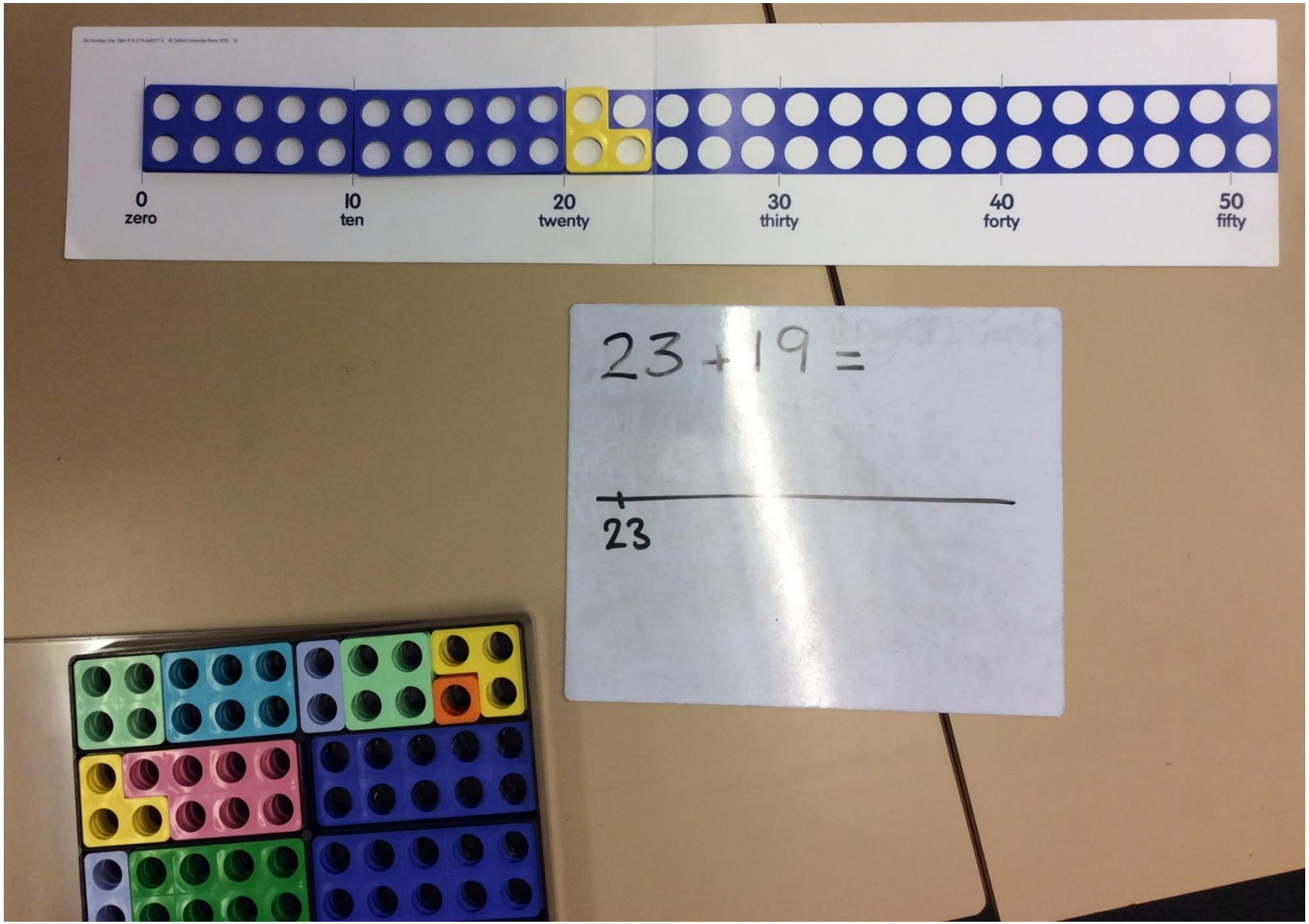
Parent Mathematics Workshops 2.2.16

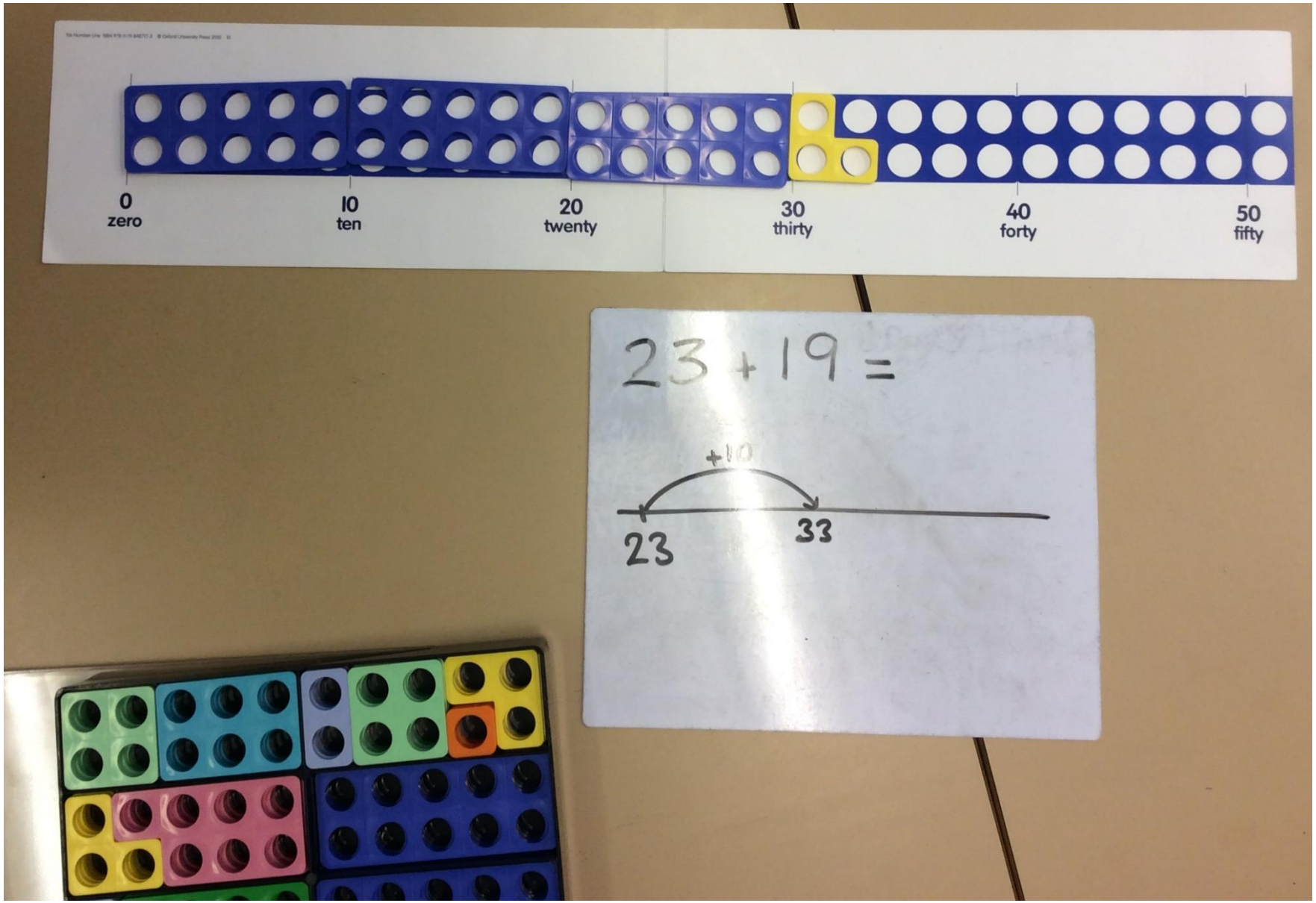
How we teach addition.

