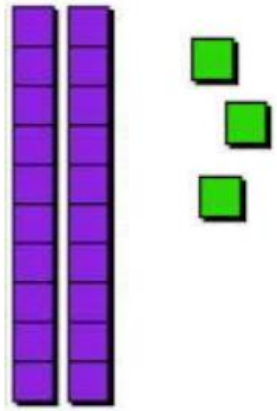
Maths at St Katharine's School

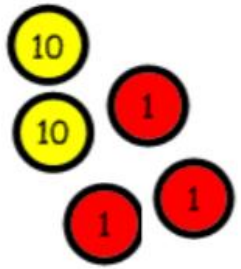
Key Stage 2

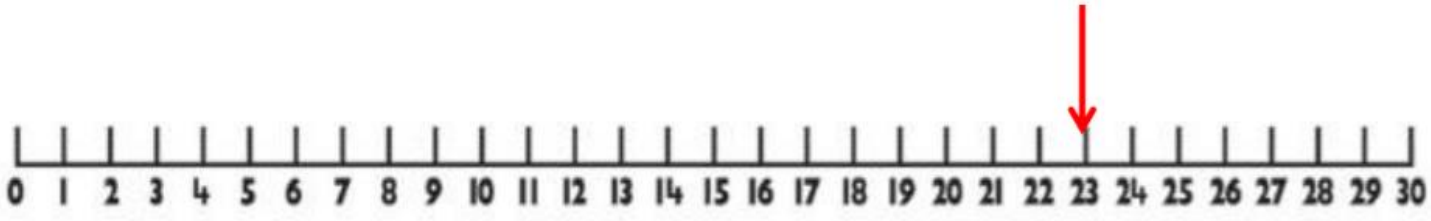
Teaching for mastery to develop fluency alongside conceptual understanding

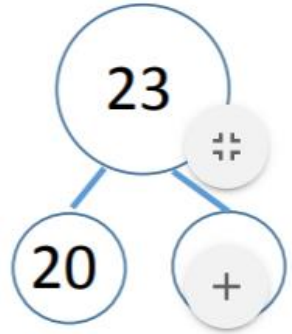
Concrete then pictorial then abstract

Representations of numbers









23 = 20 + 3

Place Value

M	HTH	TTH	Th	H	T	O •	1/10	1/100

Addition and Subtraction

- Choose your method for accuracy and efficiency

Which method would you choose?

