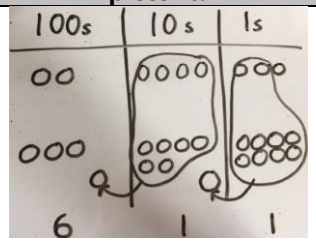
HTO	HTO	HTO
1	1 1	1 1
371	376	24
+ 485	+ 485	+ 388
856	861	412

Money and Decimals

	1		1 1
1. £3.25	**2.** £4.21		**3.** £1.85
£1.53	+ £3.87	£1.85 + 48p (written vertically)	+ 0.48
£4.78	£8.08		£2.33

- Continue to use partitioning method using Base 10 / place value counters.

243 + 368 = 611

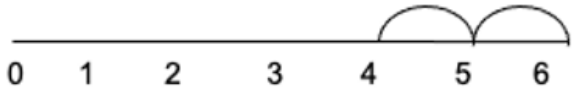
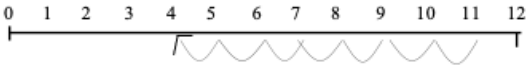
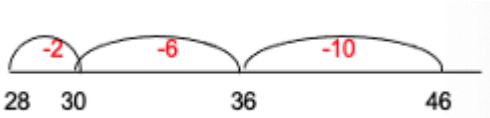
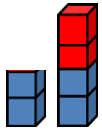
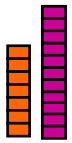
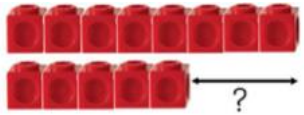
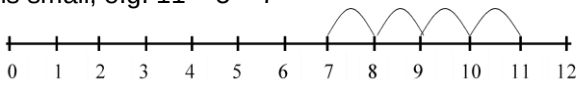
concrete	pictorial	abstract
		HTO 1 1 243 +368 611

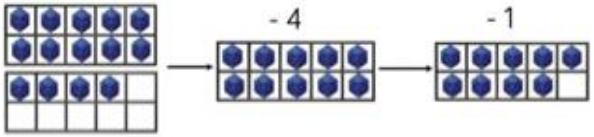
Key language: take away, less than, the difference, subtract, minus, fewer, decrease

subtraction

Strategies	Step 7	Step 8	Step 9
Subtraction using songs, pictures and real objects	Songs such as '5 little ducks went swimming one day...' or '10 green bottles' using objects  e.g. 1 less than 5 (remove 1 duck) 1 less, 2 less with pictures and numbers. We made 6 cakes. We ate 2 of them. How many cakes are left?  Using Numicon by physically removing objects from the shapes (cubes, beanbags and other items could be used as well) 		
Subtracting multiples			Subtracting multiples of 10 using Numicon or Base 10 e.g. 50 – 20 = 30

Maths Policy

Counting back	Counting back through practical activities in meaningful contexts Link to number line 6 – 2 =  	Drawing jumps on prepared lines 11 – 7 = 4  	Counting back by partitioning when numbers not close together within 50. e.g. 46 – 18 = 28 
Finding the difference	The difference between 2 and 4 	Finding the difference within 20, e.g. the difference between 7 and 11 using cubes / Numicon  Using cubes or Cuisenaire rods on number track to calculate the difference, e.g. between 8 and 5  Finding the difference by counting up when difference is small, e.g. 11 – 5 = 7  	

Related subtraction facts	Beginning to understand inverse of number bonds to 10. E.g. 10 – 8 = 2	Consolidating inverse of number bonds to 10: 10 – 3 = 7 10 – 7 = 3 Relationships / related facts 5 - 2 = □ □ = 5 - 2 5 - □ = 3 3 = □ - 2 □ - 2 = 3 3 = 5 - □ □ - □ = 3 3 = □ - □ Using ten frames e.g. 14 – 5 	Inverse bonds to 20 e.g. 20 – 18 = 2

