

Churchfields' Calculation Policy Addition

EYFS

Mental methods

Children use a variety of concrete and pictorial representations to :

- Count
- Subitise (recognise the number of objects in a group without counting)
- Find one more/less
- Find number bonds
- Combine groups of numbers

Describe addition number sentences in different ways “five add three is eight” “eight is three plus five”

Written methods

Children record in pictures, words or symbols and can relate different representations to each other. Children form numbers correctly.

Year 1/2

Mental methods

Counting and combining

Combining two sets of objects (aggregation) which will progress onto adding on to a set (augmentation). Understand that this can be done in any order (commutative).



Using a number line, number track or bead string

Children progress from a number line with every number shown to number lines with significant numbers shown.

Using a number square

Count on in tens and ones

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Number bonds

Learn number bonds and related addition and subtraction facts to 20

Use these to find related facts to 100

Partition and recombine

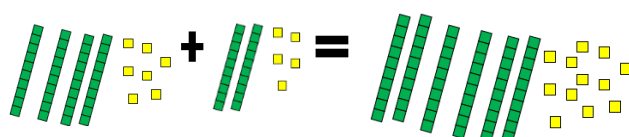
Partitioning in different ways and recombine

47+25

47

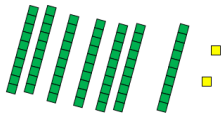
25

60 + 12



Leading to exchanging:

72

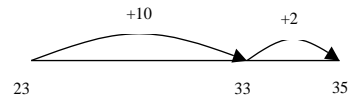


Written methods

Number line

Counting on in tens and ones

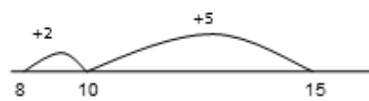
$$\begin{aligned} 23 + 12 &= 23 + 10 + 2 \\ &= 33 + 2 \\ &= 35 \end{aligned}$$



Partitioning and bridging through 10.

The steps in addition often bridge through a multiple of 10
e.g. Children should be able to partition the 7 to relate
adding the 2 and then the 5.

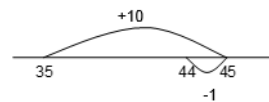
$$8 + 7 = 15$$



Adding 9 or 11 by adding 10 and adjusting by 1

e.g. Add 9 by adding 10 and adjusting by 1

$$35 + 9 = 44$$



Expanded written method

This will be supported with Dienes and place value counters with children encouraged to show their working vertically

$$\begin{array}{r} 40 + 7 \\ + 20 + 5 \\ \hline 60 + 12 = 72 \end{array}$$

Year 3/4

Mental methods

Use a number line mentally to partition and bridge numbers through 10

Round numbers to the nearest 10 and adjust e.g. $57 + 21 = 57 + 20 + 1$

Count on by partitioning the second number only e.g. $74 + 32 = 74 + 30 + 2$

Use understanding of place value to add multiples of 100 and 10 to any 3 digit number e.g. $345 + 40 = 385$

Written methods

Introduce expanded column addition modelled with place value counters or Dienes blocks

			$200 + 40 + 7$
			$100 + 20 + 5$
			$300 + 60 + 12 = 372$

247
+125

12
60
300

372

Leading to children understanding the exchange between tens and ones.

			→			

Compact written method – for numbers up to four digits.

7	1	5	1

2634
+4517

7151
1 1

Year 5/6

Mental methods

Build on methods from Y3/4 extending to larger numbers and decimals

Written methods

Children add large numbers and decimals using the compact written method, including different numbers of decimals

Subtraction

EYFS

Mental methods

Children use a variety of concrete and pictorial representations to :

- Take away
- Find out how many are left

Read number sentences aloud in different ways “five subtract one leaves four” “four is equal to five subtract one”

