

Calculations Evening
Year 3 and 4

Welcome!

Addition

Mental Calculations

Partitioning

$$36 + 24$$

$$30 + 20 + 6 + 4$$

Number bond to 10



Near doubles

$$30 + 31$$

$$7 + 6$$

$$12 + 11$$

Bridging through
10 or 100

$$9 + 4 = 13$$

1 and 3 more

$$85 + 20$$

15 and 5 more

Adding near
multiples of 10
and **adjusting**

$$60 + 51$$

$$60 + 50 + 1$$

$$30 + 29 + 19$$

$$30 + 30 + 20 - 2$$

Using known
number facts

I know that $4 + 3 = 7$.

So how can I solve $40 + 30$?

I know that $60 + 30 = 90$.

So how can I solve $600 + 300$?

Practising
mental methods
with increasingly
large numbers.

$$\begin{aligned}55 + 37 &= 55 + 30 + 7 \\ &= 85 + 7 \\ &= 92\end{aligned}$$

$63 + 29$ is the same as...
 $63 + 30 - 1$

Addition

Written Calculations

Expanded method

$$30 + 4$$

$$\underline{20 + 5}$$

$$50 + 9$$

$$200 + 30 + 4$$

$$\underline{500 + 20 + 7}$$

$$700 + 60 + 1$$

10



Column method

$$34$$

$$+ \underline{25}$$

$$59$$

$$234$$

$$+ \underline{527}$$

$$761$$

1

Column method

Larger numbers up
to 4 digits

$$\begin{array}{r} 789 \\ + \underline{642} \\ \hline 1431 \\ \quad 11 \end{array}$$

Decimal addition for
money

$$\begin{array}{r} \pounds 1.22 \\ + \underline{\pounds 0.15} \\ \hline \pounds 1.37 \end{array}$$

Subtraction

Mental Calculations

Children are taught to...

HTU +/- U

HTU +/- T

HTU +/- H

$$5003 - 4996$$

Find a small difference by counting up.

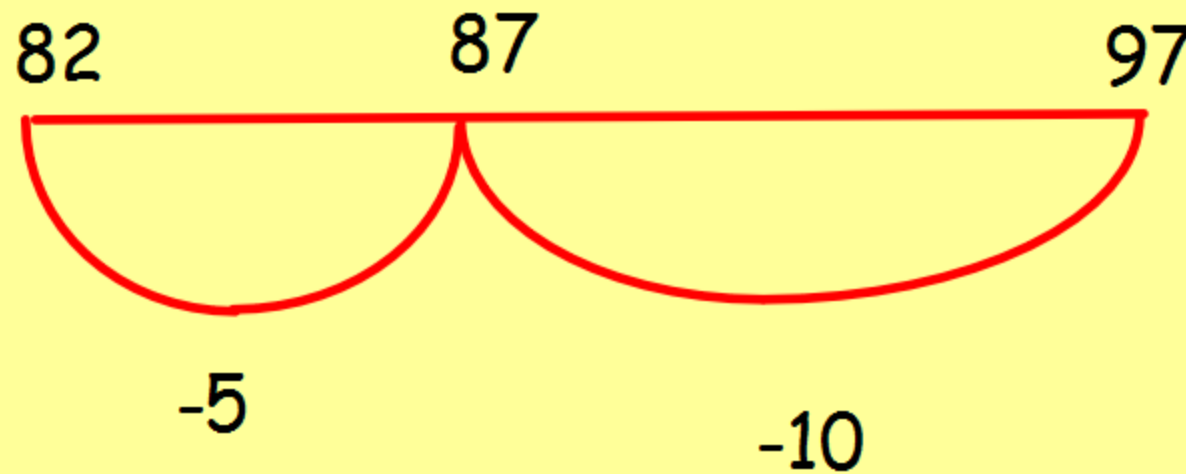
Strategies to support mental calculations



$$97 - 15 =$$

Children are encouraged to visualise a number line mentally.

