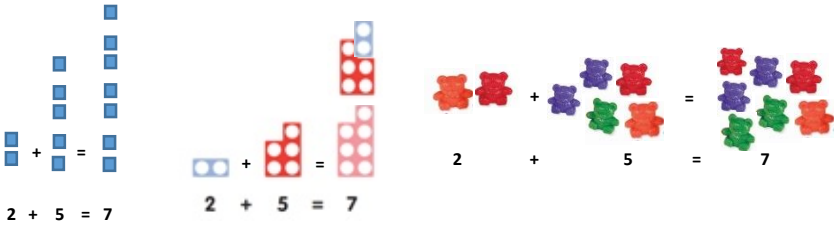
Redfield Edge Primary School

Key Stage 1 Addition and Subtraction Calculation Policy

Addition EYFS

Pictorial

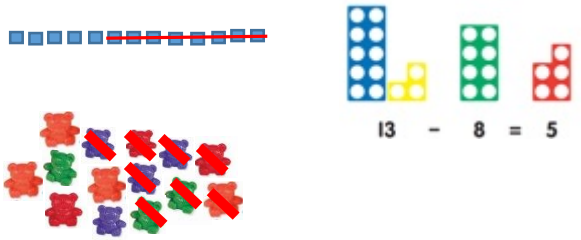


Manipulatives

Counters
Numicon
Multi-link
Compare bears
Fingers
Any objects

Subtraction EYFS

Pictorial



Addition Year 1

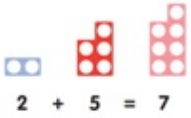
Pictorial

2 people are on the bus. 5 more get on at the next stop. How many people are on the bus now?

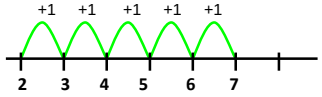
[Might be recorded as: 2 + 5 = 7]

Cubes/counters/dots/multi-link:

Numicon:



Abstract



Manipulatives

Counters
Number lines
Numicon
Multi-link
Compare bears
Fingers

Subtraction Year 1

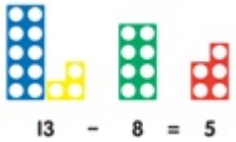
Pictorial

Mum baked 13 biscuits. I ate 8. How many were left?

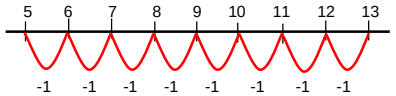
[Might be recorded as: *13 – 8 = 5*]

Cubes/counters/dots/multi-link:

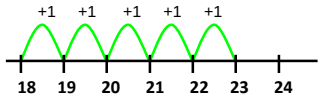
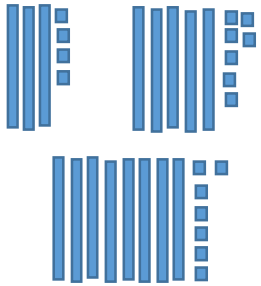
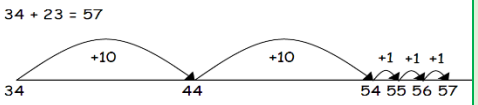
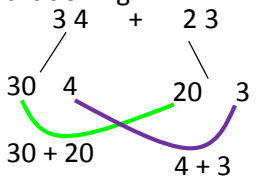
Numicon:



Abstract

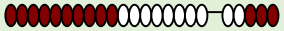


Addition Year 2

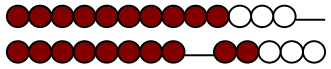
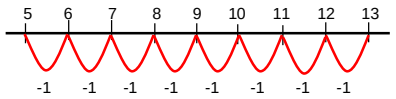
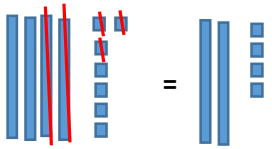
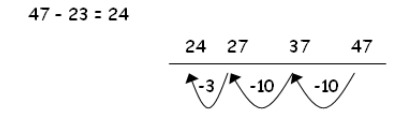
Pictorial	Abstract
18 + 5 = 23	
Beads: 	Number line: 
34 + 23 = 57	
Dienes: 	Number line:  Partitioning: 