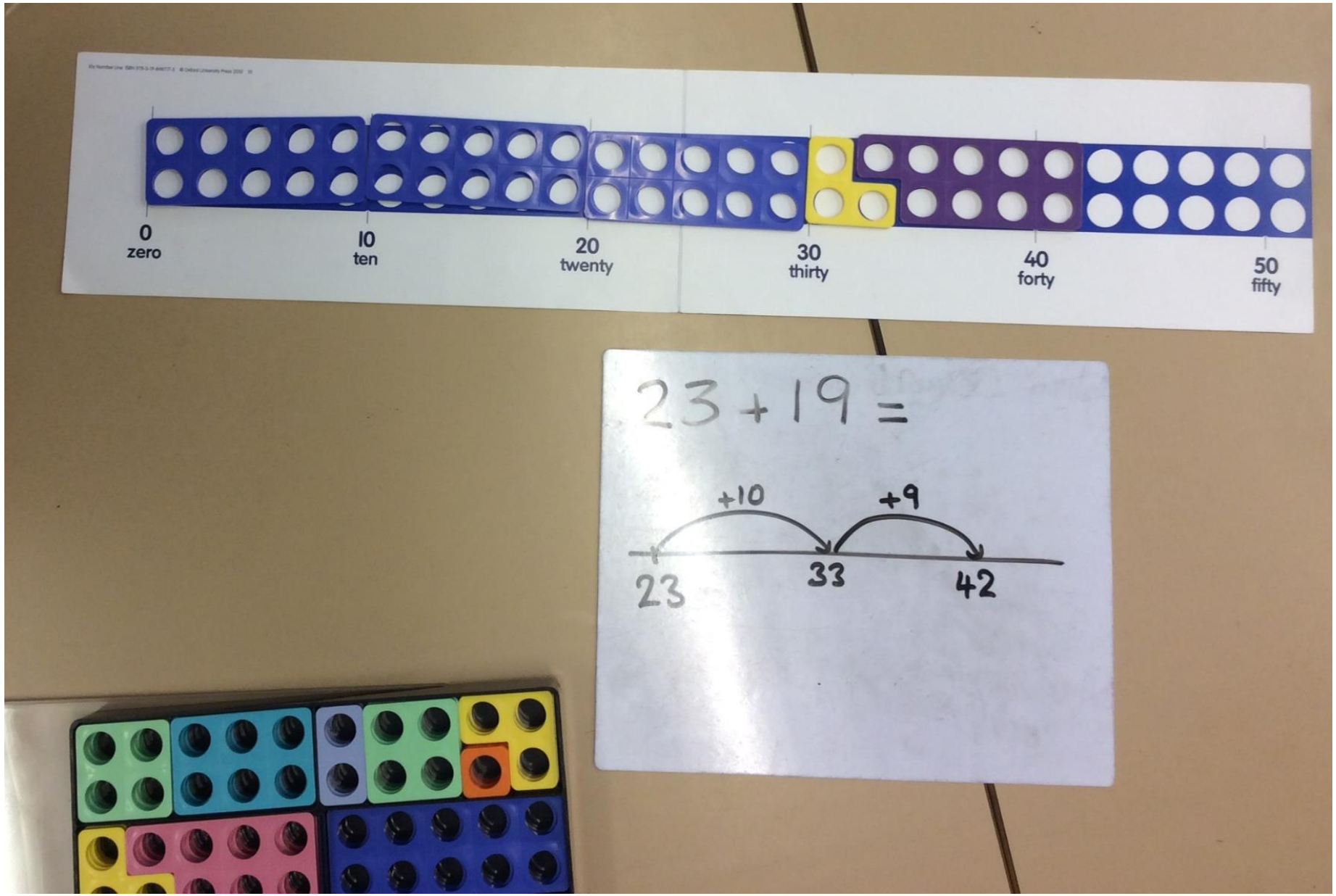
Mental arithmetic methods: addition.

32 + 41 =

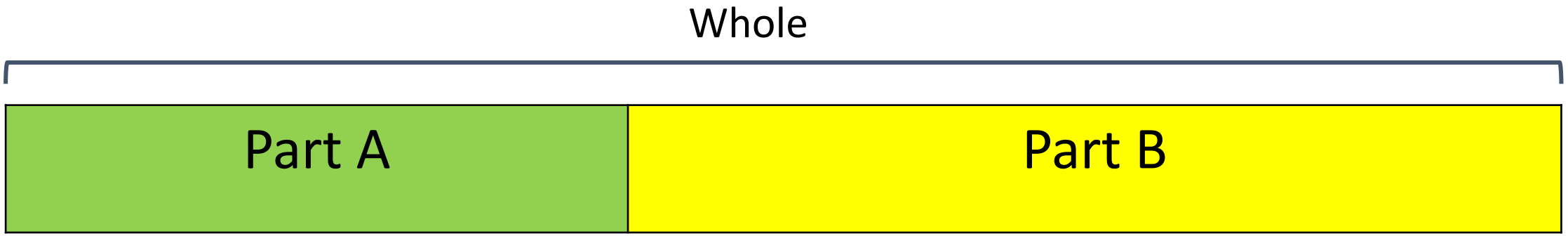
Numicon: addition




0
zero
10
ten
20
twenty
30
thirty
40
forty
50
fifty
23 + 19 =
+10
23
33


0
zero
10
ten
20
twenty
30
thirty
40
forty
50
fifty
23 + 19 =
+10
+9
23
33
42

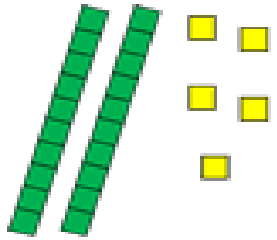
Part- whole addition / subtraction

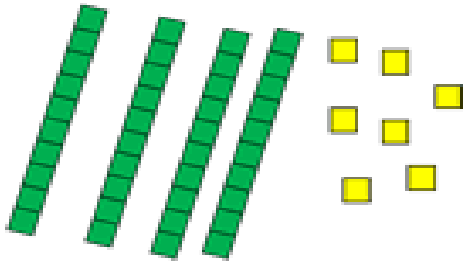


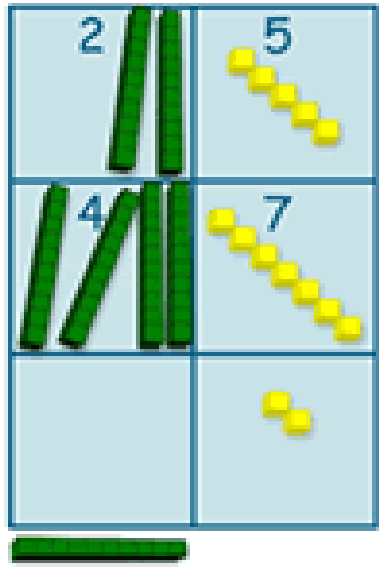
There are 45 children at St John's Infants and 175 at Springfield Juniors. How many children are there altogether?

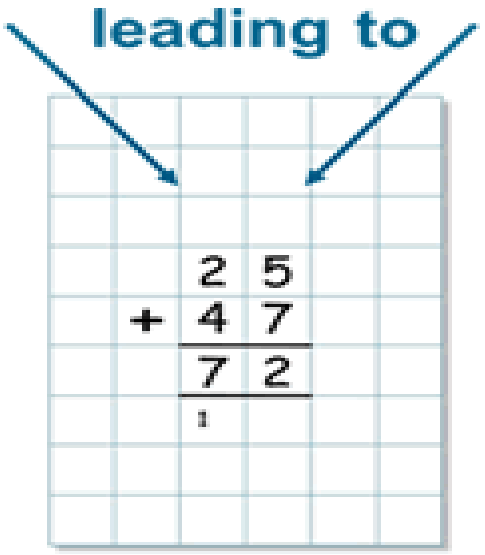
Singapore Bar (adapted from Erie 2 Math, 2012).