Maths Policy

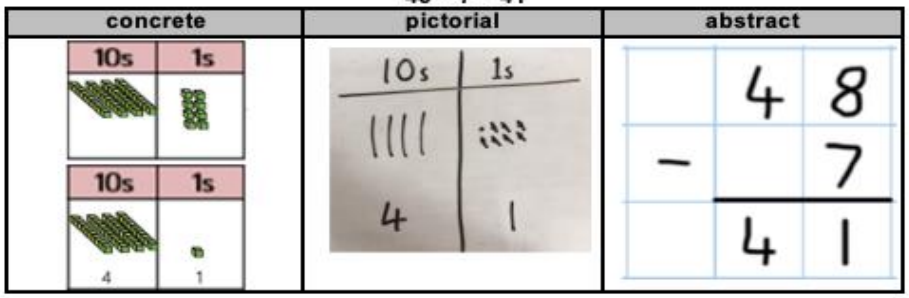
Steps 11-13

1. No exchanging **2.** Exchanging T and O **3.** Exchanging H and T

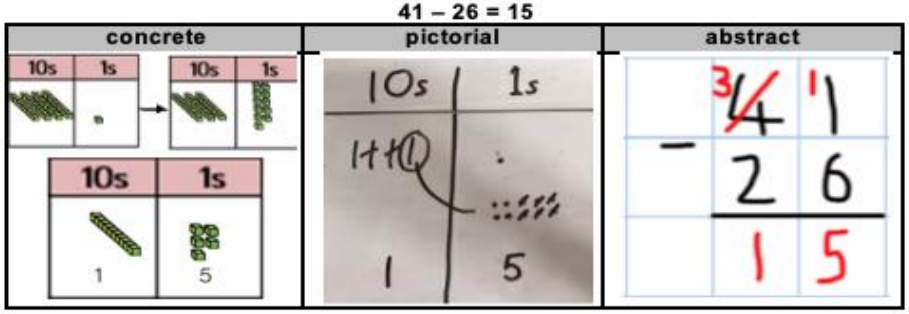
TO	HTO	T O	HTO
47	864	$^{4}\cancel{5}^{1}1$	$^{2}\cancel{3}\ ^{1}3\ 7$
- 23	- 621	- 3 6	- 1 8 2
24	243	1 5	1 5 5

- Emphasise value of digit e.g. 4 tens and 7 ones
- Continue to use number lines / partitioning method using Base 10.

48 – 7 = 41



41 – 26 = 15



Steps 14-16

4. Exchanging H to T and T to O **5.** Noughts

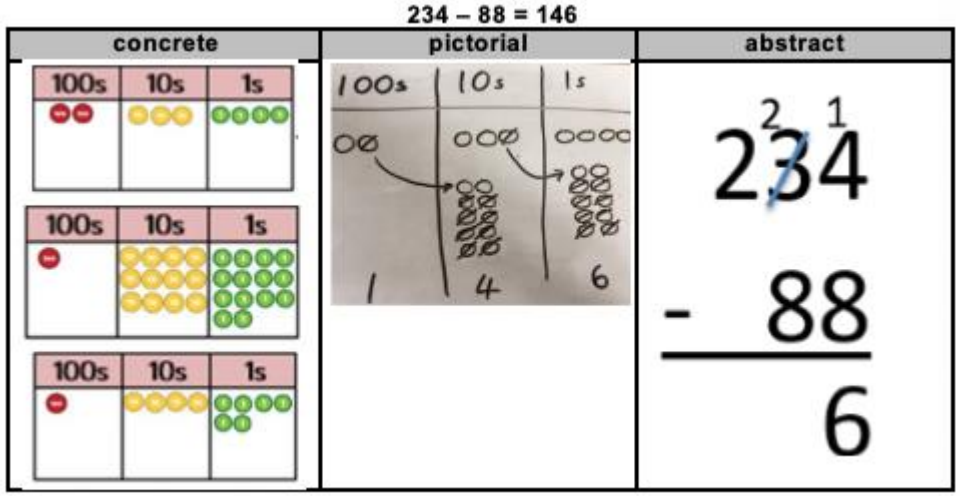
H T O	H T O	H T O	H T O
$^{3}\cancel{4}\ ^{12}\cancel{3}\ ^{1}2$	$4\ ^{6}\cancel{7}\ ^{1}0$	$^{6}\cancel{7}\ ^{9}\cancel{1}\ ^{1}0$	$^{5}\cancel{6}\ ^{9}\cancel{1}\ ^{1}4$
- 1 8 7	-1 4 2	- 4 8 5	- 3 4 7
2 4 5	3 2 8	2 1 5	2 5 7

Money and Decimals

1.	2.	3.
£4.35	£5.$^{3}\cancel{4}$5	£^{2}3.$\cancel{1}\cancel{5}\cancel{0}$
- £1.23	- £2. 2 9	- £ 1.7 3
£3.12	£3. 1 6	£ 1. 86

- Continue to use partitioning method using Base 10 / place value counters.