Manipulatives

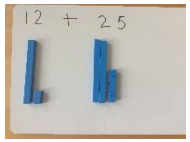
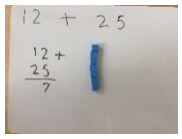
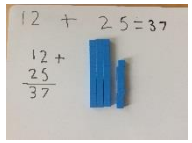
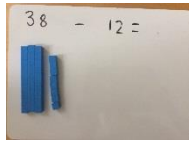
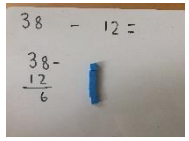
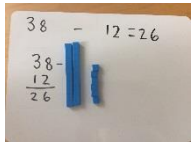
Counters
Number lines
Numicon
Multi-link
Dienes
Stringed beads



Subtraction Year 2

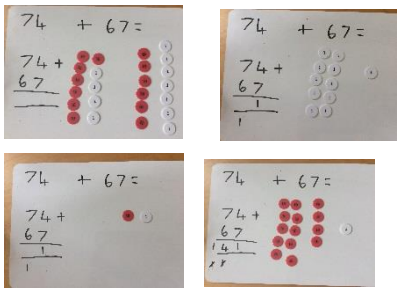
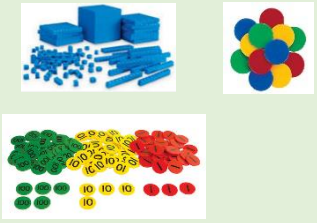
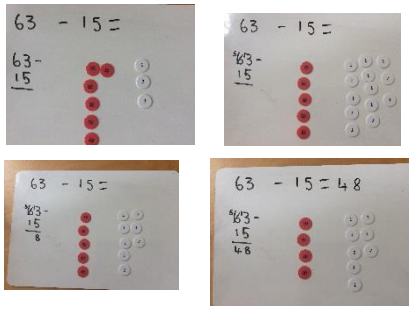
Pictorial	Abstract
13 – 8 = 5	
Beads: 	Number line: 
47 – 23 = 24	
Dienes: 	Number line: 

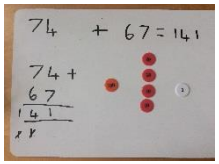
Introduced by the end of Year 2

12 + 25 = 37		
  	**Column Addition** Model partitioning for expanded written method first. 12 + 25 = 7 + 30 = 37 18 + 25 = 13 + 30 = 43	Dienes 
38 – 12 = 26		
  	**Column Subtraction** Model partitioning for expanded written method first. 38 − 12 = 6 + 20 = 26	

Redfield Edge Primary School

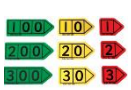
Key Stage 2 Addition and Subtraction Calculation Policy

Addition Year 3		Manipulatives	Subtraction Year 3	
Pictorial	Abstract		Pictorial	Abstract
12 + 25 = 37		Counters Dienes Place Value Counters Place Value Cards	38 – 12 = 26	
	Column Addition - Expand to include decimals Model partitioning for expanded written method first. 12 + 25 = 7 + 30 = 37 18 + 25 = 13 + 30 = 43			**Column Subtraction-** Expand to include decimals Model partitioning for expanded written method first. 38 − 12 = 20 + 6 = 26
Introduced by the end of Year 3				
18 +25 = 43	43 + 91 = 134	Counters Dienes Place Value Counters Place Value Cards	38 – 12 = 26	63 – 15 = 48
	**Column Addition** - Use the language of carrying 18 + 25 = 43 43 + 91 = 134 74 + 67 = 141			**Column Subtraction-** Use the language of carrying 38 − 12 = 26 63 − 15 = 48 523 − 59 = 464



Decimals:

$$\begin{array}{r} 3.5 \\ +2.4 \\ \hline 5.9 \end{array} \qquad \begin{array}{r} 5.6 \\ +8.1 \\ \hline 13.7 \\ {\scriptstyle 1} \end{array} \qquad \begin{array}{r} 8.6 \\ +5.8 \\ \hline 13.4 \\ {\scriptstyle 1\ 1} \end{array}$$