a) 456 + 9 =

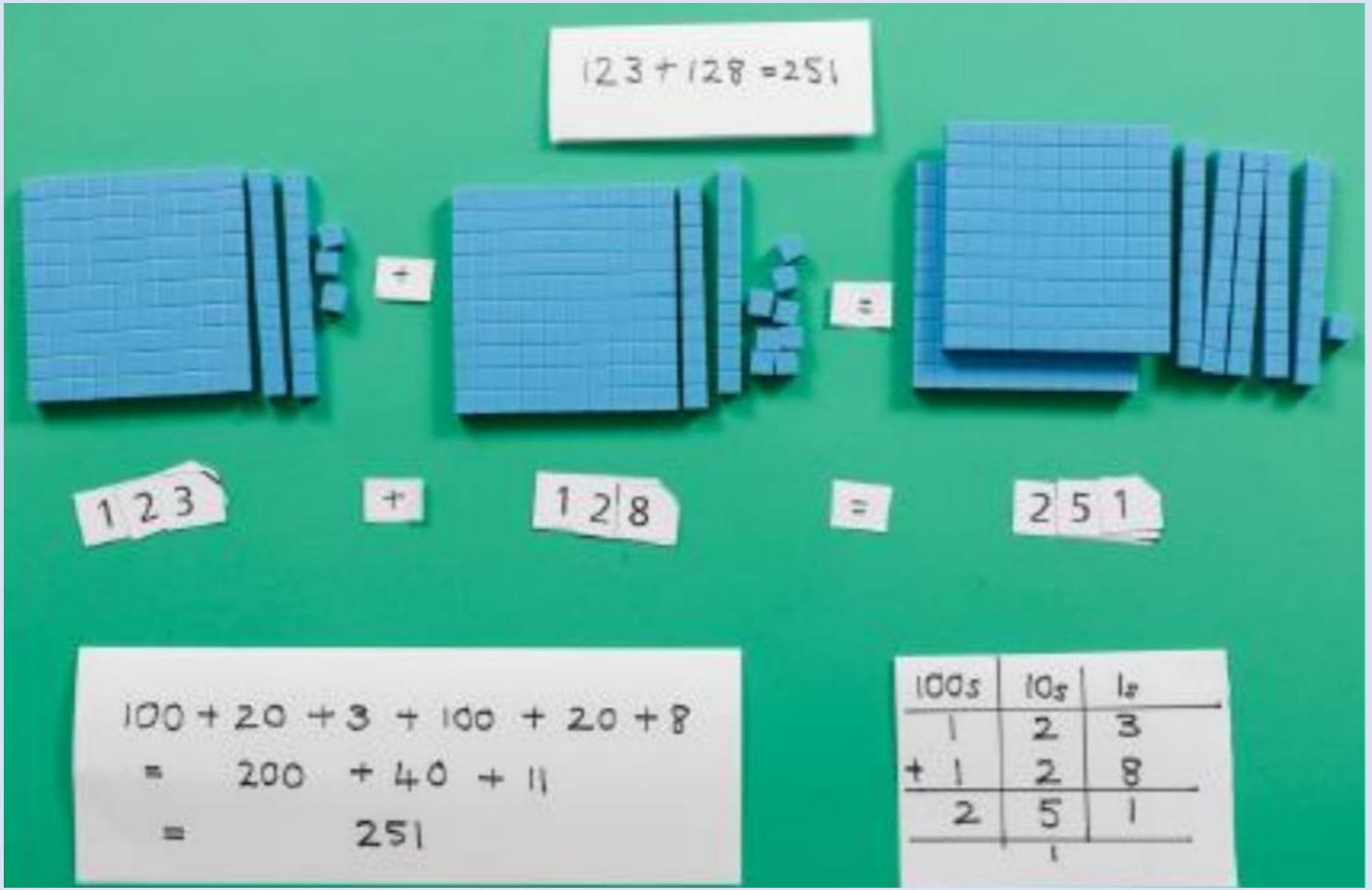
b) 245 – 19 =

c) 23.4 + 9.63 =

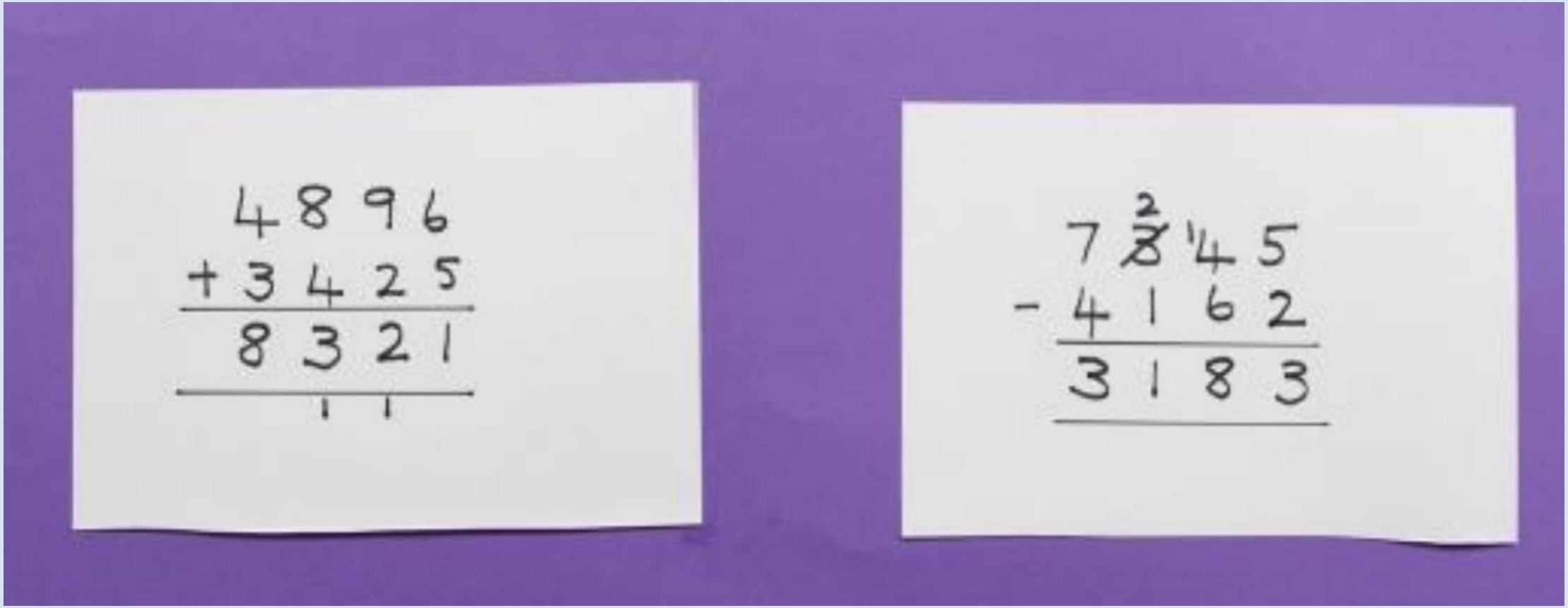
d) 15 + 16 =

e) 77 + 5 =

f) 2001 – 1998 =

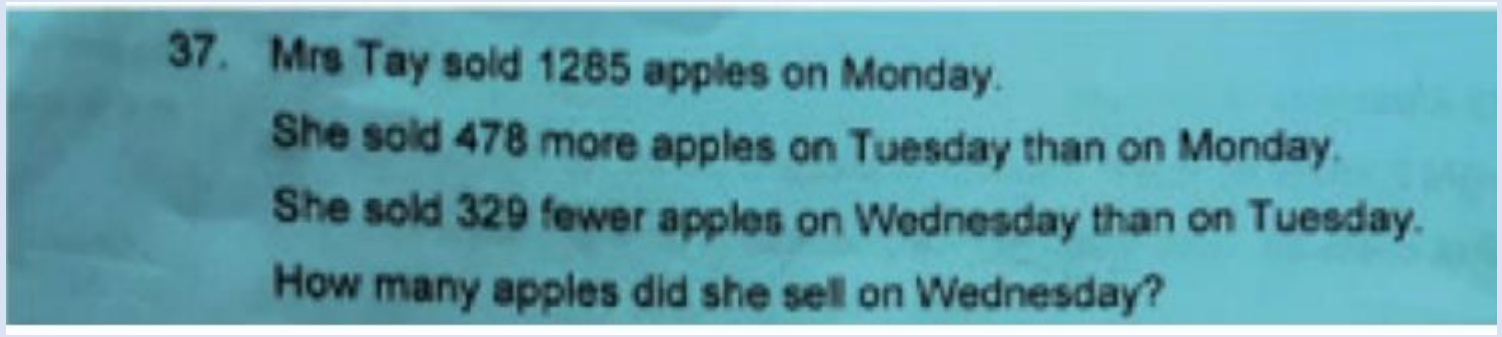

123 + 128 = 251
123
+
128
=
251
100 + 20 + 3 + 100 + 20 + 8
= 200 + 40 + 11
= 251
100s | 10s | 1s
1 | 2 | 3
+ 1 | 2 | 8
2 | 5 | 1
1

Formal written methods addition and subtraction showing ‘regrouping’ and ‘exchanging’



What is the bar model?

- Helps visualise the problem
- Has conceptual underpinning that we have to understand
- Is a way to communicate what the child has understood