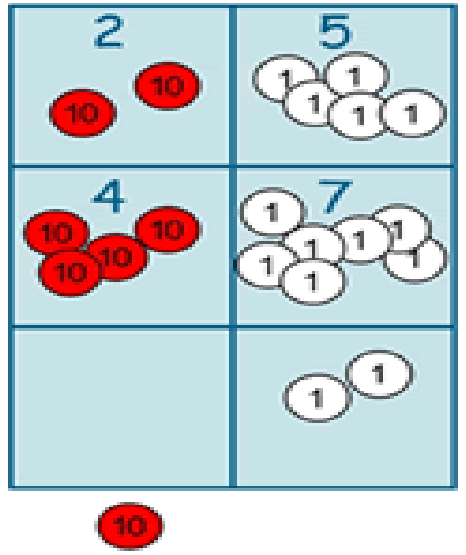
25 + 47











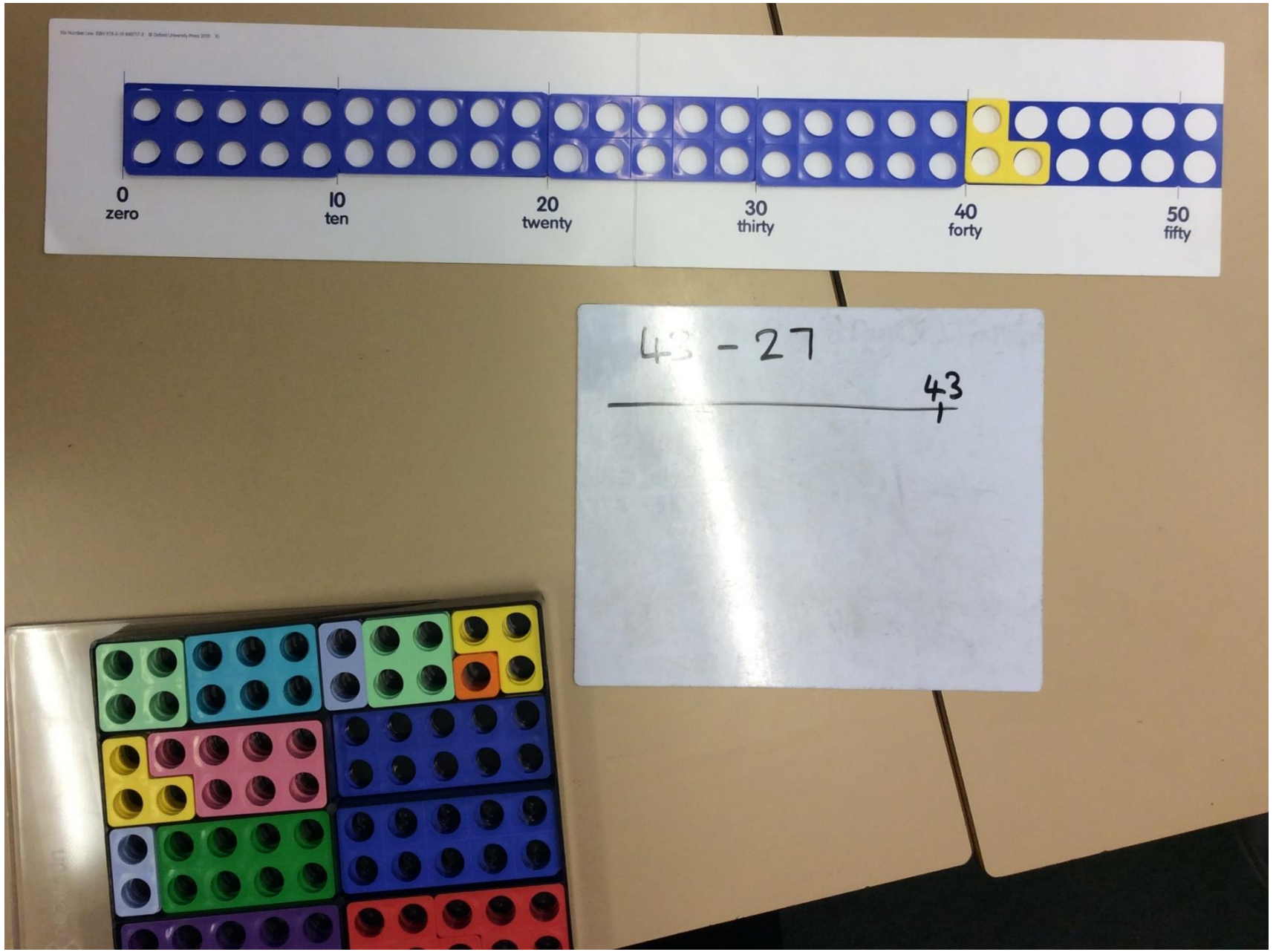
https://www.ncetm.org.uk/resources/43197

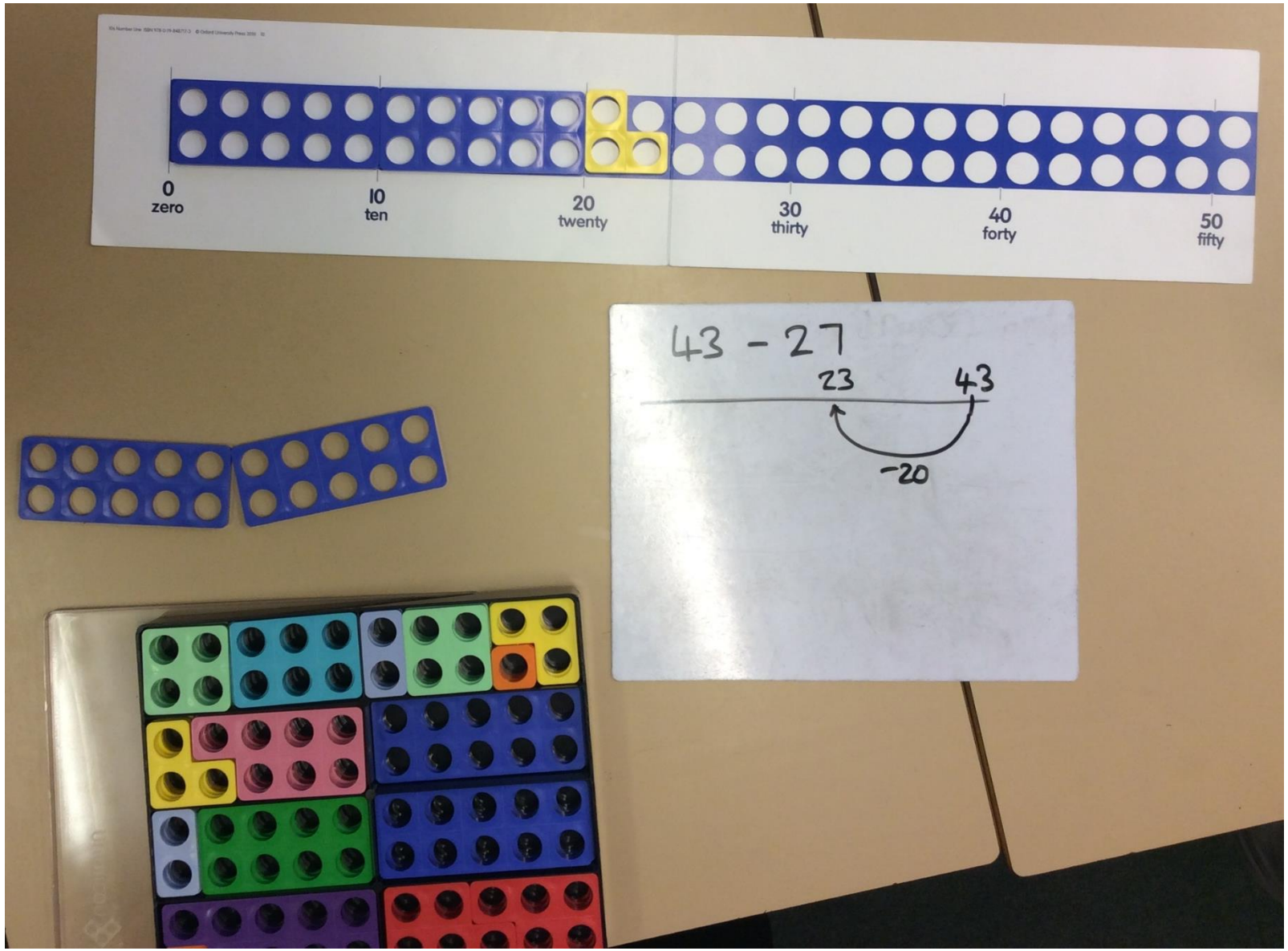
How we teach subtraction.

Mental arithmetic methods: subtraction.

$51 - 38 =$

Numicon: subtraction

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forty
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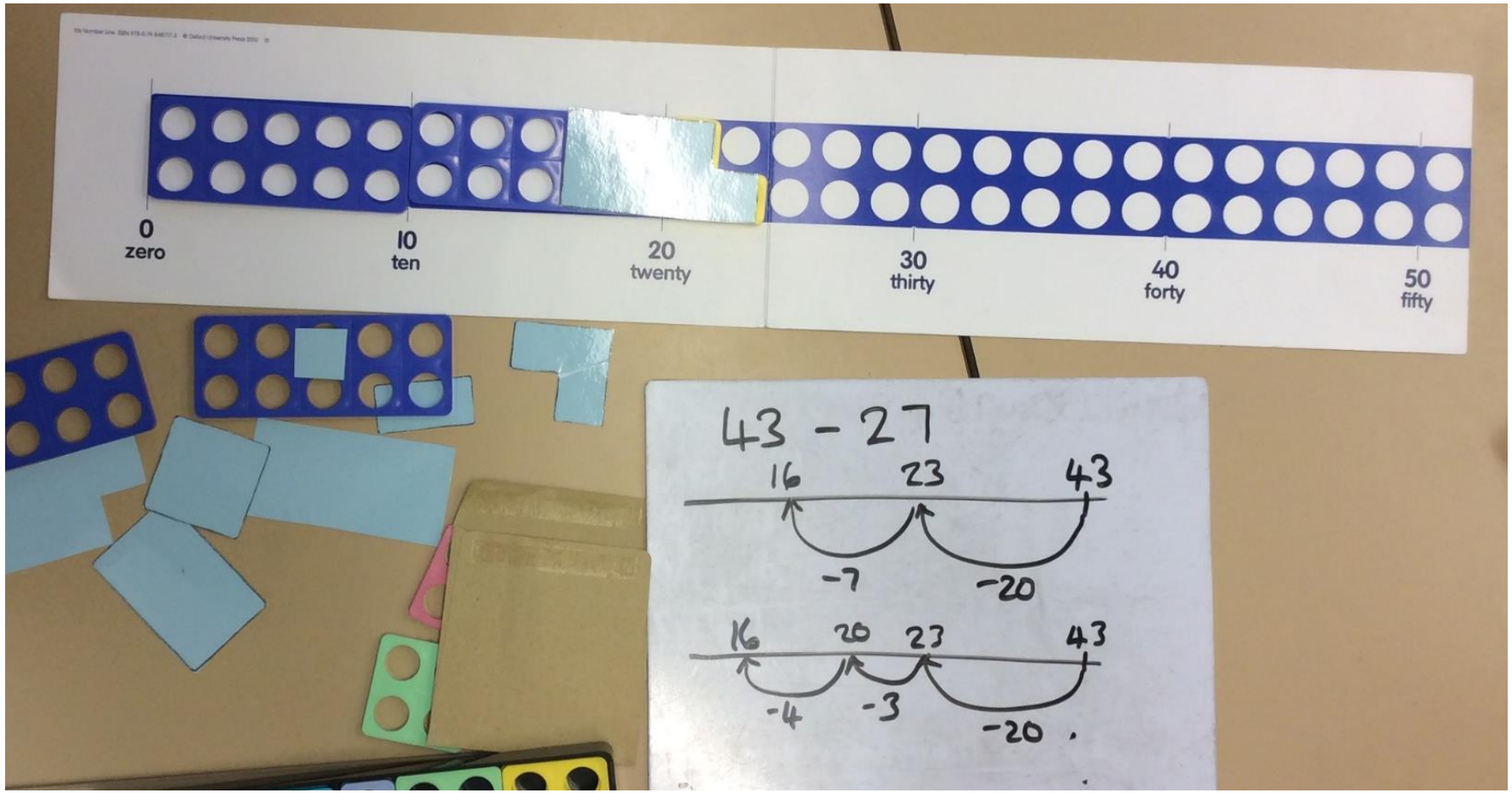
fifty
43 - 27
23
43
-20


