

The methods included in this booklet are taken from Moorgate Calculation Procedure.

Staff use these as guidance, so you will be supporting your child in the same ways.

All children learn at different paces. Some will be using strategies from lower in school, and others will progress to the next ones. This booklet is provided as a guide only, but if you would like a copy of the years below/ above your child's school year, please come and see your class teacher. They will be happy to discuss this with you.



Moorgate Calculation

Year 3

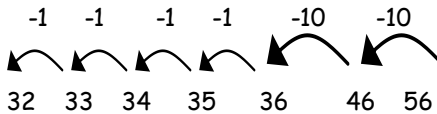
Help at Home

SUBTRACTION

Subtraction by counting back (or taking away)

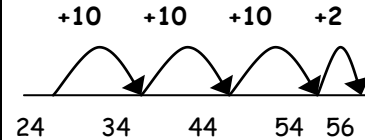
For 2 digit numbers, you can count back in 10s and 1s

$$56 - 24 = 32$$



Subtraction by counting up

Alternatively, differences can be found by counting up:



This is then written as:

$$10 + 10 + 10 + 2 = 32$$

Expanded method

Your child will be introduced to this method, but will need to split/partition numbers into tens and units, and **exchange** tens for ones

80	3	70	13	70	1
- 30	8	30	8	- 30	8
40	5			40	5

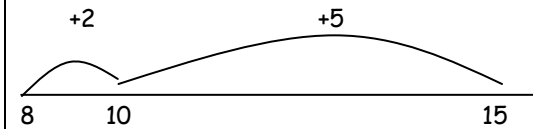
ADDITION

In Years 2 and 3, children use two main methods of adding - the number line and partitioning

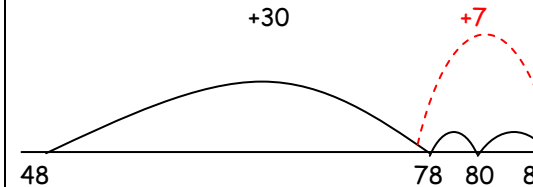
The number line

Steps in addition can be recorded on a number line. The steps often bridge through a multiple of ten

$$8 + 7 = 15$$



$$48 + 37 =$$



As a jotting, it might look like this:

$$48 + 37$$

$$48 + 30 = 78$$

$$78 + 7 = 85$$

OR

$$48 + 30 + 7 = 85$$

ADDITION continued...

In Years 2 and 3, children use two main methods of adding - the number line and partitioning

Column addition

Steps are then written as jottings, as the first step to column addition

HTU	TU	HTU
8	+	7
= 15		
50	+	80
= 130		
130	+	15
= 145		

Partitioned numbers are then written under one another: -

$$\begin{array}{r} 50 \quad 8 \\ 80 \quad 7 \\ \hline 130 \quad 15 \end{array} = 145$$

A. Single 'carry' in units

Adding the ones first

$$\begin{array}{r} \text{TU} \\ 67 \\ + 24 \\ \hline 11 \\ \hline 80 \\ \hline 91 \end{array}$$

B. 'Carry' in units and tens

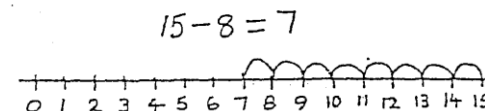
$$\begin{array}{r} \text{TU} \\ 58 \\ + 87 \\ \hline 15 \\ \hline 130 \\ \hline 145 \end{array}$$

SUBTRACTION

Number line and practical methods

During Year 1, your child was encouraged to use a number line to support calculations - by counting back in ones:

I hopped back 8 times and landed on 7, so the answer is 7.

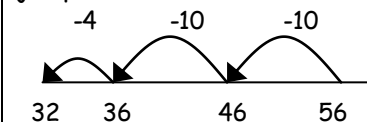


The empty number line helps to record or explain the steps in mental subtraction. It is an ideal model for counting back and bridging (going over) ten, as the steps can be shown clearly. It can also show counting up from the smaller to the larger number to find the difference

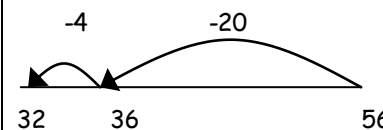
Subtraction by counting back (or taking away)

$$56 - 24 = 32$$

Subtract the units in a single jump



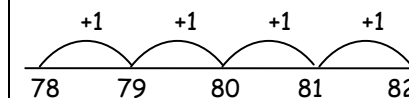
Then subtract tens and units in single jumps



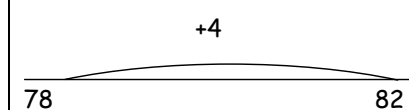
Subtraction by counting up

$$82 - 78 = 4$$

First, count in ones



Then, use number facts to count in a single jump

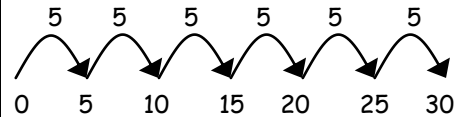


DIVISION

Number line division and mental division

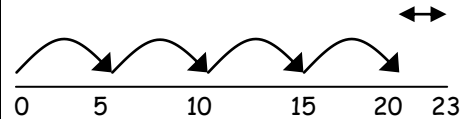
During Year 2, your child was introduced to the number line as a way of linking division to multiplication. It can show division both as repeated subtraction, and as counting forward to find how many times one number 'goes into' another.