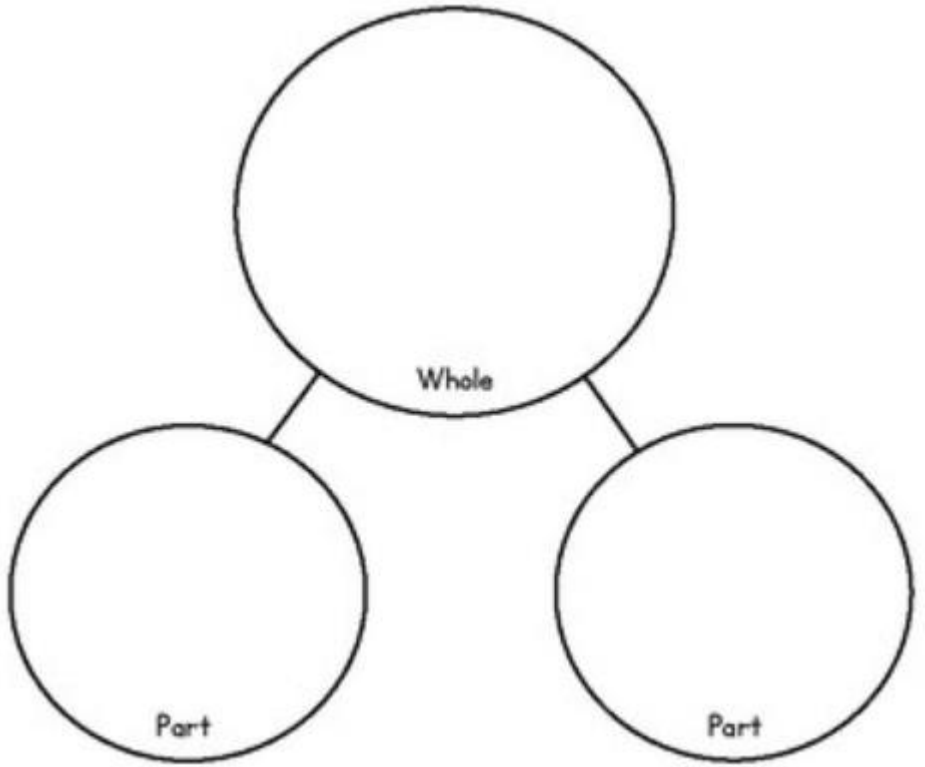


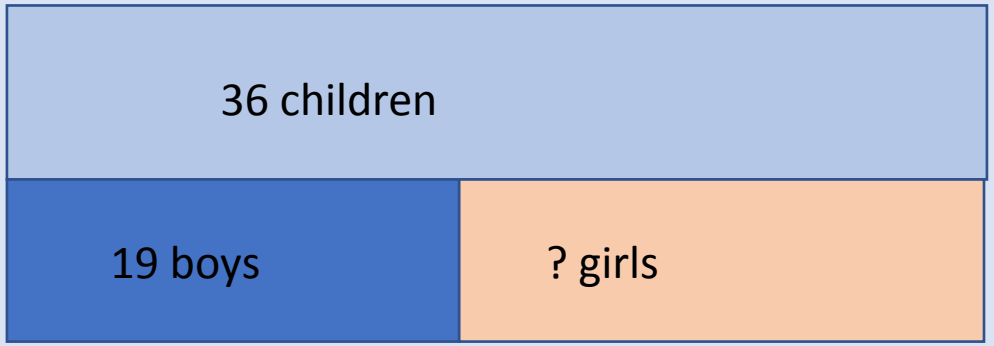
PART-WHOLE MODEL

There are 36 children in the school band.

19 of them are boys.

How many girls are there?





Times Tables

Times tables your child is expected to learn

- Year 2 2x, 5x, 10x
- Year 3 3x, 4x, 8x
- Year 4 6x, 7x, 9x, 11x, 12x Compulsory Test Summer Term
- Year 5 revision of all the times tables
- Year 6 revision of all the times tables

Times Tables

Why learn your times tables?

Really establish the patterns with the 2 x table before learning it by rote and before trying to learn all the others

Say the multiplication fact, not the multiple

Go slowly just up to 5 x 2 to start with

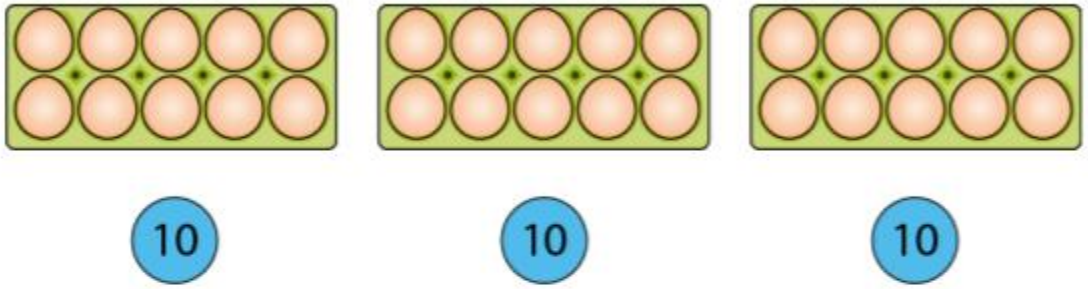
Have your child write it out and look at the products – point out the pattern – all even

Use concrete apparatus like 2p coins to represent the fact

Call out individual facts eg 7 x 2 = practise, practise, practise

Times tables

'How many eggs are there? Count in groups of ten.'



- *'Ten, twenty, thirty. There are thirty eggs.'*
- *'There are three groups of ten; there are thirty altogether.'*