0
zero
10
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fifty
43 - 27
16
23
43
-7
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16
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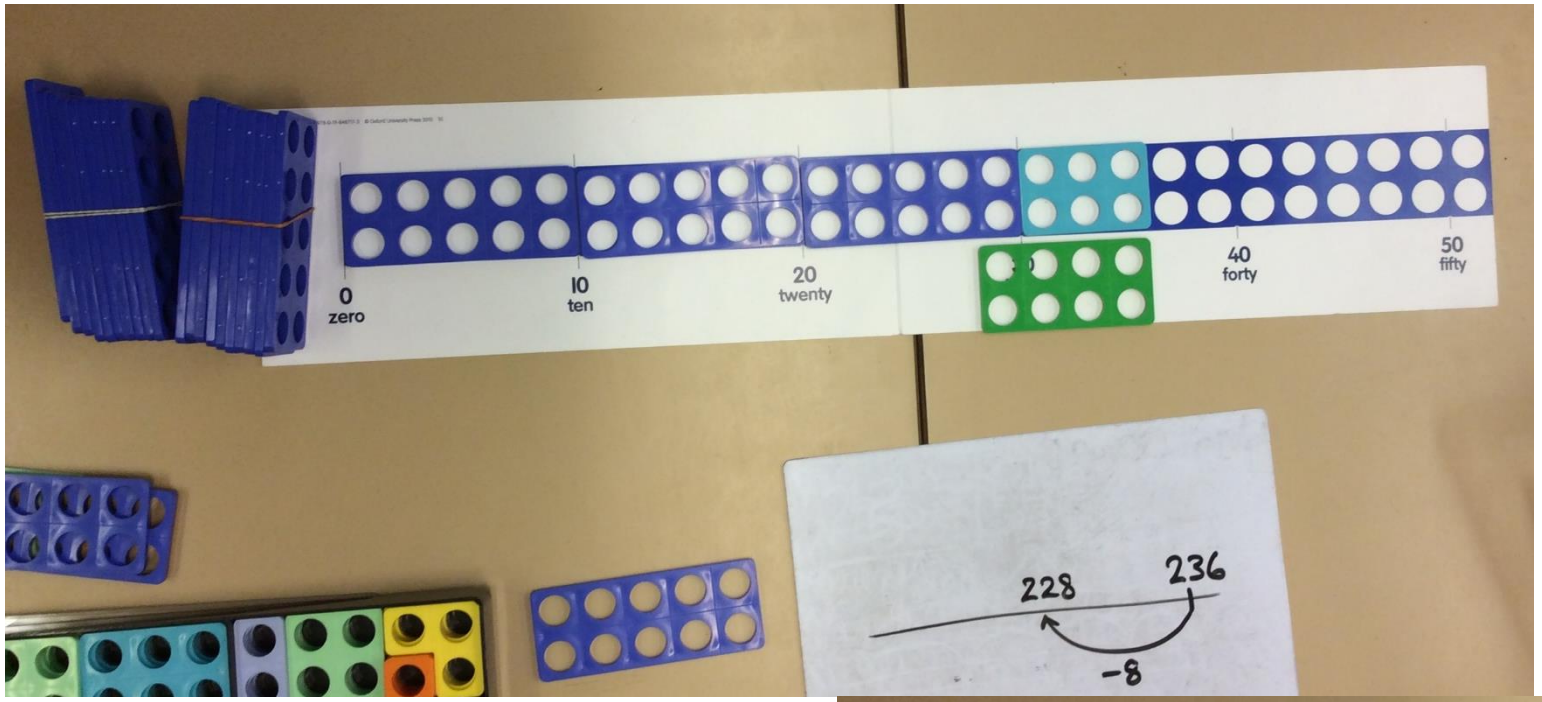
23
43
-4
-3
-20


0
zero
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twenty
40
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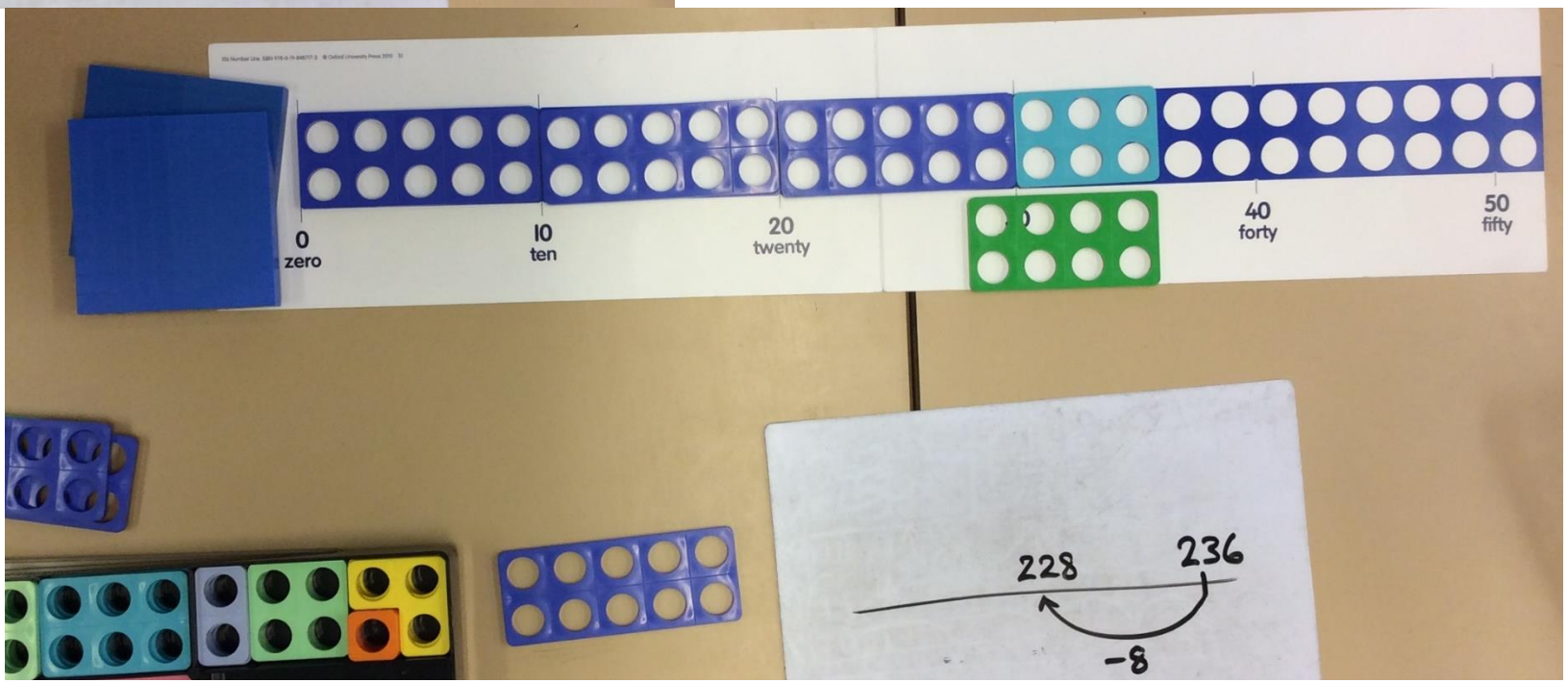
fifty
228
236
-8


0
zero
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40
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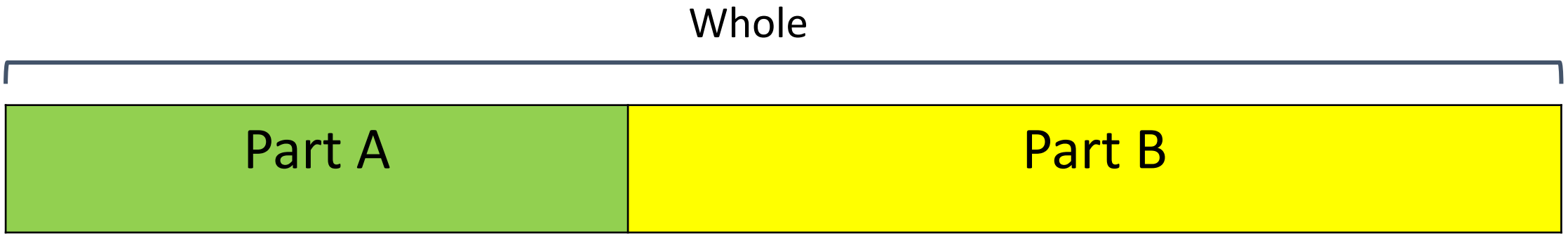
50
fifty
228
236
-8