Decimals:

$$\begin{array}{r} 6.7 \\ -2.4 \\ \hline 4.3 \end{array} \qquad \begin{array}{r} {\scriptstyle 3} \\ 4.{\scriptstyle 1}5 \\ -2.8 \\ \hline 1.7 \end{array} \qquad \begin{array}{r} {\scriptstyle 6\ 2} \\ 7.{\scriptstyle 1}{\scriptstyle 1}0 \\ -4.73 \\ \hline 2.57 \end{array}$$

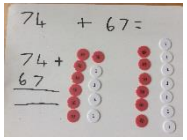
Column Subtraction-
(with multiple 0s)

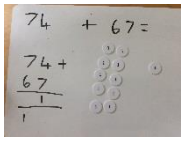
$$\begin{array}{r} {\scriptstyle 2\ 9\ 9} \\ 3{\scriptstyle 1}0{\scriptstyle 1}{\scriptstyle 1}0 \\ -\ 697 \\ \hline 2303 \end{array}$$

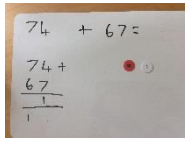
Addition
Year 4, 5, 6

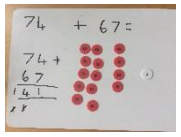
Pictorial

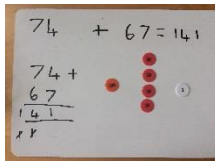
18 +25 = 43











Abstract

43 + 91 = 134

74 + 67 = 141

Column Addition -

Use the language of carrying

18	43	74
+ 25	+ 91	+ 67
43	134	141
1	1	1 1

Decimals:

3 . 5	5 . 6	8 . 6
+ 2 . 4	+ 8 . 1	+ 5 . 8
5 . 9	13 . 7	1 3 . 4
	1	1 1

Manipulatives

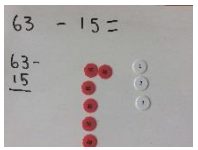
Counters
Dienes
Place Value Counters
Place Value Cards

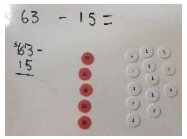
Subtraction
Year 4, 5, 6

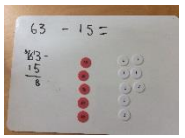
Pictorial

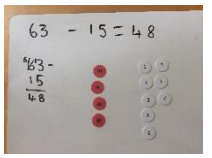
38 – 12 = 26

63 – 15 = 48









Abstract

523 – 59 = 464

Column Subtraction-

Use the language of carrying

	5	4 1
3 8	6 1 3	5 1 2 1 3
- 1 2	- 1 5	- 5 9
2 6	4 8	4 6 4

Decimals:

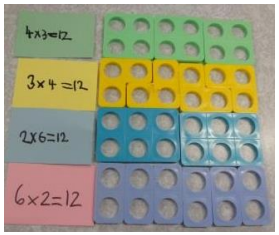
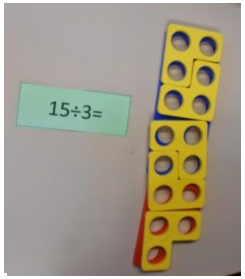
	3	6 2
6 . 7	4 . 1 5	7 . 1 3 0
- 2 . 4	- 2 . 8	- 4 . 7 3
4 . 3	1 . 7	2 . 5 7

Column Subtraction-
(with multiple 0s)

	2 9 9
3 0 0 0	1 1 1 1
- 6 9 7	
2 3 0 3	

Redfield Edge Primary School

Key Stage 1 Multiplication and Division Calculation Policy

Multiplication EYFS	Manipulatives	Division EYFS
Pictorial		Pictorial
Symbols/pictures/objects 3 lots of 2 counters = 3 x 2   	Counters Numicon Multi-link Compare bears Fingers Any objects    	Symbols/pictures/objects 4 sticks shared between 2 children.  Sharing: share these bears between 4 people  