$3 \times 10 = 30$

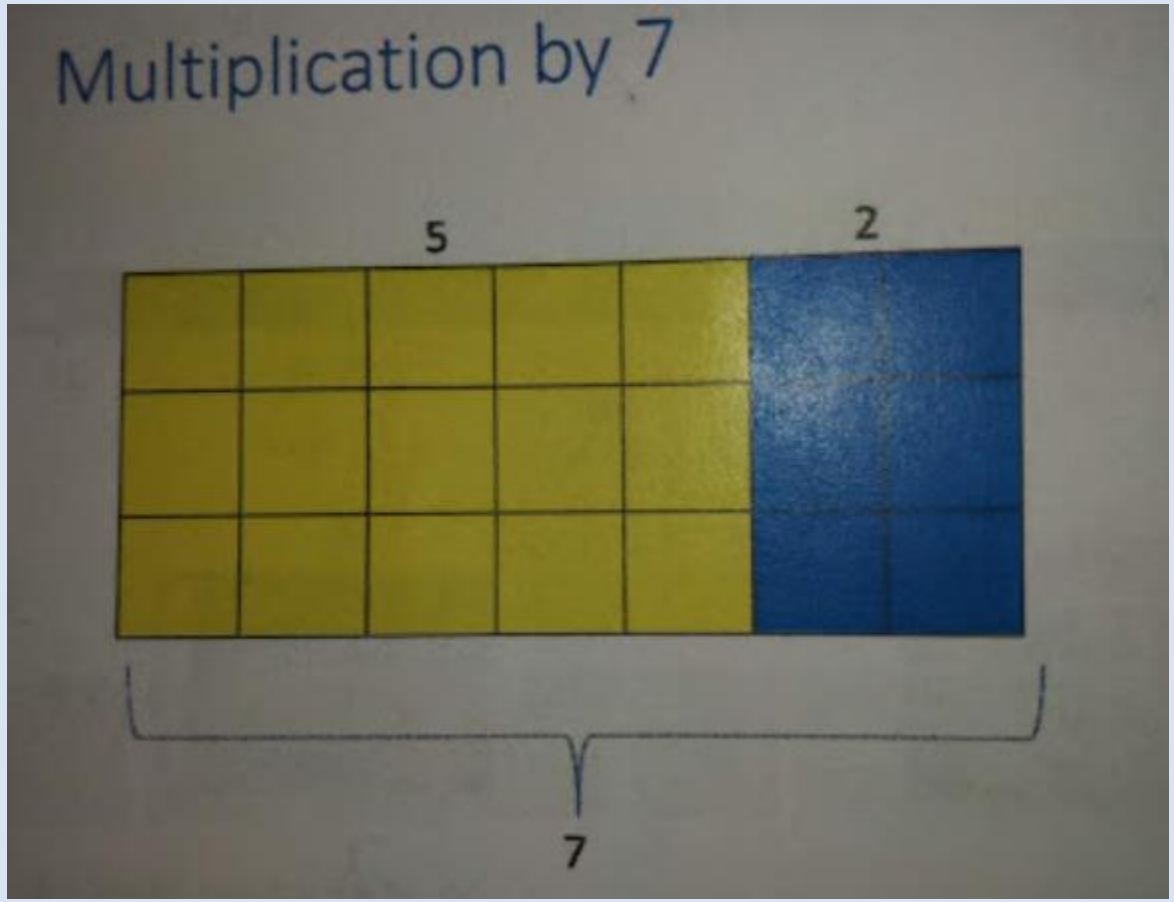
- *'Three is a factor.'*
- *'Ten is a factor.'*
- *'The product of three and ten is thirty.'*
- *'Thirty is the product of three and ten.'*

$1 \times 10 = 10$	$10 \times 1 = 10$
$2 \times 10 = 20$	$10 \times 2 = 20$
$3 \times 10 = 30$	$10 \times 3 = 30$
$4 \times 10 = 40$	$10 \times 4 = 40$
$5 \times 10 = 50$	$10 \times 5 = 50$
$6 \times 10 = 60$	**$10 \times 6 = 60$**

Doubling or Halving

- 2 x leads to 4 x
- 4 x leads to 8 x
- 10 x leads to 5 x

Distributive law



3 x a = (2 x a) + (1 x a)

Example 3 x 6 = 12 + 6 = 18

6 x 6 = (5 x 6) + (1 x 6)

7 x 3 = (5 x 3) + (2 x 3)