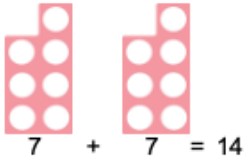
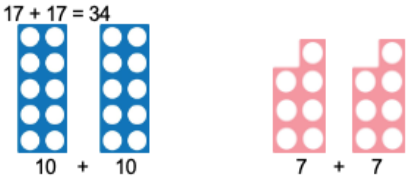
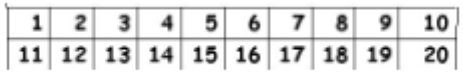
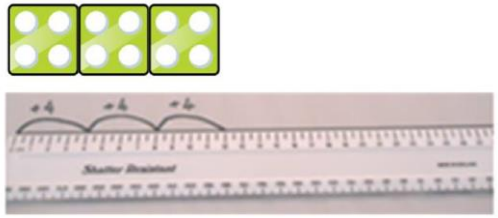
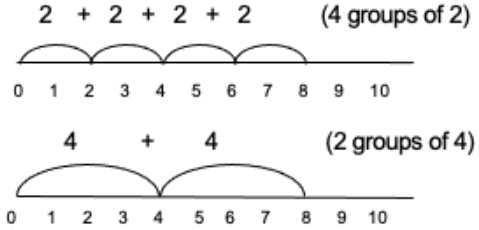
234 – 88 = 146



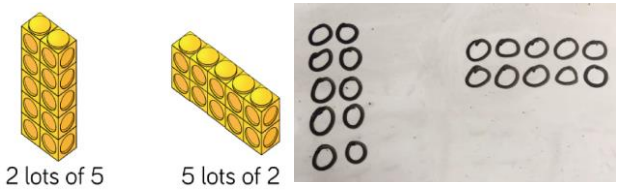
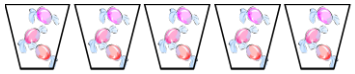
Maths Policy

Key language: double, times, multiplied by, the product of, groups of, lots of, equal groups

multiplication

Strategies	Steps 7-8	Steps 9-10	Step 11
Doubles	Doubles up to 5 + 5	Doubles up to 10 + 10 (UseNumicon)  	Doubles of all numbers up to 20 by partitioning and recombining, using Numicon or Base 10 
Knowledge of times tables	Counting in 2s and 10s (Extend to 5's)	Counting in 2s, 5s to 50 and 10s to 100 Using 100 Square up to 20 to count in 2s, 5s and 10s 	Knowing the times tables facts for 2, 5 and 10
Repeated addition	Using Numicon or Cuisenaire rods on number track 	Using number lines  	Linking to repeated addition 

Maths Policy

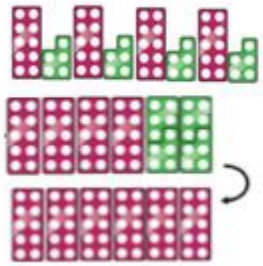
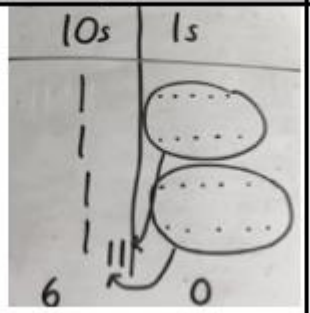
Arrays	Grouping objects in twos or threes, then adding groups of the same number 2 + 2 + 2  	Using arrays to illustrate commutativity, counters and cubes can also be used – concrete / pictorial / abstract  10=2x5 ¦ 5x2=10 ¦ 2+2+2+2+2=10 ¦ 10=5+5	Understanding multiplication as repeated addition / groups / lots. Reading arrays 
In context	In context: how many wheels do we need to make three Noddy cars? 5 + 5 + 5 = 15 	There are 2 sweets in one cup. How many sweets are there in 5 cups? 	