Multiplication Year 1

Pictorial	Abstract

Manipulatives

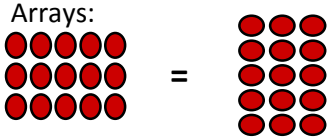
Division Year 1

Pictorial	Abstract

5 x 3 = 15 or 3 x 5 = 15 (commutative law*)

6 ÷ 3 = 2 15 ÷ 5 = 3

Arrays:

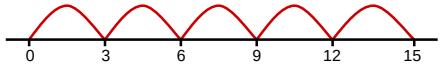


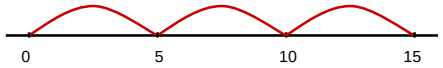
5 x 3 = 3 x 5

Numicon:

Dots/counters/cubes:

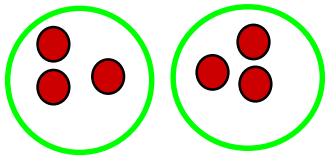
Repeated addition / number lines:



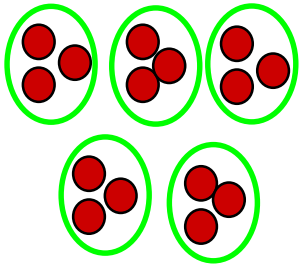


Counters
Number lines
Numicon
Multi-link
Compare bears
Fingers

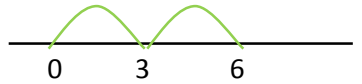
Grouping counters:

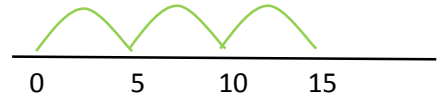


Sharing counters:



Repeated addition / number lines



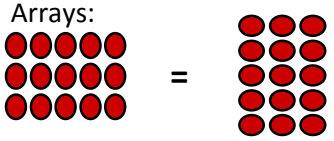


Multiplication Year 2

Pictorial

5 x 3 = 15 or 3 x 5 = 15 (commutative law*)

Arrays:

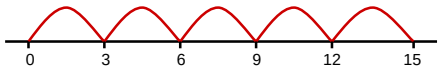


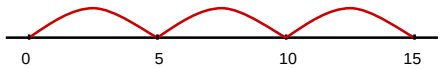
5 x 3 = 3 x 5

Numicon:

Dots/counters/cubes:

Repeated addition / number lines:





Abstract

Manipulatives

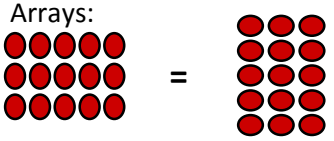
Counters
Number lines
Numicon
Multi-link
Compare bears
Fingers

Division Year 2

Pictorial

6 ÷ 3 = 2 15 ÷ 5 = 3

Arrays:



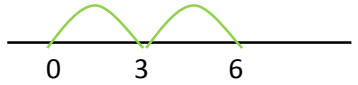
5 x 3 = 3 x 5

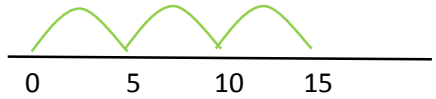
Numicon:

Dots/counters/cubes:

Abstract

Repeated addition / number lines:



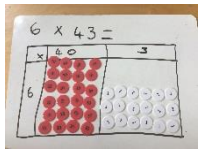
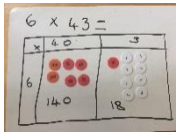
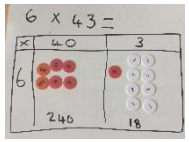
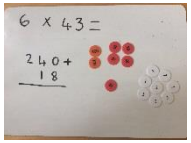
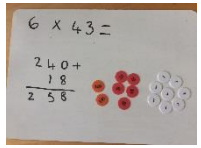
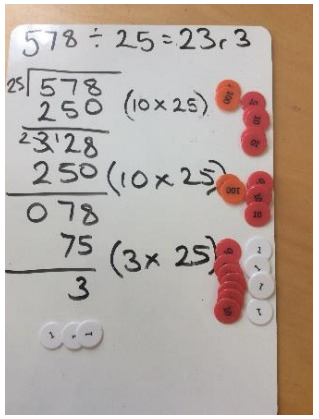