9 x table

9 x 9 = *9 less than 90*

9 x 8 = *8 less than 80*

9 x 7 = *7 less than 70*

9 x 6 = *6 less than 60*

Written methods of multiplication

$3 \times 32 = ?$

	10s	1s
	3	2
×		3
		6
	9	0
	9	6

3×2 ones $= 6$ ones

3×3 tens $= 9$ tens

Compact method

$$\begin{array}{r} 18 \\ \times \quad 5 \\ \hline 90 \\ \hline 4 \end{array}$$

Using the correct language

Expanded and compact short multiplication

	1,000s	100s	10s	1s
		3	6	7
×				4
			2	8
		2	4	0
	1	2	0	0
	1	4	6	8

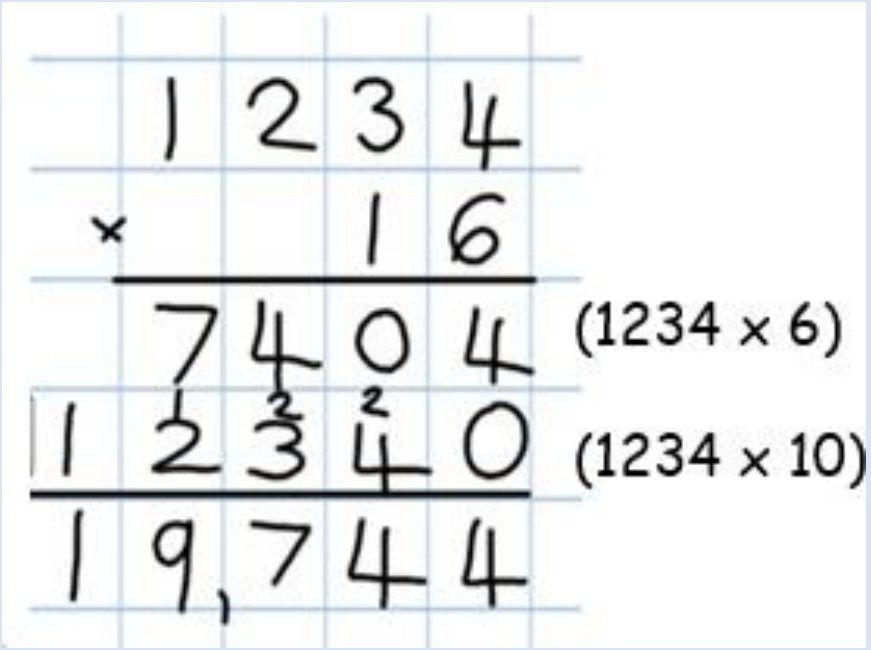
4×7 ones $= 28$ ones
$= 2$ tens $+ 8$ ones