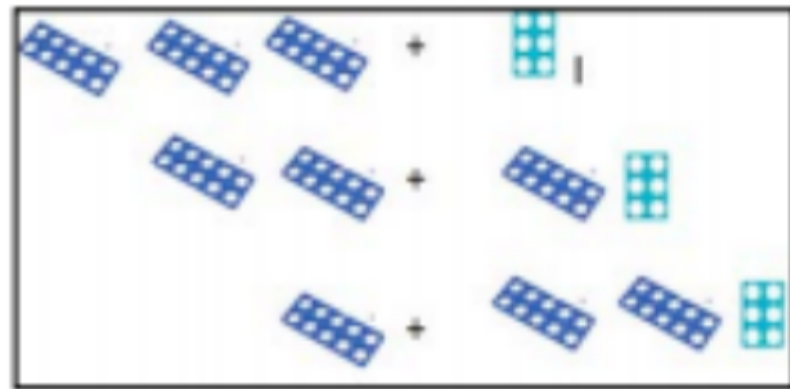
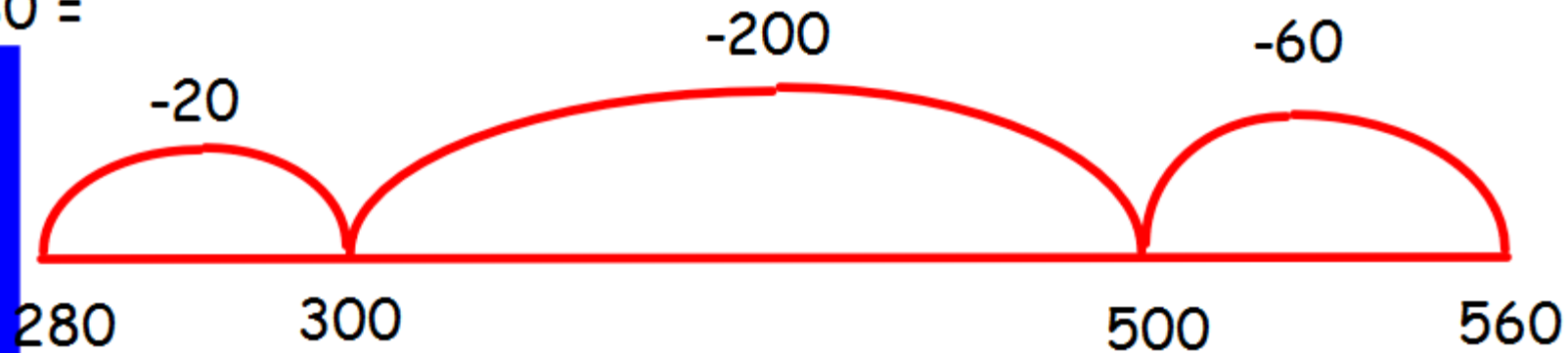
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100



Representations to support mental and written calculations

Partitioning and re-partitioning support the understanding of place value

$$560 - 280 =$$



$$\begin{array}{l} 30 + 6 \\ 20 + 16 \\ 10 + 26 \end{array} \begin{array}{l} \rightarrow \\ \rightarrow \\ \rightarrow \end{array} = 36$$

Written Calculations

Extended column - no exchange

$$87 - 53 =$$

$$\begin{array}{r} - 80 \text{ and } 7 \\ 50 \text{ and } 3 \\ \hline 30 \text{ and } 4 = 34 \end{array}$$

