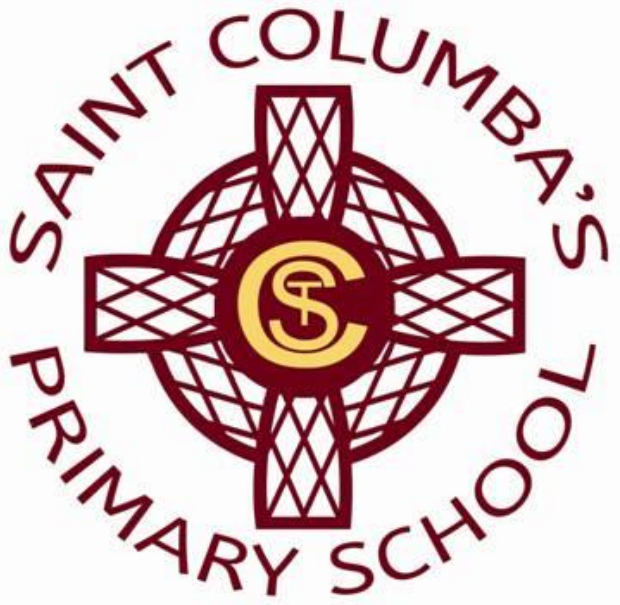


St Columba's Catholic Primary School

Whole School Mathematics

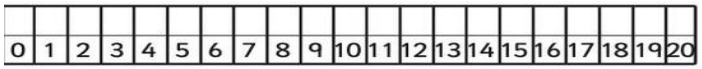
Calculation Policy

Year 1

Add

Via practical activities, Y1 pupils learn to add two numbers together (aggregation), then learn to add on to a number (augmentation)

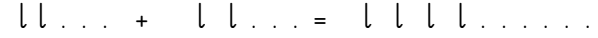
Autumn term:



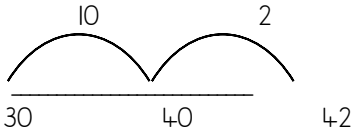
Counting along a number track

Spring term: Introduce the concept of 10s and 1s

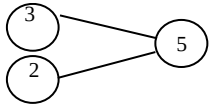
Summer term: 23 + 23 = 46 is shown as



30 + 12 = 42 on a number line



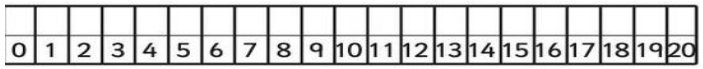
Party-part-whole model is crucial:



Subtract

Via practical activities, Y1 pupils learn to subtract one number from another, and are shown that subtraction is the inverse of addition

Autumn term:

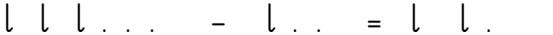


Counting back along a number track

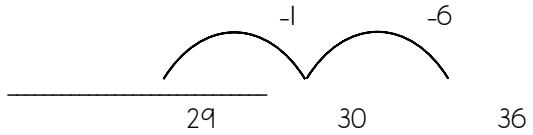
Physically taking away • • • ⁄ ⁄ for 5 – 2 = 3

Spring term: Introduce the concept of 10s and 1s

Summer term: 33 – 12 = 21 is shown as

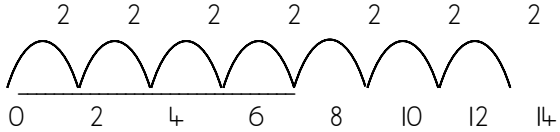


36 – 7 = 29 is shown as



Multiply

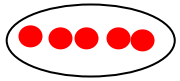
* count in 2s 5s 10s
* group objects into 2s 5s 10s and count
* use NUMICON to show 3 x 2 = 6 (say "three two times")
* show multiplication as repeated addition

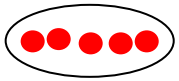


Divide

Practical activities to share out things equally, leading to pictorial representations. For example:

10 -:- 2 = 5 (say "10 shared by/between 2")





In Y1, use SHARING rather than GROUPING

Year 2

Add

10s and 1s set out in columns

33 + 44 = 77 looks like this

10s	1s
III	. . .
IIII	. . . .
70	+ 7

As soon as pupils are secure with this, they can set out additions in columns like this:

$$\begin{array}{r} 33 \\ +\ 44 \\ \hline \end{array}$$

Subtract

10s and 1s set out on columns grid

Show subtraction by crossing out,
so that 45 - 11 = 34 looks like

T	U
III~~I~~	~~/~~. . . .

Subtractions like 45 - 36 which involve decomposition are introduced with Dienes (Base 10) apparatus as a problem-solving activity.

