Someries Junior School Calculation Policy 2018

Addition

Year	2	3	4	5	6
Just know it!	Recall and use addition and subtraction facts up to 20 fluently	Recall and use addition and subtraction facts up to 20 fluently and derive and use related facts up to 100			
Foundations	1 more	Add multiples of 10 and 100	Add multiples of 10s, 100s, 1000s	Add multiples of 10s, 100s, 1000s, tenths	Add multiples of 10s, 100s, 1000s, tenths, hundredths
	10 more	Add single digit bridging through boundaries	Fluency of 2 digit + 2 digit	Fluency of 2 digit + 2 digit including with decimals	Fluency of 2 digit + 2 digit including with decimals
	All number bonds up to 20	Partition second number to add	Partition second number to add	Partition second number to add	Partition second number to add
	Add 1 digit to 2 digit	Pairs of 100	Decimal pairs of 10 and 1	Use number facts, bridging and place value	Use number facts, bridging and place value
	Add 10 and multiples of 10	Use near doubles to add	Use near doubles to add	Adjust numbers to add	Adjust numbers to add
	Doubles up to 20	Add near multiples of 10 and 100 by rounding and adjusting	Adjust both numbers before adding	Partition and combine	Partition and combine
		Partition and combine	Add near multiples		
			Partition and combine		

Developing conceptual understanding

Numicon

2 + 5 = 7

Number line

8 + 5 = 13
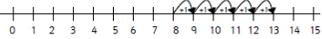
Developing understanding of partitioning and place value.

41 + 8

Rods and units

32 + 21 = 53

When the units total more than 10, exchange 10 ones for 1 ten.

45 + 38 = 40 + 5 + 30 + 8 = 40 + 30 + 10 + 3 = 83

TO + TO using base 10
(tens & ones)
Continue to develop understanding of partitioning and place value.

36 + 25
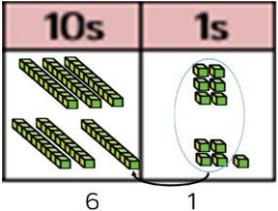
Number bonds

4 + 7 + 6 = 17

Combine the two numbers that make 10 and then add on the remainder.

Partitioning

264 + 158

200 + 100 = 300
60 + 50 = 110
4 + 8 = 12

300 + 110 + 12 = 422

Number line

264 + 158

Starting with the larger number, adding hundreds, then tens and adding ones last.

Diennes apparatus

264 + 158

Developing an understanding of equality.

6 + □ = 11

6 + 5 = 5 + □

6 + 5 = □ + 4

Year	2	3	4	5	6
	Bar model ? 21 | 34 ? 185 | 315				
Written methods	Add two 2-digit numbers, using concrete objects, pictorial representations progressing to formal written methods. 46 + 27 ‾‾‾ 73	Add numbers with up to 3 digits, using formal methods of columnar addition 423 + 88 ‾‾‾ 51 1 _{1 1}	Add numbers with up to 4 digits, using formal methods of columnar addition where appropriate 2458 + 596 ‾‾‾ 3054 _{1 1 1}	Add numbers with more than 4 digits and decimals with …. places, using formal methods of columnar addition 23454 23.70 + 3596 + 48.56 ‾‾‾‾‾‾‾‾‾‾‾ 26050 72.26	Adding numbers with up to 7 digits and decimals with up to 3 decimal places , using formal methods of columnar addition 456 287 +359 849 ‾‾‾‾‾‾ 816 136 _{1 1 1 1 1} 23.900 19.850 +7.361 ‾‾‾‾ 51.1 1 1 _{2 2 1}