Maths Policy

Steps 12-13

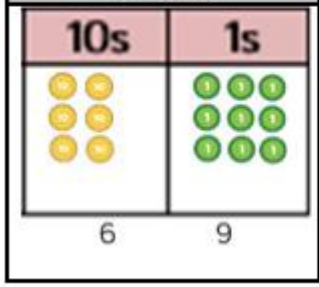
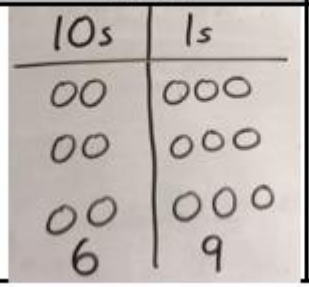
- Knowing the times tables facts for 3, 4 and 8
- Partition to multiply using Numicon, Base 10 or Cuisenaire rods on number track

4 x 15 = 60

concrete	pictorial	abstract
		4 x 15 10 5 10 x 4 = 40 5 x 4 = 20 40 + 20 = 60

- Column method with no carrying, using Numicon or place value counters

3 x 23 = 69

concrete	pictorial	abstract
		3 x 23 20 3 3 x 20 = 60 3 x 3 = 9 60 + 9 = 69 23 x 3 69

Steps 14-16

- Knowing the times tables facts up to 12 x 12, including multiplying by 0 and 1

1. No carrying

T	O
3	2
x	3
9	6

2. Extra digit

H	T	O
5	1	
x		2
1	0	2

3. Carrying

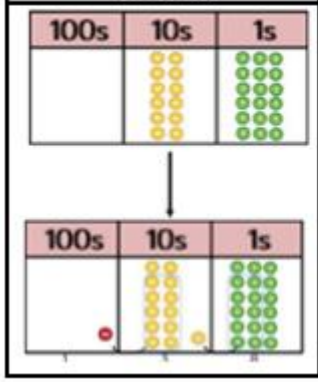
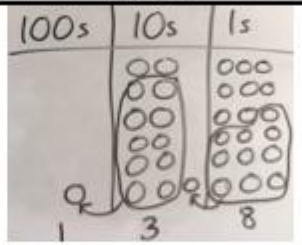
H	T	O
3	8	
x		7
2	6	6
	5	

4. Zeros

H	T	O
2	0	2
x		4
8	0	8

- Continuing to use place value counters and concrete / pictorial / abstract approach.

6 x 23 = 138

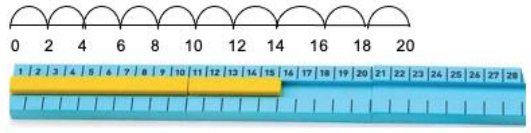
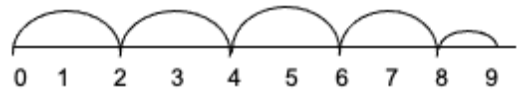
concrete	pictorial	abstract
		H T O 2 3 x 6 1 3 8 1 1

Maths Policy

Key language: share, group, equal groups, divide, divided by, half

division

Strategies	Steps 7-9	Steps 10-12	Steps 13-16
Division as sharing	Division as sharing equally Sharing 6 cupcakes between 2 people  Sharing a bag of 10 sweets between 2 children (one for you, one for me), emphasising the importance of sharing equally	Halving even numbers up to 10 using e.g. multilink cubes Understanding 8 ÷ 2 as half of 8	Halving even numbers up to 20 Halving multiples of 10 up to 100
Division as grouping	Division as grouping 10 sweets grouped into 2s. How many groups?  How many pairs of socks are there in your drawer? 	Division as groupin: 2s, 5s and 10s 15 children get into teams of 5 to play a game. How many teams are there? 	Recording using ÷ and = signs Recognising relationship between x and ÷ Knowing related division facts for 2, 5 and 10 tables Using number lines or Cuisenaire rods on number track / above ruler 20 ÷ 2 = 10 (counting in 2s)

			 Practising questions such as: How many groups of 5 in 15? (using Numicon / cubes) How many 5s have been counted? How many 5s make 20? How many more 5s do we need to get to 25?
Division with remainders			Calculations with remainders 9 ÷ 2 = 4 r1  21 ÷ 5 = 4 r 1 remainder 1