Part- whole addition / subtraction



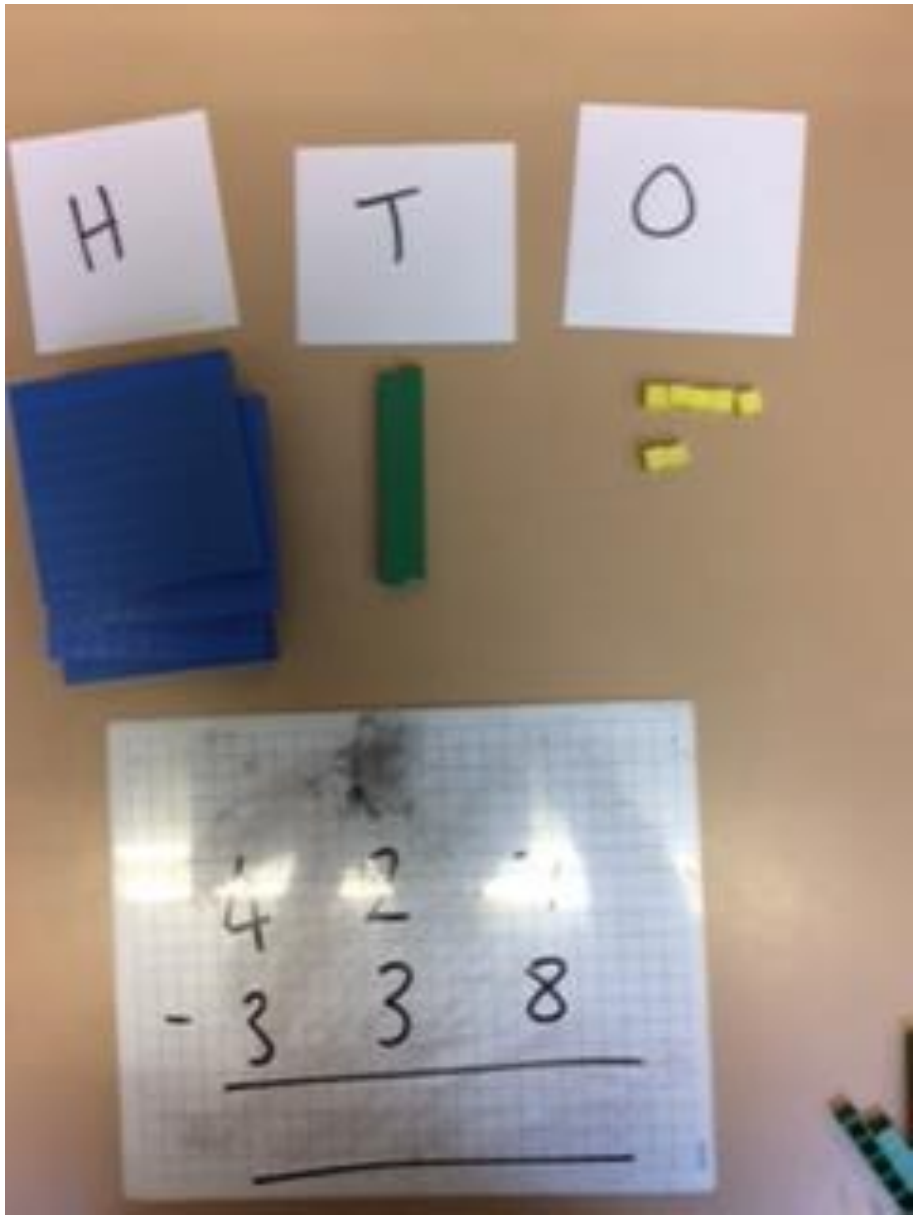
Jack has £250. He spends £70. How much does he now have?

Singapore Bar (adapted from Erie 2 Math, 2012).

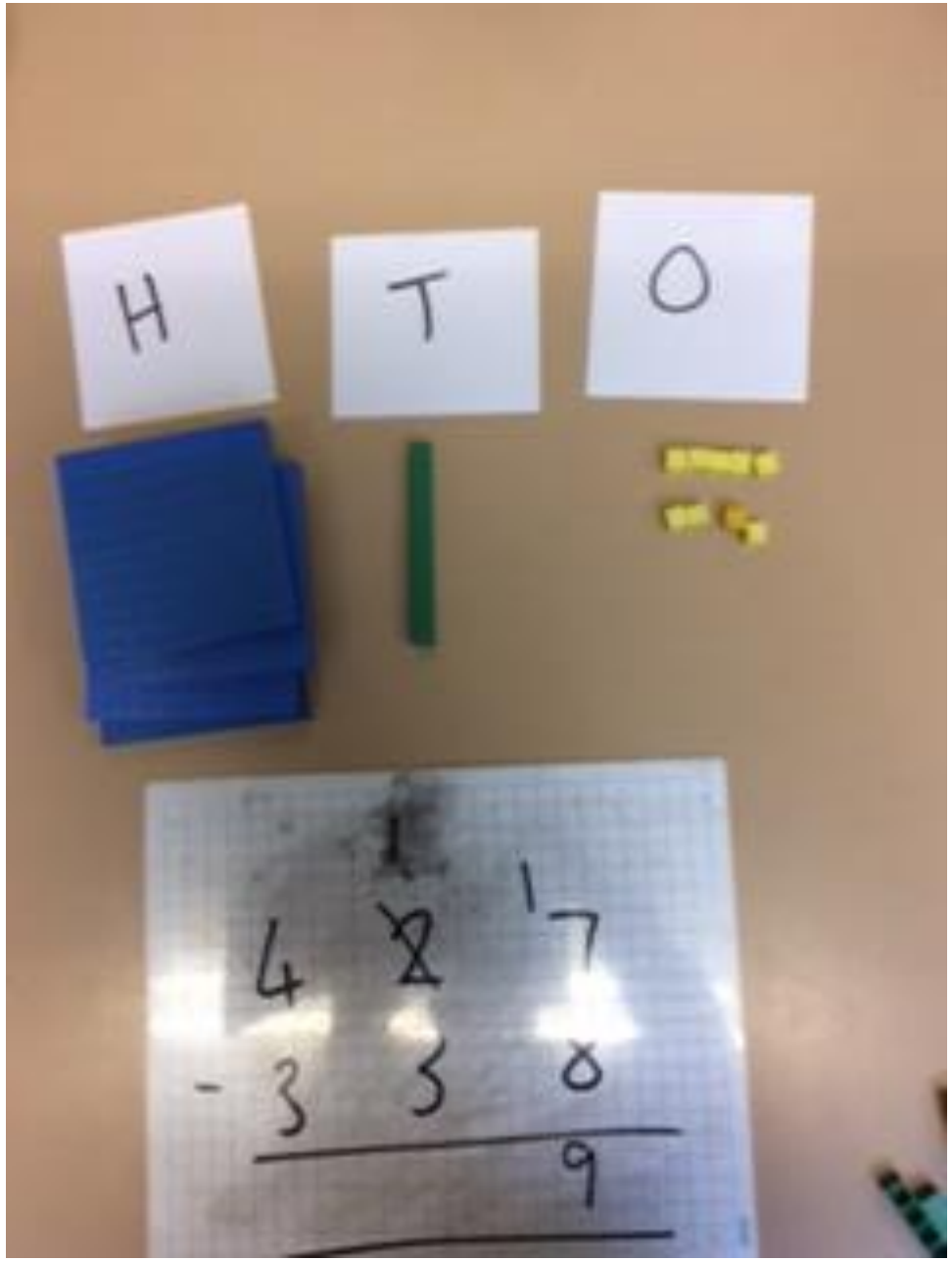
Comparison: subtraction

Martin has saved £6.78. Matthew has saved £4.69. How much more money does Martin have?

Singapore Bar (adapted from Erie 2 Math, 2012).