4×6 tens $= 24$ tens
$= 2$ hundreds $+ 4$ tens

4×3 hundreds $= 12$ hundreds
$= 1$ thousand $+ 2$ hundreds

		3	6	7
×				4
	1	4	6	8
		2	2	

Long Multiplication

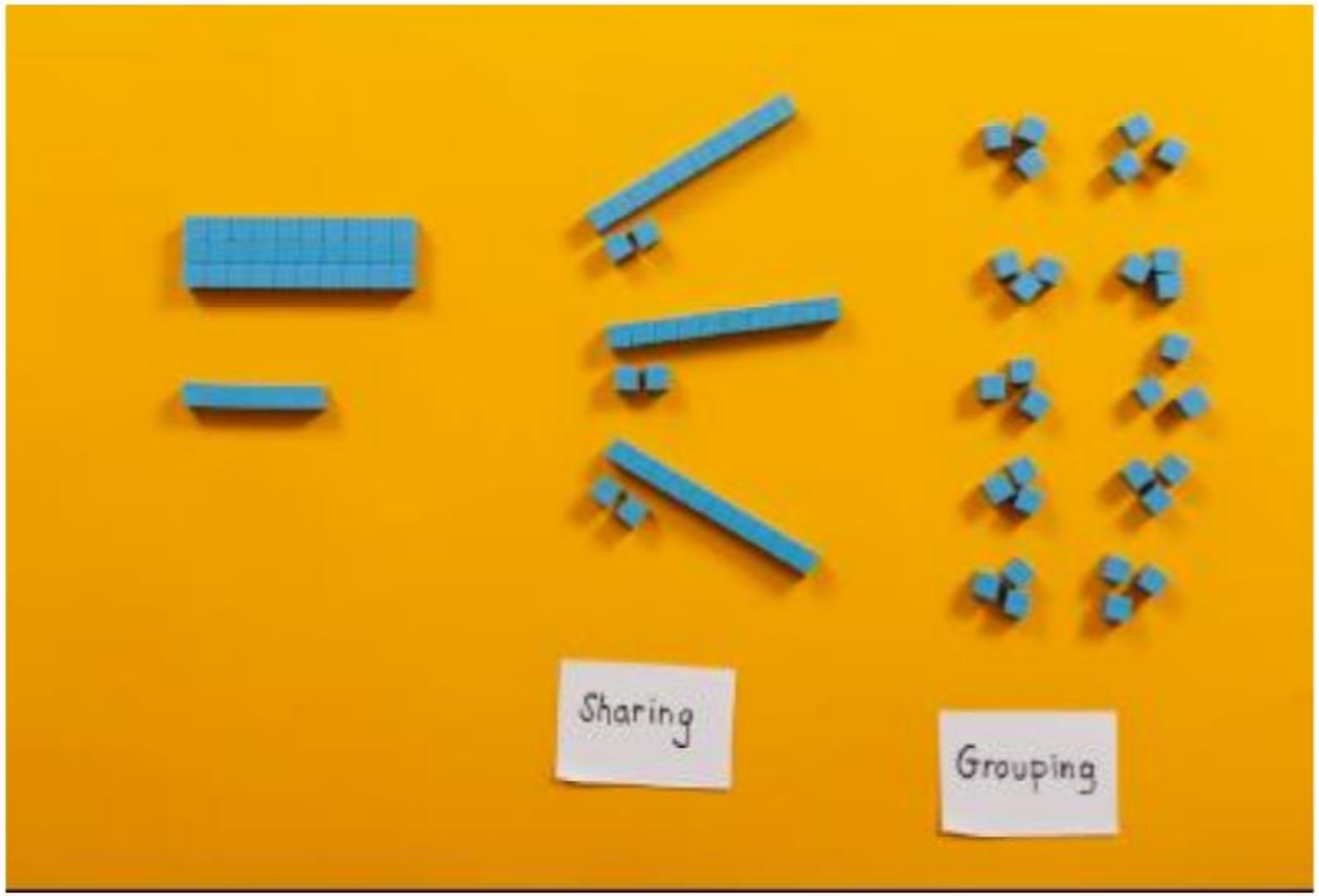


Deep conceptual understanding not procedure alone

'Draw a line to match each multiplication expression with the correct addition expression.'

4×203	$800 + 40 + 12$
3×204	$800 + 12$
4×213	$600 + 30 + 12$
3×214	$600 + 12$

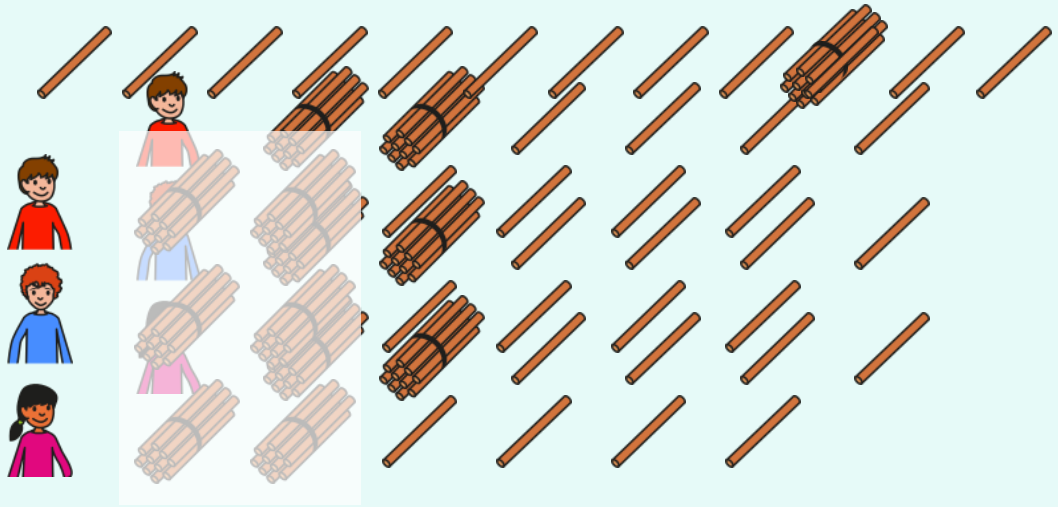
Year 3 & 4 Division - grouping



$36 \div 3 = 12$

72 sticks shared equally between 3 children. How many sticks each?