- Commutative Law: where the numbers can be in any order and still produce the same answer
  e.g. 6 x 5 = 30 5 x 6 = 30

  4 + 9 = 13 9 + 4 = 13

Redfield Edge Primary School

Key Stage 2 Multiplication and Division Calculation Policy

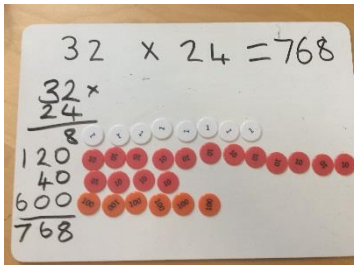
Multiplication Year 3		Manipulatives	Division Year 3	
Pictorial	Abstract		Pictorial	Abstract
43 x 6 = 258		Counters Dienes Place Value Counters Place Value Cards	36 ÷ 3 = 12	
    	**Short Multiplication** – ensure pupils can partition into tens and ones before introducing grid Expand to include decimals (times tables are crucial for this method) Grid: x | 6 40 | 240 3 | 18 | 258	    		**Long** method – chunking then move to compact Expand to include decimals Expanded (times tables are crucial for this method) 1 2 3 | 3 6 3 0 6 6 0

By the end of Year 3 introduce expanded multiplication in Year 4 section

Multiplication Year 4

Pictorial	Abstract

32 x 24 = 768



Long Multiplication
Expand to include decimals
(times tables are crucial for this method)
Expanded:

```
  32
  24 x
 ----
   8
 120
  40
 600
 ----
 768
```

Progressing onto compact:

```
  32
  24 x
 ----
 128
 640
 ----
 768
```

Order of calculation
u x u (4x2)
u x t (4x3)
t x u (2x2)
t x t (2x3)

Manipulatives

Counters
Dienes
Place Value Counters
Place Value Cards





Division Year 4

Pictorial	Abstract

570 ÷ 5 = 114

Short Method (for number divide by a 1 digit number)
Expand to include decimals
Use the language of exchanging
(times tables are crucial for this method)

$$5\overline{)5\,7^{2}0}\quad 1\,1\,4$$

Multiplication
Year 5 and 6

Abstract

32 x 24 = 768

Long Multiplication
Expand to include decimals
(times tables are crucial for this method)

```
  32
  24 x
 ----
 128
 640
 ----
 768
```

Order of calculation
u x u (4x2)
u x t (4x3)
t x u (2x2)
t x t (2x3)

9.3 x 54 = 483.6 (decimals)

```
   9.3
 x  5 4
 -------
   3 7 2
 4 6 5 0
 -------
 5 0 2.2
```

1) Line up the two numbers forgetting about the PV columns
2) Pretend the decimal point(s) aren't there and treat them as whole numbers.
3) Work out exactly the same way as if they were whole numbers.
4) Vertically add the numbers generated.
5) Count how many numbers are to the right of the decimal in the original multiplication (the 3 therefore 1 number).
6) Then put a decimal place back into your answer, depending on how many you counted in step 5 (in the instance it's 1). Counting from the right.

Manipulatives

Counters
Dienes
Place Value Counters
Place Value Cards





Division
Year 5 and 6

Abstract

570 ÷ 5 = 114

Short Method *(for number divide by a 1 digit number)*
Expand to include decimals
Use the language of exchanging
(times tables are crucial for this method)

```
    1 1 4
  ---------
5 | 5 7 2 0
```

684 ÷ 19 = 36

Long method *(for number divide by a 2 digit number)*
Expand to include decimals
Expanded
(times tables are crucial for this method)

```
        3 6
      -------
19 |  6 8 4
     1 9 0    (10 x 19)
     -------
     4 9 4
     3 8 0    (20 x 3)
     -------
       1 1 4
         9 5  (5 x 19)
       -------
         1 9
         1 9  (1 x 19)
       -------
         0 0
```

For videos to help with manipulatives and method go to:

https://www.youtube.com/user/NCETM