Written methods

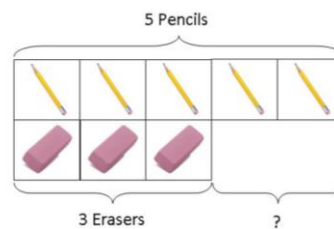
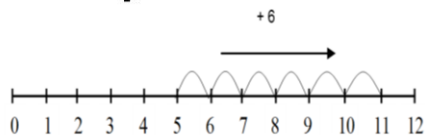
Children record in pictures, words or symbols

Year 1/2

Mental methods

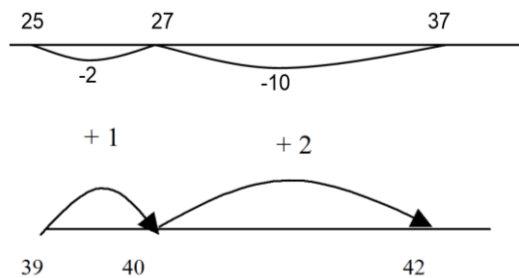
Use concrete objects and pictorial representations

Children understand subtraction as take away and as counting on



Written methods

Use number lines to represent taking away and counting on



Year 3/4

Mental methods

Make choices about whether to count on or count back, depending on numbers involved
Use number line mentally

Written methods

Expanded column subtraction, modelled with Dienes and then with place value counters.
Initially without decomposition

Tens	Ones

$$\begin{array}{r} 70 \ 5 \\ - 40 \ 2 \\ \hline 30 \ 3 \end{array}$$

Then introduce exchanging

$$\begin{array}{r} 200 \ 30 \ 2 \\ - 100 \ 10 \ 4 \\ \hline 100 \ 10 \ 8 \end{array}$$

Children can then move on to compact subtraction for calculations up to 4 digits

$$\begin{array}{r} 232 \\ - 114 \\ \hline 118 \end{array}$$

Year 5/6

Mental methods

Build on methods from Y3/4 extending to larger numbers and decimals

Written methods

Children subtract large numbers and decimals using the compact written method, including different numbers of decimals

Multiplication

EYFS

Mental methods

Use concrete objects and pictorial representations to show and count in groups

Count in twos, fives, tens chanting, and with objects

Double simple numbers

Read number sentences aloud in different ways “five lots of two makes ten”, “ten is equal to five multiplied by two”

Written methods

Children record in pictures, words or symbols

Year 1/2

Mental methods

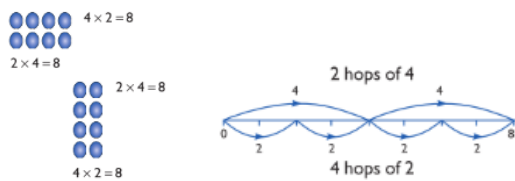
Double numbers up to 20

Use known doubles to work out others e.g. double 15 = double 10 + double 5

Children represent problems with concrete objects, cuisinaire and arrays

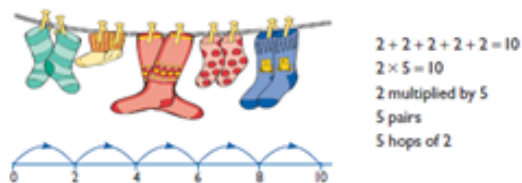
Represent problems as repeated addition and as arrays.

They understand that multiplication can be done in any order (commutative)

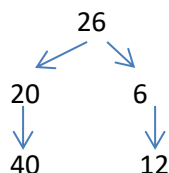


Written methods

Record multiplication on a number line



Double two digit numbers by partitioning

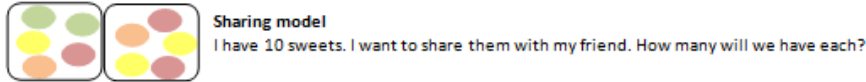
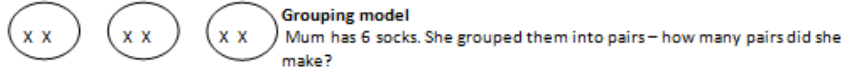


Division

EYFS

Mental methods

Use concrete objects and pictorial representations to show sharing and grouping



Read number sentences aloud in different ways “ten shared between five friends is two”, “six makes three groups of two”.

