

The ability to calculate in your head is an important part of mathematics. It is also an essential part of coping with managing everyday activities. This document has been developed to support all staff with the teaching of mental strategies. The aim of the document is to build efficient mental strategies of all pupils in order to apply these skills in a range of scenarios.

In our Mental Calculation Policy, there are twelve strategies.

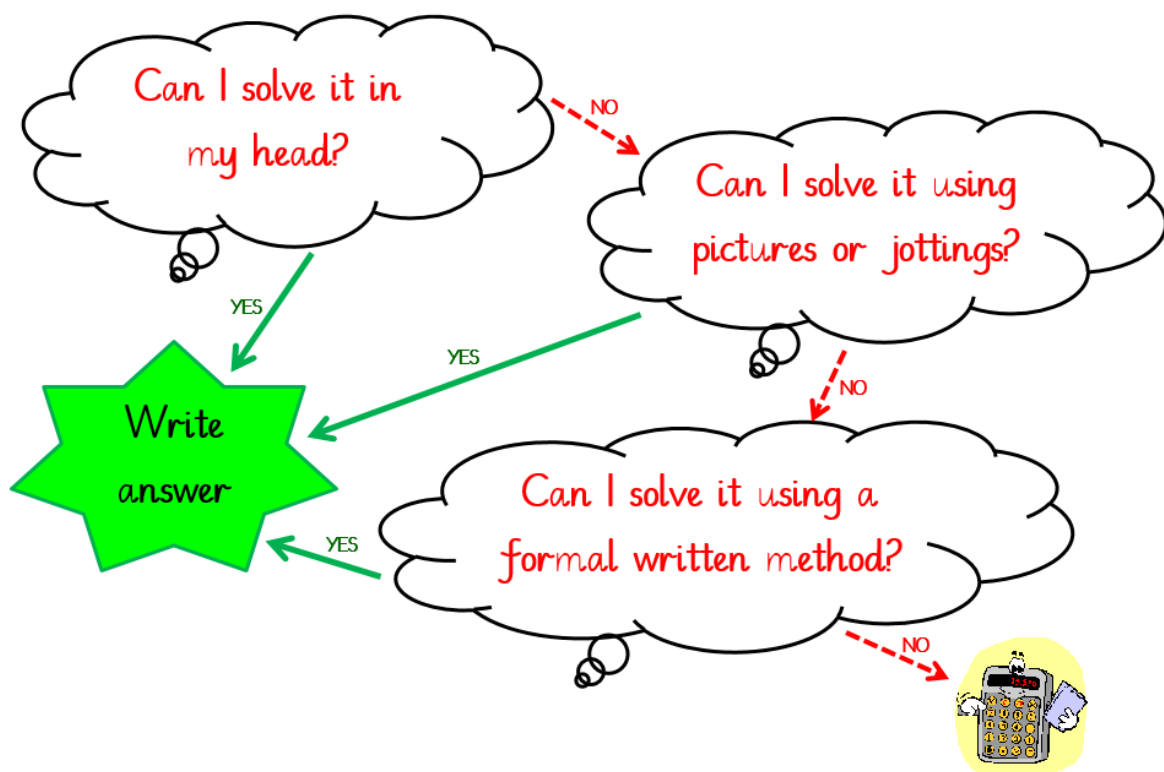
1	Number bonds
2	Near doubles
3	Counting up and small differences
4	Using known facts
5	Partitioning and recombining
6	Partitioning
7	Rounding / adjusting
8	Rearranging
9	Place value
10	Using x10
11	Factorising
12	Extending doubling and halving



Our Mental Calculation strategies

Our Trust Mantra

- Head it!
- Jot it!
- Write it!



Our Mental Calculation strategies



Number Bonds

1-6

Addition

$$37 + 8$$

$$(37 + 3) + 5$$

Subtraction

$$32 - 8$$

$$(32 - 2) - 6$$

Our Mental Calculation strategies



Near Doubles

1-6

Addition

$$7 + 6$$

$$(6 + 6) + 1$$

or

$$(6 \times 2) + 1$$

Our Mental Calculation strategies

Counting up and small differences

2-6

Subtraction

$$65 - 48$$

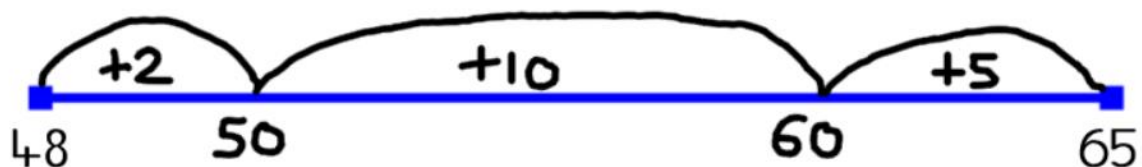
$$48 + 2 = 50$$

$$50 + 10 = 60$$

$$60 + 5 = 65$$

$$\left. \begin{array}{l} 50 + 10 = 60 \\ 60 + 5 = 65 \end{array} \right\} \text{ or } 50 + 15 = 65$$