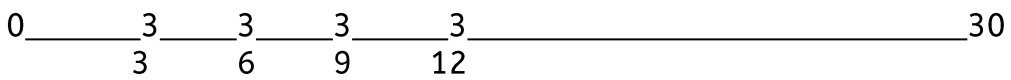
Multiply

Count in 2s 3s 5s 10s

Use arrays to show that 4 x 2 is also 2 x 4

. . . .
. . . .

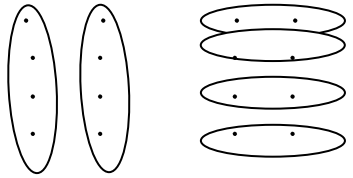
Use number lines to show "three four times"



Divide

Sharing AND grouping taught first in Y2

Use arrays to show 8 -:- 4 = 2



Introduce remainders: 7 -:- 3 = 2 r1

Year 3

Add

For mental calculations, an expanded method can be taught:

44 + 33 = 77

40 + 30 = 70
4 + 3 = 7

The written method builds on the column method taught in Y2

a) 44
+33
77

b) 44
+37
81
1

c) 444
+377
781
11

Carry and cross out

Subtract

All subtraction work is underpinned by practical activities with Base 10 apparatus

For mental calculations, an expanded method can be taught:

53 - 41 = 12

50 - 40 = 10
3 - 1 = 2

This will not become the pupils' standard written method because column subtraction will be introduced

5 3
-4 1
1 2

5 1
6 3
- 4 4
1 9

Multiply

Times tables: 2x 5x 10x
3x 4x 6x

15 x 3 is shown as 10 x 3 = 30 add
5 x 3 = 15

Divide

30 -:- 5 = 6 BECAUSE 6 x 5 = 30

Prove these links with arrays and with sharing AND grouping

Year 4

Add

By the end of Y4 pupils will calculate 763 + 179 using the standard column method

```
  7 6 3
+ 1 7 9
-------
  9 4 2
-------
  1 1
```

Subtract

Use Base 10 apparatus to show...

879 - 137 is 800 - 100 = 700
70 - 30 = 40
9 - 7 = 2

This leads quickly to...

371 - 118

```
    6 1
  3 7 1
- 1 1 8
-------
  2 5 3
-------
```

Multiply

15 x 9 Partitioning is used to show 10 x 9 = 90
+ 5 x 9 = 45
135

This leads quickly to the standard column method...

```
    1 5
  X   9
-------
  1 3 5
-------
    4
```

Carried digits

Divide

Model the chunking method with Base 10 apparatus AND place value counters

98 -:- 6 = 16 r 2

```
6 ) 9 8
    6 0    (10 x 6)
    3 8
    3 6    (6 x 6)
      2
```

Moving quickly on to

```
    1 6 r 2
    ---
6 ) 9 8
  3
```

Year 5

Add

4- and 5-digit numbers to 2 decimal places…estimate first

5432 + 123.45 + 87.6

```
  5432.00   <-- add zeros
+  123.45
+   87.60
--------
  5643.05
    1 1 1   <-- carried digits
```

Subtract

4- and 5-digit numbers to 2 decimal places…estimate first

1) 54321 - 19191

```
    4 1 2 1
    5 4 3 2 1   <-- steal
  - 1 9 1 9 1
```

2) Make sure pupils understand this next step before Proceeding:-

100 - 10 = 90

1000 - 10 = 990

10,000 - 10 = 9,990

3)

```
    4 9 9 9 1
    5 0,0 0 0
  - 1 9,1 9 1
```

Multiply

4-digits x 1-digit…..estimate first

1234 x 5 and 123.45 x 5

```
   1234
X     5
------
   6170
   1 1 2   <-- carry and cross out
```

Divide

1234 -:- 5 written method underpinned by work with place value counters

```
    0 2 4 6   r4/5 or r4 depending on context
    -------
    1 2 3
5) 1 2 3 4
```

Place value counters used to model decimal remainders

Year 6

Add

As for Y5 but with 6- and 7-digit numbers
Including to 3 decimal places

Subtract

As for Y5 but with 6- and 7-digit numbers
Including to 3 decimal places

Multiply

1234 x 56.....estimate first

partition

1) 1234 x 50 = 12340

X 5

aaaa

2) 1234 x 6 = 1234

X 6

bbbb

3) aaaa

+ bbbb

Divide

Divide numbers up to 4-digits by 1- and 2-digit numbers

3926 -:- 13 = ...estimate first

```
   3 0 2
     2
13) 3 9 2 6
```

13x table
13
26
39
52

carry