$$72 \div 3 = \square$$

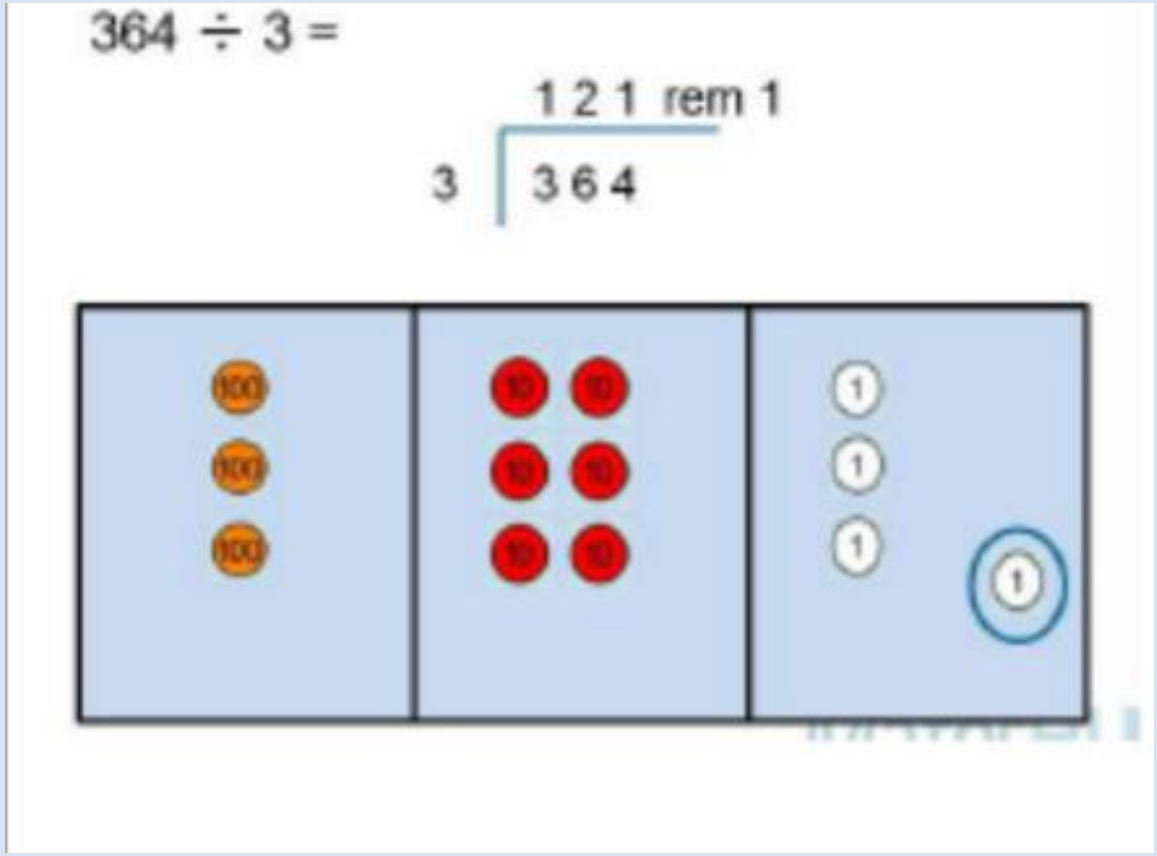


7 tens ÷ 3 = 2 tens r 1 ten

12 ones ÷ 3 = 4 ones

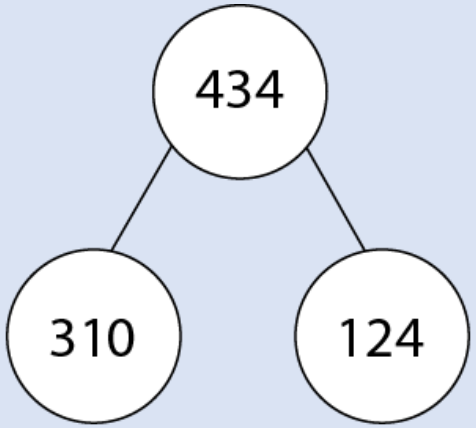
Written methods of division

- Short division



$$434 \div 31 = \boxed{14}$$

	× 31
1	31
2	62
3	93
4	124
5	155
6	186
7	217
8	248
9	279
10	310



310	÷	31	=	10
124	÷	31	=	4
434	÷	31	=	14

Long division

	× 31
1	31
2	62
3	93
4	124
5	155
6	186
7	217
8	248
9	279
10	310

$$
\begin{array}{r}
0\quad 1 \\
\hline
31\overline{)\,4\quad {}^{4}3\quad {}^{12}4}
\end{array}
$$

Extension by digging deeper

Year 3

Sophie has five coins in her pocket. How much money might she have?
What is the greatest amount she can have?
What is the least amount she can have?

If all the coins are different:
What is the greatest amount she can have?
What is the least amount she can have?

Year 4

Sally has 9 times as many football cards as Sam. Together they have 150 cards.
How many more cards does Sally have than Sam?

The bar model is a useful scaffold to develop fluency in this type of question.

Year 5

Sam and Tom have £67·80 between them.

If Sam has £6·20 more than Tom, how much does Tom have?

Year 6

Two numbers have a difference of 2·38. What could the numbers be if:

- the two numbers add up to 6?
- one of the numbers is three times as big as the other number?

Two numbers have a difference of 2·3. To the nearest 10, they are both 10.
What could the numbers be?

- Helps visualise the problem
- Has conceptual underpinning that we have to understand
- Is a way to communicate what the child has understood