$$10 + 5 + 2 = \underline{17}$$



Our Mental Calculation strategies

Using known facts

2-6

Multiplication

$$7 \times 3 = 21$$

$$70 \times 30 \rightarrow 21 \times 100$$

$$0.7 \times 0.3 \rightarrow 21 \div 100$$

Division

$$14 \div 7 = 2$$

$$1400 \div 70 \rightarrow 21 \times 100$$

$$1.4 \div 7 \rightarrow 2 \div 10$$

$$\cancel{900} \div \cancel{300}$$

Remove same amount of
place holders from both sides



Basket size

÷



Egg size

=



Amount of eggs

Bigger basket/smaller egg = more eggs will fit in

Smaller basket/bigger egg = less eggs will fit in

Our Mental Calculation strategies

Partitioning and recombining

2-6

Addition

$$26 + 37$$

largest number first $\rightarrow 37 + 26$

$$(30 + 20) + (7 + 6)$$

or

$$(37 + 20) + 6$$

Subtraction

$$38 - 15$$

$$(30 - 10) + (8 - 5)$$

or

$$(38 - 10) - 5$$

$$32 - 15$$

$$(32 - 10) - 5$$

Multiplication

$$36 \times 5$$

$$(30 \times 5) + (6 \times 5)$$

Doubling

Double 17

$$(10 + 7)$$

$$\begin{array}{r} \times 2 / \quad \backslash \times 2 \\ 20 \quad + \quad 14 \end{array}$$

$$= \underline{34}$$

Halving

Halve 34

$$(30 + 4)$$

$$\begin{array}{r} \div 2 / \quad \backslash \div 2 \\ 15 \quad + \quad 2 \end{array}$$

$$= \underline{17}$$

Our Mental Calculation strategies



Partitioning

2-6

Addition

$$1,876 + 452$$

$$1,876 + 400 + 50 + 2$$

$$1,876 + 400 = 2,276$$

$$1,876 + 50 = 2,326$$

$$1,876 + 2 = 2,328$$

Subtraction

$$1,234 - 567$$

$$1,234 - 500 - 60 - 7$$

$$1,234 - 500 = 734$$

$$1,876 - 60 = 674$$

$$1,876 - 7 = 667$$

Our Mental Calculation strategies



Rounding and adjusting

1-6

Addition

$$47 + 28$$

$$(47 + 30) - 2$$

Subtraction

$$52 - 27$$

$$(52 - 30) + 3$$

Our Mental Calculation strategies

Rearranging

2-6

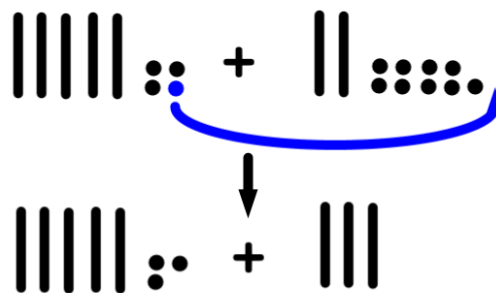
Addition

$$54 + 29$$

*Add to one number and
subtract same amount
from the other*

$$\begin{array}{r} -1 \\ (53 + 30) \end{array}$$

*Make one number
a multiple of 10*



Subtraction

$$52 - 29$$

*Add/subtract same
amount to both numbers*

$$\begin{array}{r} +1 \\ (53 - 30) \end{array}$$

*Make second number
a multiple of 10*

$$91 - 62$$

$$\begin{array}{r} -2 \\ (89 - 60) \end{array}$$



Our Mental Calculation strategies



Place Value

4-6

Multiplication

$$1.8 \times 200$$

$$(1.8 \times 2) \times 100$$
$$3.6 \times 100 = 360$$

or

$$(1.8 \times 100) \times 2$$
$$180 \times 2 = 360$$

Division

$$52 \div 20$$

$$(52 \div 2) \div 10$$
$$26 \div 10 = 2.6$$

or

$$(52 \div 10) \div 2$$
$$5.2 \div 2 = 2.6$$

Our Mental Calculation strategies



Using x 10

Doubling

$$260 \div 5$$

$$(260 \div 10) \times 2$$

Halving

$$24 \times 5$$

$$\begin{array}{r} 24 \times 10 \\ \hline 2 \end{array}$$

Our Mental Calculation strategies



Factorising

4-6

$$35 \times 6$$

Diagram showing 35 being factored into 5 and 7:

$$(5 \times 7) \times 6$$

↓ Re-order

$$7 \times (6 \times 5)$$
$$7 \times 30$$

What could we use
to help us here?

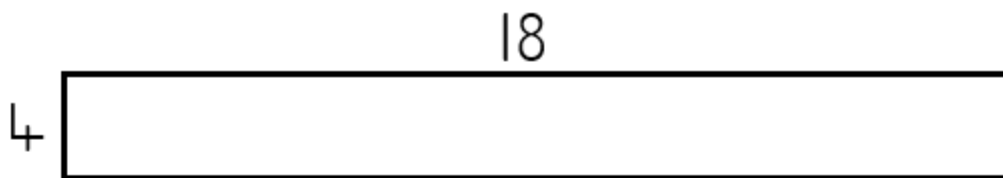
7 x 3 then x 10

Our Mental Calculation strategies



Extending doubling and halving

5-6



$$\div 2 \left(\begin{array}{c} 18 \times 4 \\ 9 \times 8 \end{array} \right) \times 2$$