H
T
O
4 2
- 3 3 8


H
T
O
4 8 7
- 3 3 8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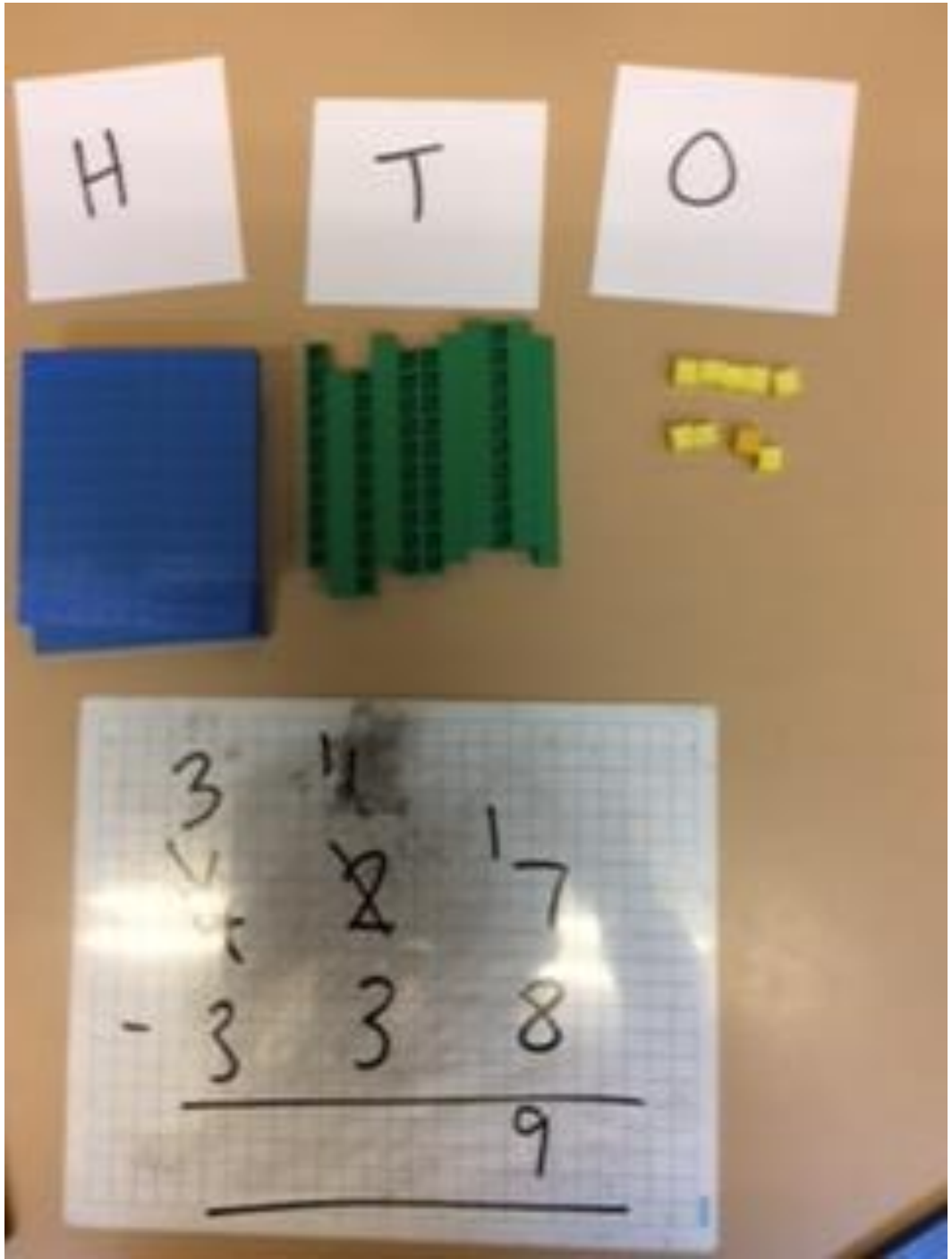
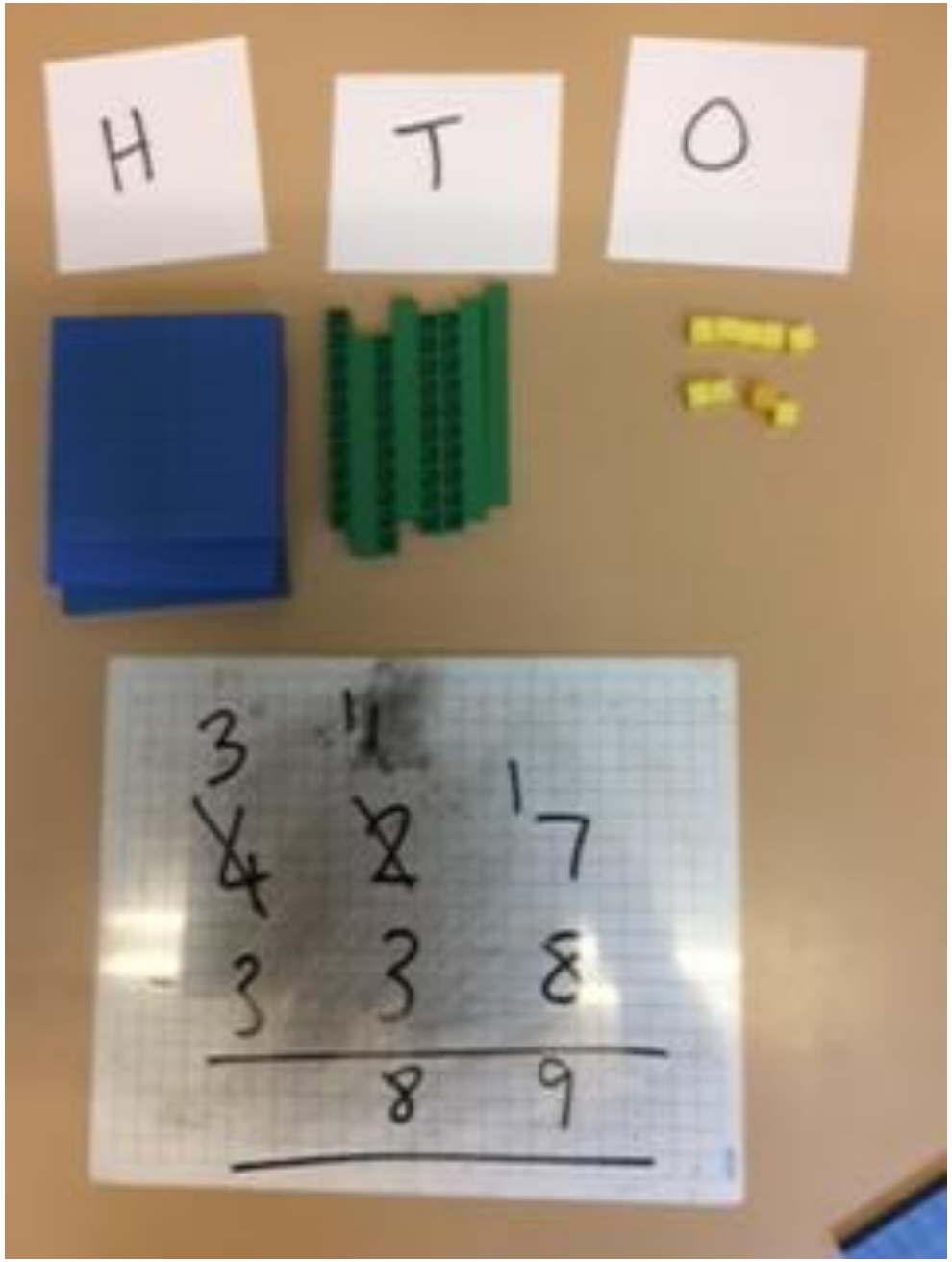
1
4 8 7
- 3 3 8
9