Extended column - with exchange

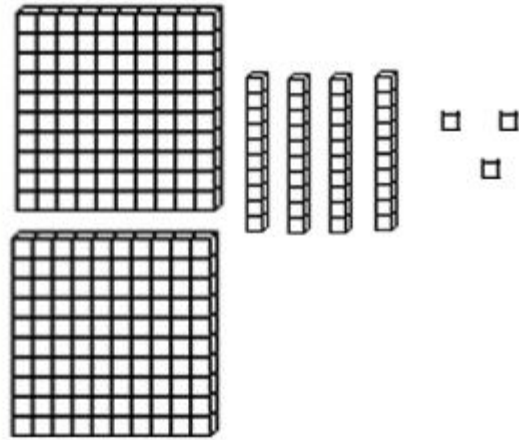
$$87 - 58$$

$$\begin{array}{r} - 70 + 17 \\ 50 + 8 \\ \hline 20 + 9 \end{array}$$

$$\begin{array}{r} 70 \\ 87 \\ - 58 \\ \hline 29 \end{array}$$

Formal column method

Dienes



200 40 3

Place Value Counters



200 40 3

These link well
with money and
the concept of
coins.

Multiplication

Mental Calculations - Y3

As well as
2x, 5x and
10x from
year 2...

3 TIMES TABLE

$3 \times 0 = 0$

$3 \times 1 = 3$

$3 \times 2 = 6$

$3 \times 3 = 9$

$3 \times 4 = 12$

$3 \times 5 = 15$

$3 \times 6 = 18$

$3 \times 7 = 21$

$3 \times 8 = 24$

$3 \times 9 = 27$

$3 \times 10 = 30$

4 TIMES TABLE

$4 \times 0 = 0$

$4 \times 1 = 4$

$4 \times 2 = 8$

$4 \times 3 = 12$

$4 \times 4 = 16$

$4 \times 5 = 20$

$4 \times 6 = 24$

$4 \times 7 = 28$

$4 \times 8 = 32$

$4 \times 9 = 36$

$4 \times 10 = 40$

8 TIMES TABLE

$8 \times 0 = 0$

$8 \times 1 = 8$

$8 \times 2 = 16$

$8 \times 3 = 24$

$8 \times 4 = 32$

$8 \times 5 = 40$

$8 \times 6 = 48$

$8 \times 7 = 56$

$8 \times 8 = 64$

$8 \times 9 = 72$

$8 \times 10 = 80$

Use doubling to link the 2,4 and 8 times tables

$$6 \times 2 = 12 \longrightarrow 6 \times 4 = 24 \longrightarrow 6 \times 8 = 48$$

Partitioning the tens and units

$$57 \times 6 = (50 \times 6) + (7 \times 6) = 300 + 42 = 342$$

Mental Calculations - Y4

Times
tables 1-12
by the end
of Y4

x	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144

Recognise and use factor pairs mentally

$$2 \times 3 = 6$$



$$200 \times 300 = 60,000$$

$$7 \times 8 = 56$$



$$70 \times 80 = 5600$$

Written Calculations

Grid Method

x	20	4
6	120	24

Expanded column method

$$\begin{array}{r} 24 \\ x 6 \\ \hline 120 \\ 24 \\ \hline 144 \end{array}$$

Formal column method

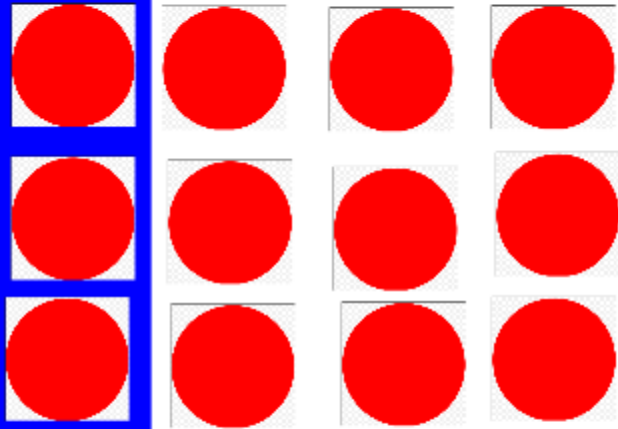
$$\begin{array}{r} 24 \\ 6 \\ \hline 144 \\ 2 \\ \hline \end{array}$$