Subtraction

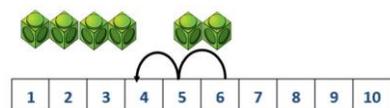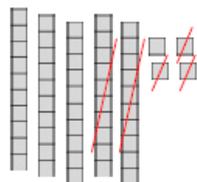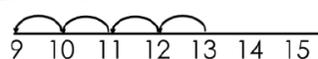| Year	2	3	4	5	6
Just know it!	Recall and use subtraction facts up to 20 fluently, and derive and use related facts up to 100.				
Foundations	1 less	Subtract multiples of 10 and 100	Subtract multiples of 10s, 100s and 1000s	Subtract multiples of 10s, 100s and 1000s, tenths	Subtract multiples of 10s, 100s and 1000s, tenths, hundredths
	10 less	Subtract single digit by bridging	Fluency of 2 digit subtract 2 digit	Fluency of 2 digit subtract 2 digit including with decimals	Fluency of 2 digit subtract 2 digit including with decimals
	Subtraction number bonds up to 20	Partition second number to subtract	Partition second number to subtract	Partition second number to subtract	Partition second number to subtract
	Subtract 1 digit from 2 digit by bridging	Subtract near multiples of 10 and 100 by rounding and adjusting	Decimal subtraction from 10 and 1	Adjust numbers to subtract	Use number facts bridging and place value
	Partition second number, count back in 10s and 1s	Difference between	Subtract near multiples by rounding and adjusting	Difference between	Adjust numbers to subtract
	Subtract 10 and multiples of 10		Difference between		Difference between
	Subtract near multiples of 10				
	Difference between				
Developing conceptual understanding	**Numicon** $10 - 3 = 7$ **Number line – counting back** $6 - 2 = 4$ **Rods and units** $54 - 23 = 31$	**Number line - counting back** $13 - 4 = 9$ 9 10 11 12 13 14 15 $57 - 23 = 34$ -1 -1 -1 -10 -10 34 35 36 37 47 57	**Diennes apparatus – exchanging** $41 - 26$ 10s 1s → 10s 1s 10s 1s 1 5	**Number line** – finding the difference/counting on from the smaller number to the larger number	
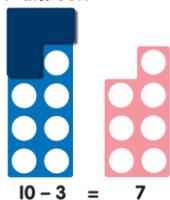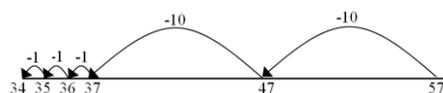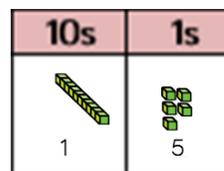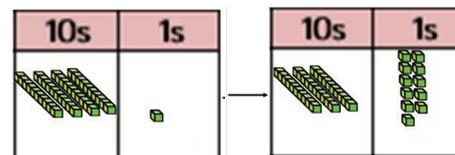
Year	2	3	4	5	6
Bar Model	Bar model 				
Written methods	Subtract two 2-digit numbers, using concrete objects, pictorial representations progressing to formal written method 73 - 46 27	Subtract with up to 3 digits, using formal written methods of columnar subtraction 344 - 187 157	Subtract with up to 4 digits, using formal written methods of columnar subtraction 2344 - 187 2157	Subtract whole numbers with more than 4 digits and decimals, using formal written methods of columnar subtraction 46 291 66.23 - 29 354 -45.86 47 937 17.37	Subtract whole numbers with up to 7 digits and decimals with up to 3 decimal places, using formal written methods of columnar subtraction 746 291 63.230 -298 354 -45.869 447 937 17.361

Multiplication

Year	2	3	4	5	6
Just know it!	Recall and use x facts for 2, 5 and 10 times tables	Recall and use facts for 2,3,4, 5, 8 and 10 times tables	Recall and use facts for times tables up to 12 x 12	Recall prime numbers up to 19 Recognise and use square and cube numbers	
Foundations	Recognise odd and even numbers	Review 2, 5 and 10 times tables	Review 3, 4 and 8 times tables	Review and use facts for table up to 12 x 12	Multiplication facts up to 12 x 12
	2, 5 and 10 times tables	3, 4, 8 times tables	6,7, 9,11 and 12 times tables	Double 4-digit numbers and larger numbers	Partition to multiply mentally
	Count in 3s	Double 2-digit numbers	Double 3-digit numbers	Double decimals	Double larger numbers
	Doubles up to 20 and multiples of 5		Double some decimals	Partition to multiply mentally	Double decimals up to 3 decimal places
			10 times bigger	100, 1000 times bigger	

Developing conceptual understanding

Numicon
3 x 4

Number line
$5 \times 3 = 5 + 5 + 5$
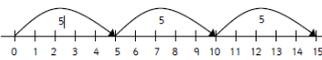
Numicon
4 x 15

Array
4 x 9
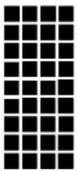
9 x 4

Diennes
23 x 2

$23 \times 2 = 23 + 23 = 46$

Partitioning
23 x 8
$20 \times 8 = 160$
$3 \times 8 = 24$
$160 + 24 = 184$

Partitioning for decimals
2.35 x 8
$2 \times 8 = 16$
$0.3 \times 8 = 2.4$
$0.05 \times 8 = 0.4$
$16 + 2.4 + 0.4 = 18.8$