Children begin to halve even numbers.

Written methods

Children record in pictures, words or symbols

Year 1/2

Mental methods

Children share and group using concrete objects.

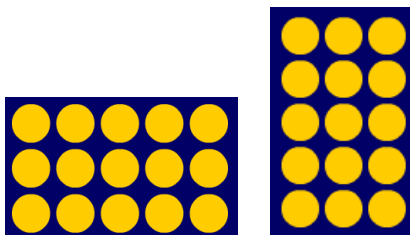
They count in different groups.



Arrays are used as a pictorial representation for division.

$15 \div 3 = 5$ There are 5 groups of 3.

$15 \div 5 = 3$ There are 3 groups of 5

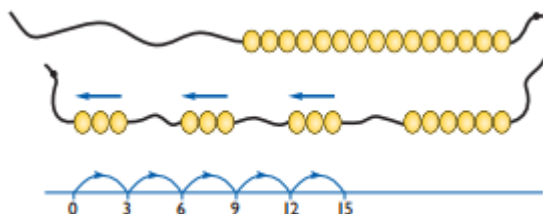


Children should be able to find $\frac{1}{2}$ and $\frac{1}{4}$ and simple fractions of objects, numbers and quantities.

They understand division as the inverse of multiplication

Written methods

Use bead strings and numberlines to jump in repeated groups



Year 3/4

Mental methods

Recall tables up to 12×12

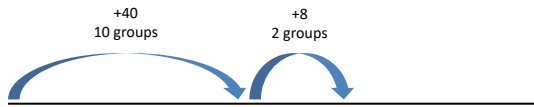
Children half numbers, including odd numbers

Written methods

Numberline

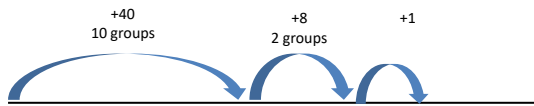
Children become more efficient at jumping on the numberline in groups

$$48 \div 4 = 12$$



They solve sums with remainders

$$49 \div 4 = 12 \text{ r}1$$



Chunking

Children set their work out vertically, without the use of a numberline

$$496 \div 4$$

$$\begin{array}{r} 496 \\ - 400 \text{ (100 lots of 4)} \\ \hline 96 \\ - 80 \text{ (20 lots of 4)} \\ \hline 16 \\ - 16 \text{ (4 lots of 4)} \\ \hline 0 \end{array}$$

$$496 \div 4 = 124$$

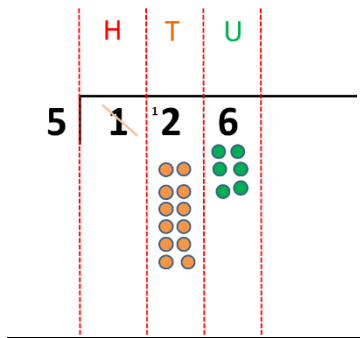
Year 5/6

Mental methods

Children are able to halve 3 digit numbers mentally by partitioning
Children using chunking method mentally, or use jottings on the numberline to help them.
Remainders are interpreted in different ways dependent on context

Written methods

Children are introduced to short division method using place value counters initially.



Leading on to the written method

Handwritten short division showing 6 dividing 1435. The quotient is 239 with a remainder of 1. The work is as follows:

$$\begin{array}{r} 239 \text{ r}1 \\ 6 \overline{) 1435} \\ \underline{12} \\ 23 \\ \underline{18} \\ 55 \\ \underline{54} \\ 1 \end{array}$$

And to long division

Handwritten long division showing 15 dividing 2364. The quotient is 157.6. The work is as follows:

$$\begin{array}{r} 157.6 \\ 15 \overline{) 2364.0} \\ \underline{15} \\ 86 \\ \underline{75} \\ 114 \\ \underline{105} \\ 90 \\ \underline{90} \\ 0 \end{array}$$