Representations to support mental and written calculations

x

4

3

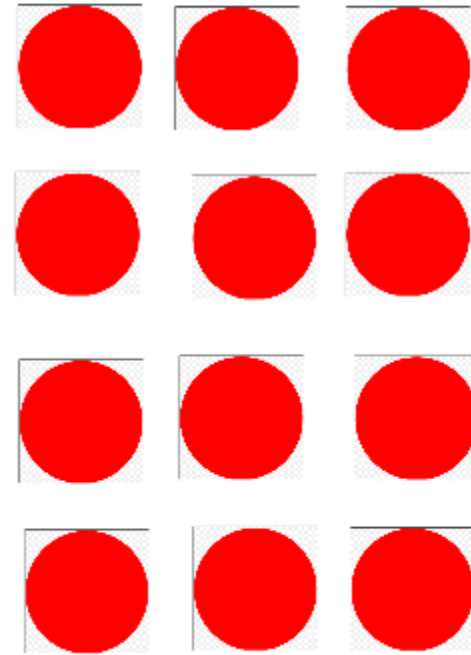


Arrays

x

3

4



"3 groups of 4"

"4 groups of 3"

x	3
4	12

Moving Digits

Multiplying and dividing confidently by 10, 100 and 1000.



$\times 10 =$



Division

Mental Methods

Year 3

Multiplication and division facts for the 3, 4 and 8 x tables.

Year 4

Multiplication and division facts for tables up to 12 x 12.

Understanding commutativity

$$\underline{4 \times 8} = \underline{8 \times 4}$$

$$\underline{4 \times 10 \times 5} = \underline{4 \times 5 \times 10}$$

Inverse

$$4 \times 3 = 12 \text{ so } 12 \div 3 = 4$$

Vital for missing number problems:
 $5 \times \underline{\quad} = 15$

Partitioning

$$36 \div 3 = 12$$

$$30 \div 3 = 10$$

$$6 \div 3 = 2$$

$$10 + 2 = 12$$

Using known facts

I know $6 \div 3 = 2$ so
 $600 \div 3 = 200$

Division

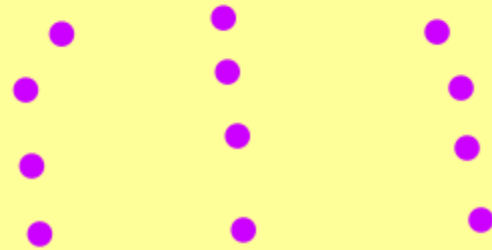
Written calculations

Grouping

$$120 \div 3 =$$



$$12 \div 3 =$$

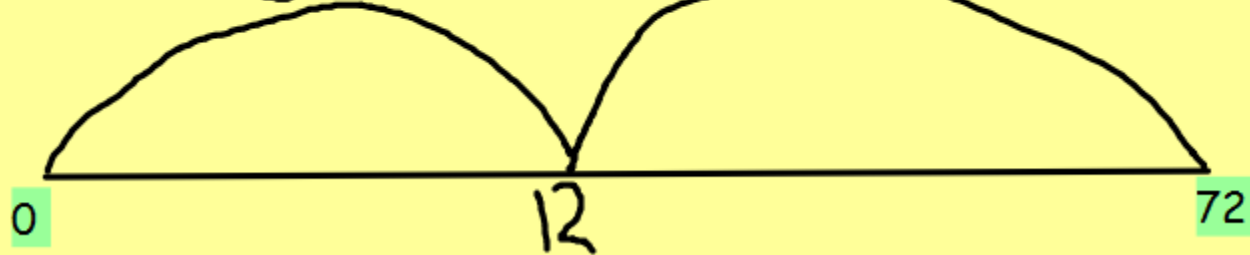


Chunking

$$72 \div 6 =$$

$$2 \times 6$$

$$10 \times 6 = 60$$



Arrays

Image to support division

$$56 \div 7 =$$