Bar model

| 5 | 5 | 5 | 5 |

| 23 | 23 | 23 | 23 | 23 | 23 |

Year	2	3	4	5	6
Written methods	Calculate mathematical statements for multiplication within the multiplication tables and write them using the x sign and = sign	Write and calculate the mathematical statements for x tables , progressing to formal written methods	Multiply 2-digit and 3-digit numbers by a 1-digit number, using the formal written method $6 \times 23 =$ $\begin{array}{r} 23 \\ \times\ \ 6 \\ \hline 138 \\ \hline \scriptstyle 1\ \ 1 \end{array}$	Multiply numbers up to 4-digit numbers by 1-digit or 2-digit number, using a formal written method (short and long multiplication)	Multiply multi-digit numbers up to 4-digit numbers by 2-digit numbers and multiply whole numbers by decimals up to 2 decimal places $\begin{array}{r} 1\ \ 2\ \ 4 \\ \times\ \ \ \ \ \ 2\ \ 6 \\ \hline 7\ \ 4\ \ 4 \\ 2\ \ 4\ \ 8\ \ 0 \\ \hline 3\ \ 2\ \ 2\ \ 4 \\ \hline \scriptstyle 1\ \ \ 1 \end{array}$ Answer: 3224

Division

Year	2	3	4	5	6
Just know it!	Recall and use x and ÷facts for 2, 5 and 10 times tables	Recall and use x and ÷ facts for 2,3,4, 5, 8 and 10 times tables	Recall and use x and ÷ facts for times tables up to 12 x 12	Recall prime numbers up to 19 Recognise composite numbers	
Foundations	Recognise odd and even numbers	Review division facts for 2, 5 and 10 times tables	Review division facts for 3, 4 and 8 times tables	Review and use x and ÷ facts for table up to 12 x 12	Division facts up to 12 x 12
	Division facts for 2, 5 and 10 times tables	Division facts for 3, 4, 8 times tables	Division facts for 6,7, 9,11 and 12 times tables	Halve 4-digit numbers and larger numbers	Partition to divide mentally
	Count back in 3s	Halve 2-digit numbers	Halve 3-digit numbers	Halve decimals	Double larger numbers
	Halves up to 20		Halve some decimals	Partition to divide mentally	Double decimals up to 3 decimal places
			10 times smaller	100, 1000 times smaller	

Developing conceptual understanding					

Numicon

12 ÷ 4

Sharing

6 ÷ 2

If 6 sweets are shared between 2 people, how many do they each get?
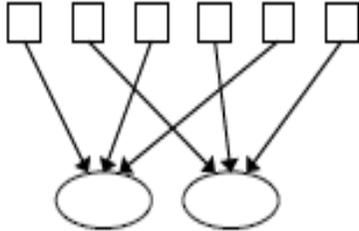
Grouping

Grouping or repeated subtraction
If there are 6 sweets, how many people can have 2 sweets each?

Bar model

6 ÷ 2 = 3

3	3

Number line

-2 -2 -2
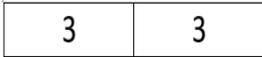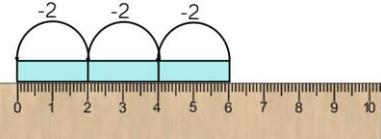
3 groups of 2

13 ÷ 4 – 3 remainder 1
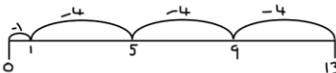
Diennes

44 ÷ 4 = 11

Part – Whole model

615 ÷ 5

615
500 100 15
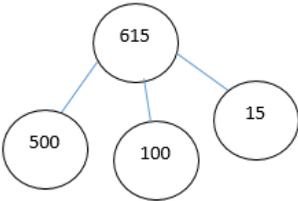
Using place value, partitioning and known facts.

42 ÷ 3
42 = 30 + 12
30 ÷ 3 = 10
12 ÷ 3 = 4
10 + 4 = 14

Year	2	3	4	5	6

Written methods	Calculate mathematical statements for division within the multiplication tables and write them using the ÷ and = signs	Write and calculate mathematical statements for ÷ using the x tables, progressing to formal written methods	Divide 2-digit and 3-digit numbers by 1-digit number, using the formal method of short division
			
			98 ÷ 7 432 ÷ 5
			98 ÷ 7 becomes
			
			   1 4
			7
				9² 8
				
				Answer: 14
				
				432 ÷ 5 becomes
				
				   8 6 r2
				5
					4 3³ 2
					
					Answer: 86 remainder 2
						Divide numbers up to 4-digit numbers by 1-digit number, using the formal method of short division and interpret remainders appropriately
						
						  123
						5
							6¹1¹5	Divide numbers up to 4-digits by 2-digit whole number, using the formal written method of short and long division; interpret remainders as fractions/decimals up to 2 decimal places.
								
								496 ÷ 11
								
								   4 5 r1
								11
									4 9⁵ 6
									
									Answer: $45\frac{1}{11}$
									
									432 ÷ 15 becomes
									
									    2 8 · 8
									15
										4 3 2 · 0
										   3 0 ↓
										   1 3 2
										   1 2 0 ↓
										     1 2 0
										     1 2 0
										        0

To be reviewed and ratified at the FGB Curriculum Committee – 10 July 2018
Review: 2020