$30 \div 5$

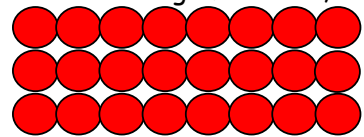


It also helps the children deal with remainders:

$25 \div 5 = 4 \text{ r } 3$



Some children will continue to use arrays to develop their understanding of division, and to link to multiplication facts.



This array can show $24 \div 3$ and $24 \div 8$

Children use symbols to stand for unknown numbers:

$\square \div 2 = 4$

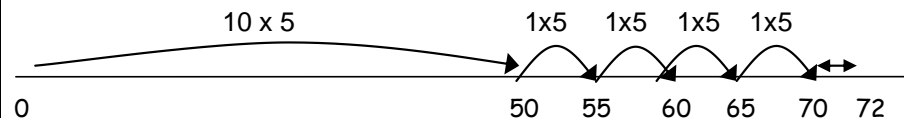
$20 \div \triangle = 4$

$\square \div \triangle = 4$

You can help by practising some of these with your child, and discuss what they have found.

The number line is extended over Years 3 and 4 to larger numbers:

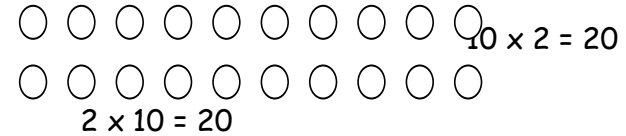
$72 \div 5 = 14 \text{ r } 2$



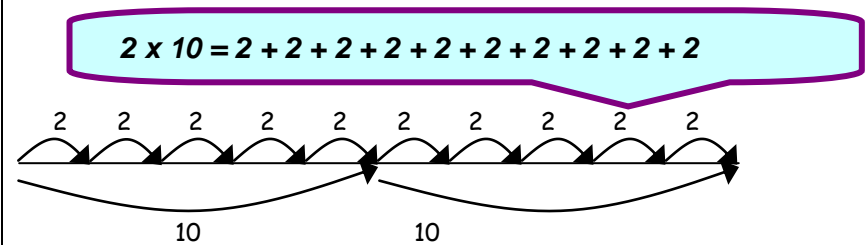
MULTIPLICATION

Arrays

These are introduced in Key Stage 1



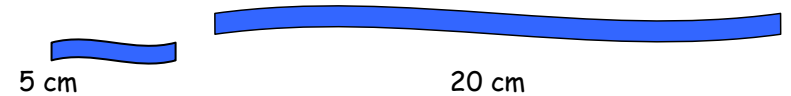
Using a number line



You could use practical objects such as money to help your child

Scaling

e.g. Find a ribbon that is 4 times as long as the blue ribbon



Using symbols to stand for unknown numbers to complete equations using inverse operations

$\square \times 5 = 20$

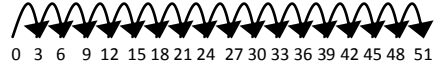
$3 \times \triangle = 18$

$\square \times \circ = 32$

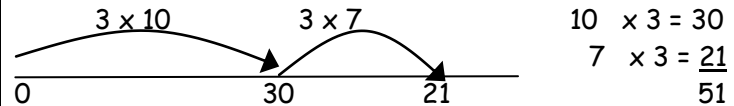
MULTIPLICATION cont...

Later, this changes to jottings:

$$3 \times 17$$



Becomes



For some children, this then leads to the Grid Method

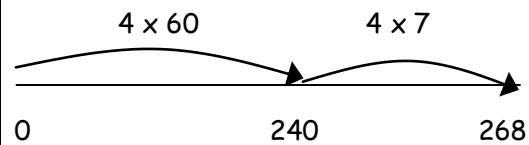
$$\begin{array}{r} \times \quad 10 \quad 7 \\ \hline 30 \quad 21 \\ \hline \end{array} = 51$$

These jottings can be extended to numbers over 100

Eg. $4 \times 67 =$

$$\begin{array}{r} 60 \quad + \quad 7 \\ \downarrow \quad \quad \downarrow \\ \times 4 \quad 240 \quad \quad 28 \quad \times 4 \quad = 268 \end{array}$$

OR on a number line:



OR written out:

$$\begin{array}{r} 60 \times 4 = 240 \\ 7 \times 4 = \underline{28} \\ 268 \end{array}$$