H
T
O
3 11
2 1 7
- 3 3 8
9


H
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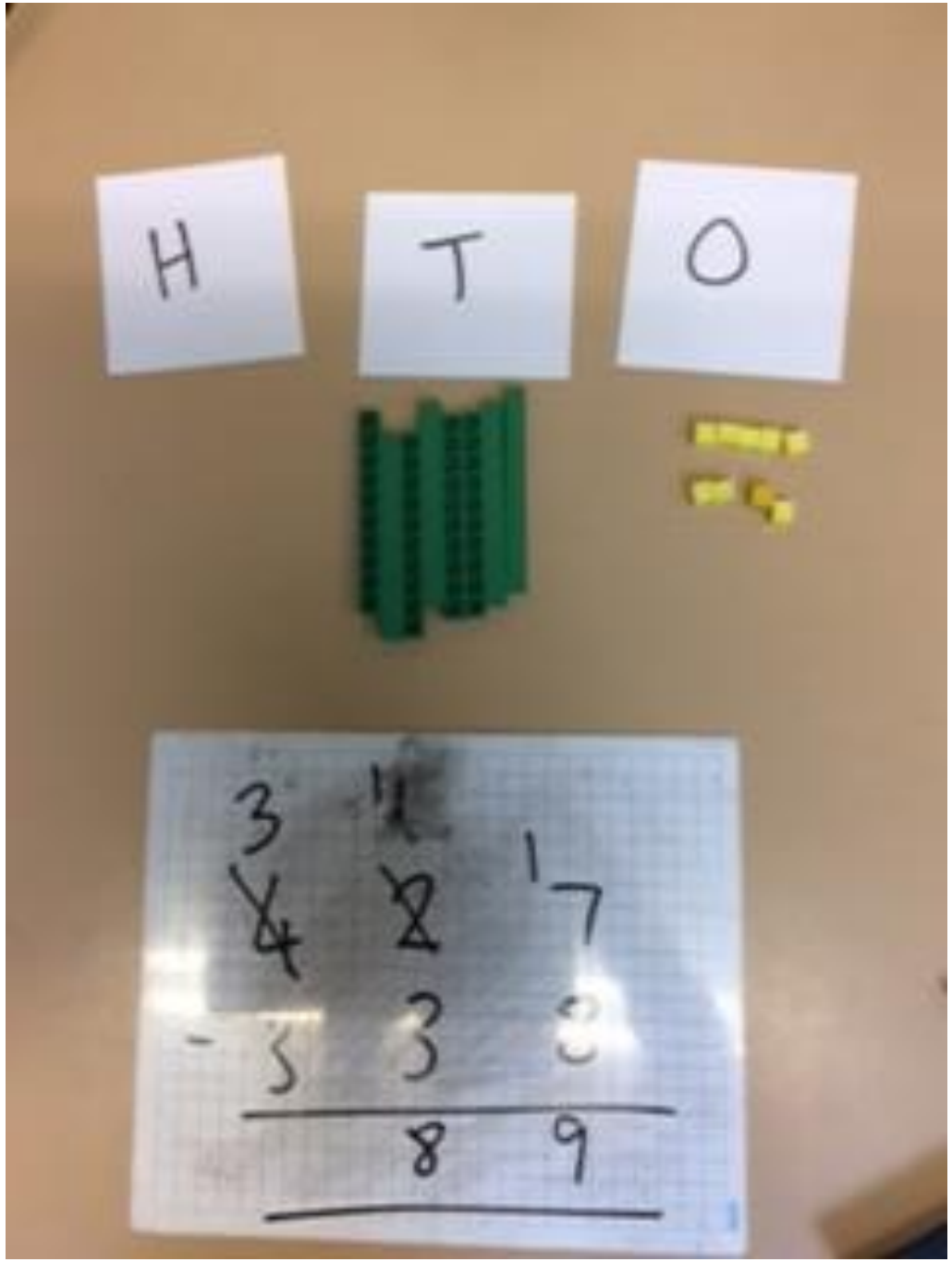
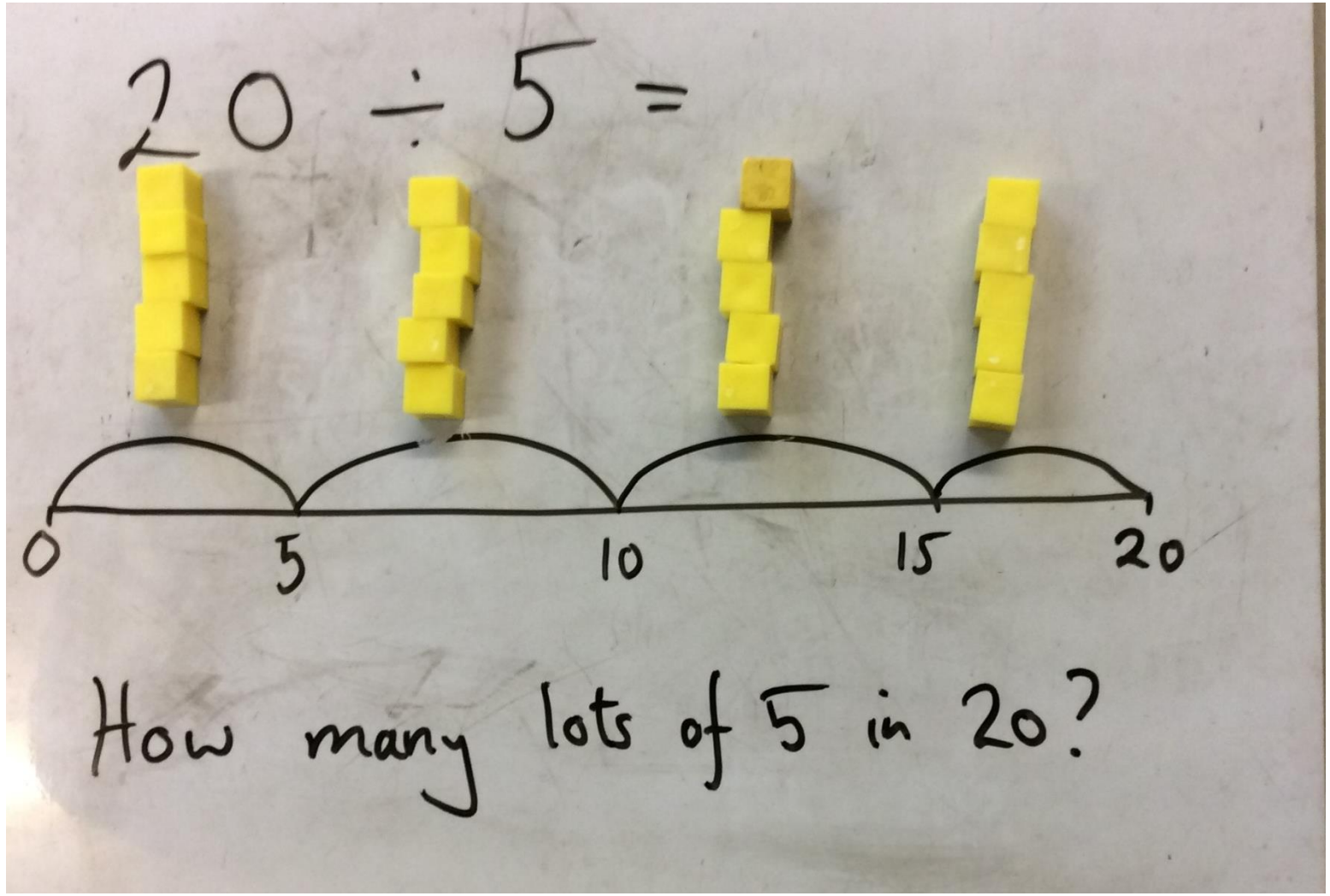
4 8 7
3 3 8
8 9

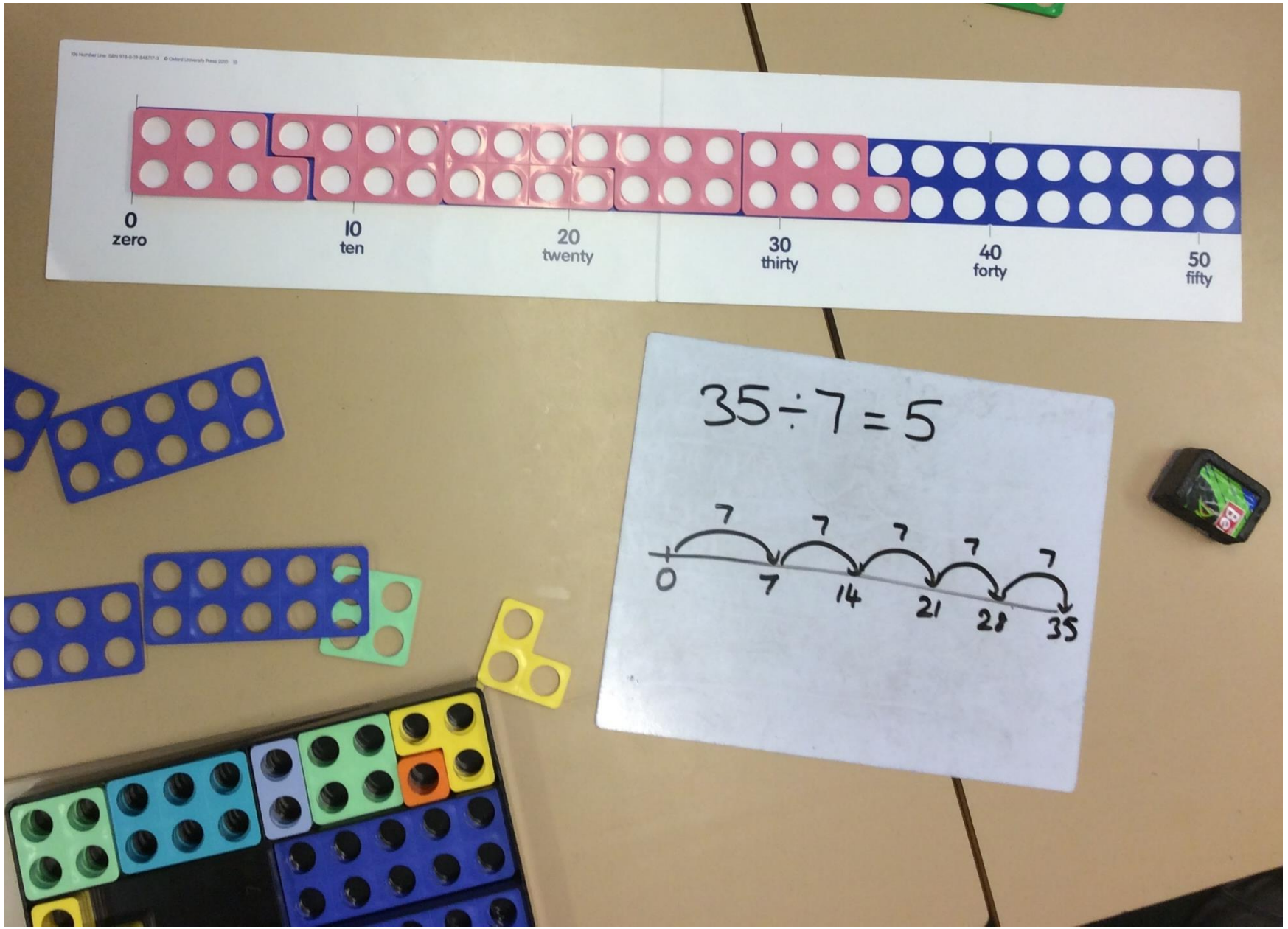

H
T
O
3 11
4 2 17
3 3 8
8 9

How we teach division.

Using diennes for division
Use with number lines



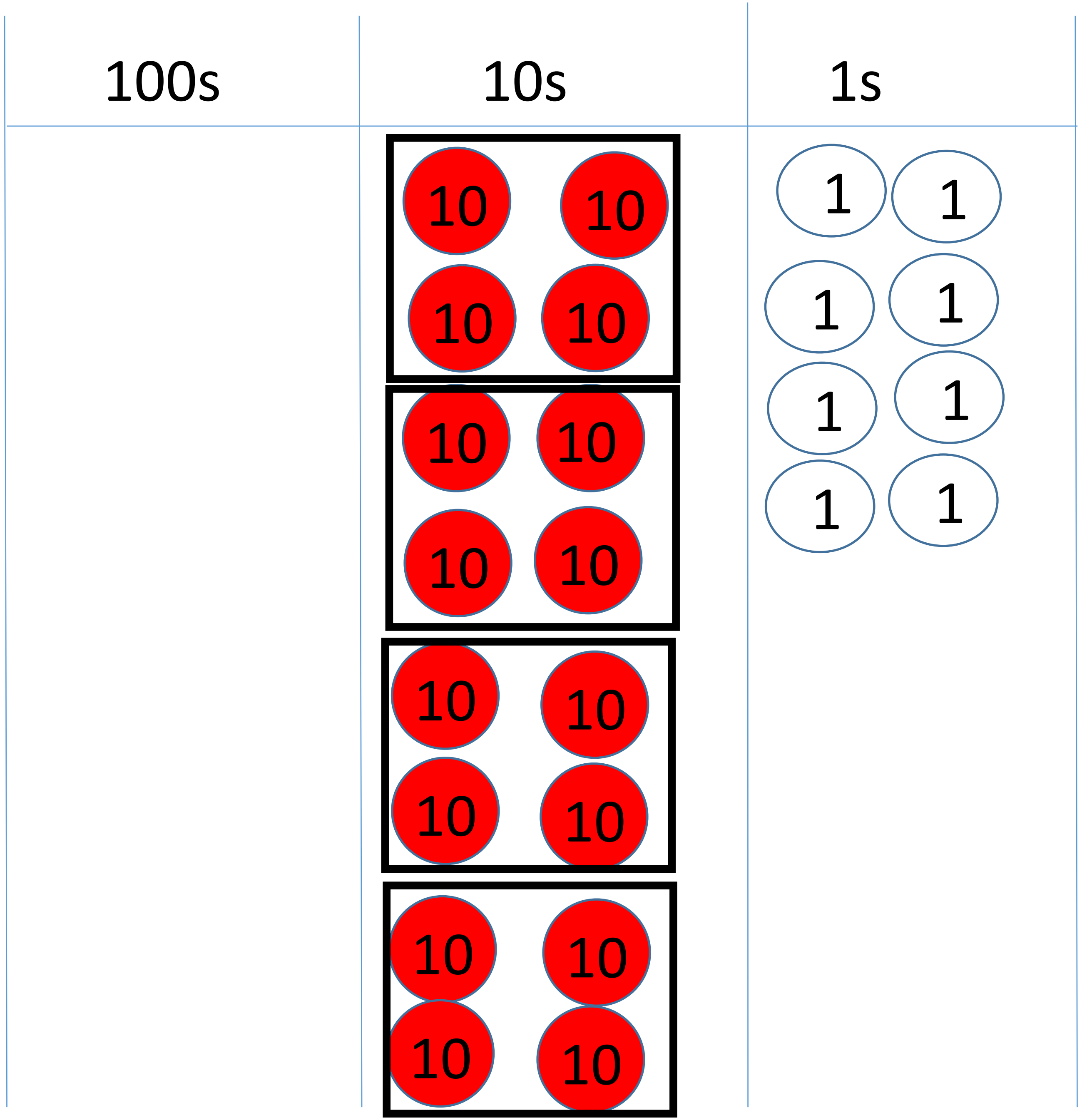
Numicon: division

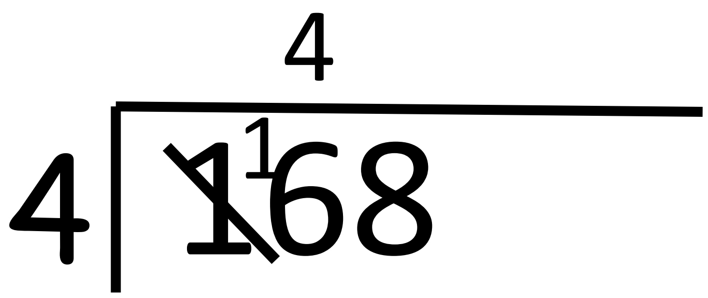


100s	10s	1s
100	10 10 10 10 10 10	1 1 1 1 1 1 1 1

$$4\overline{)168}$$

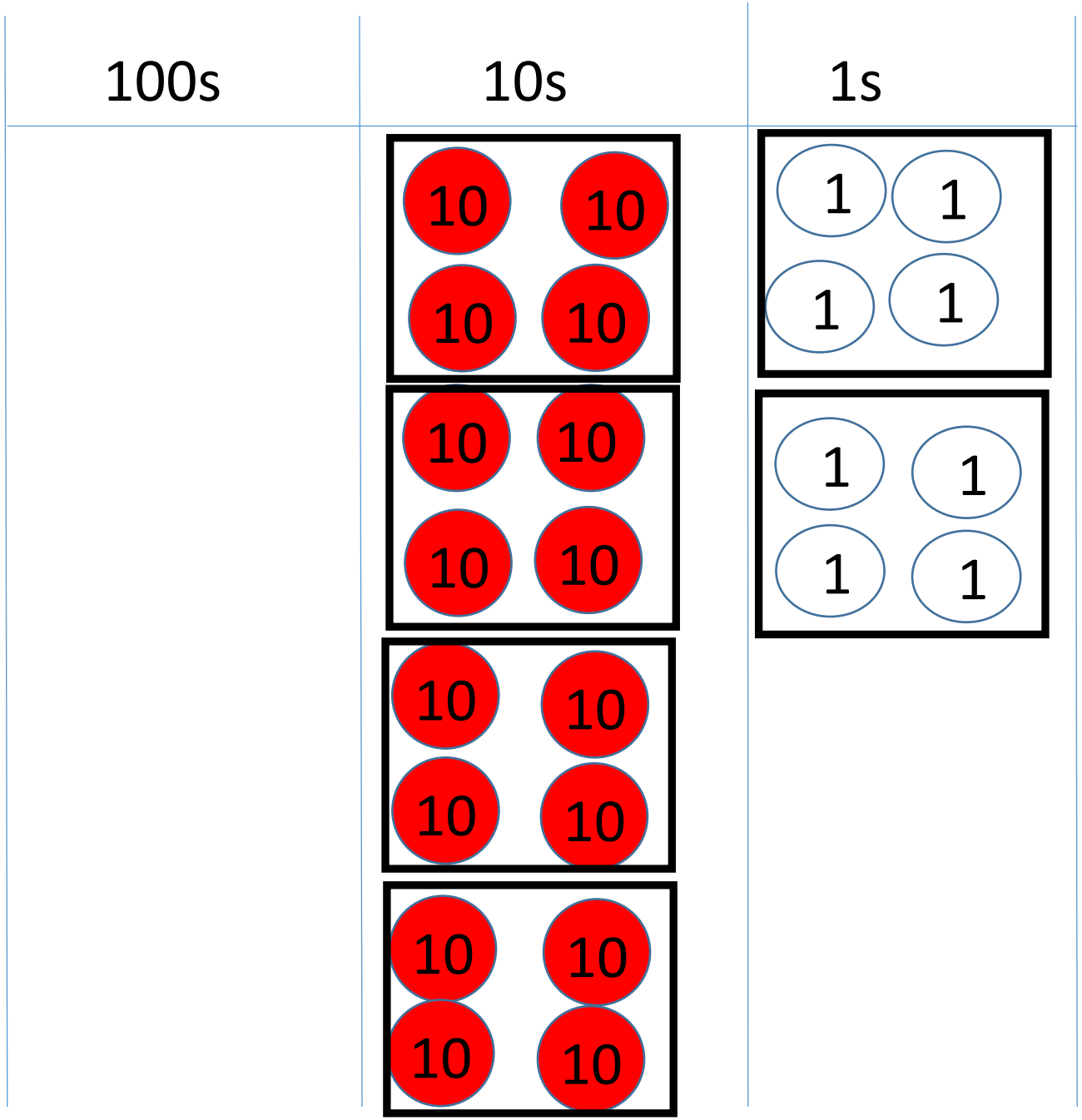
Idea for short division with place value counters adapted from Jane Gill's INSET on 16th November at Lowe's Wong Juniors.





Exchange the 100 for 10 tens.

How many groups of 4 can be made with 16 tens?



$$\begin{array}{r} 42 \\ 4\overline{)168} \end{array}$$

How many groups of 4 can be made with 8 ones?

260 ÷ 5 =

147 ÷ 7 =

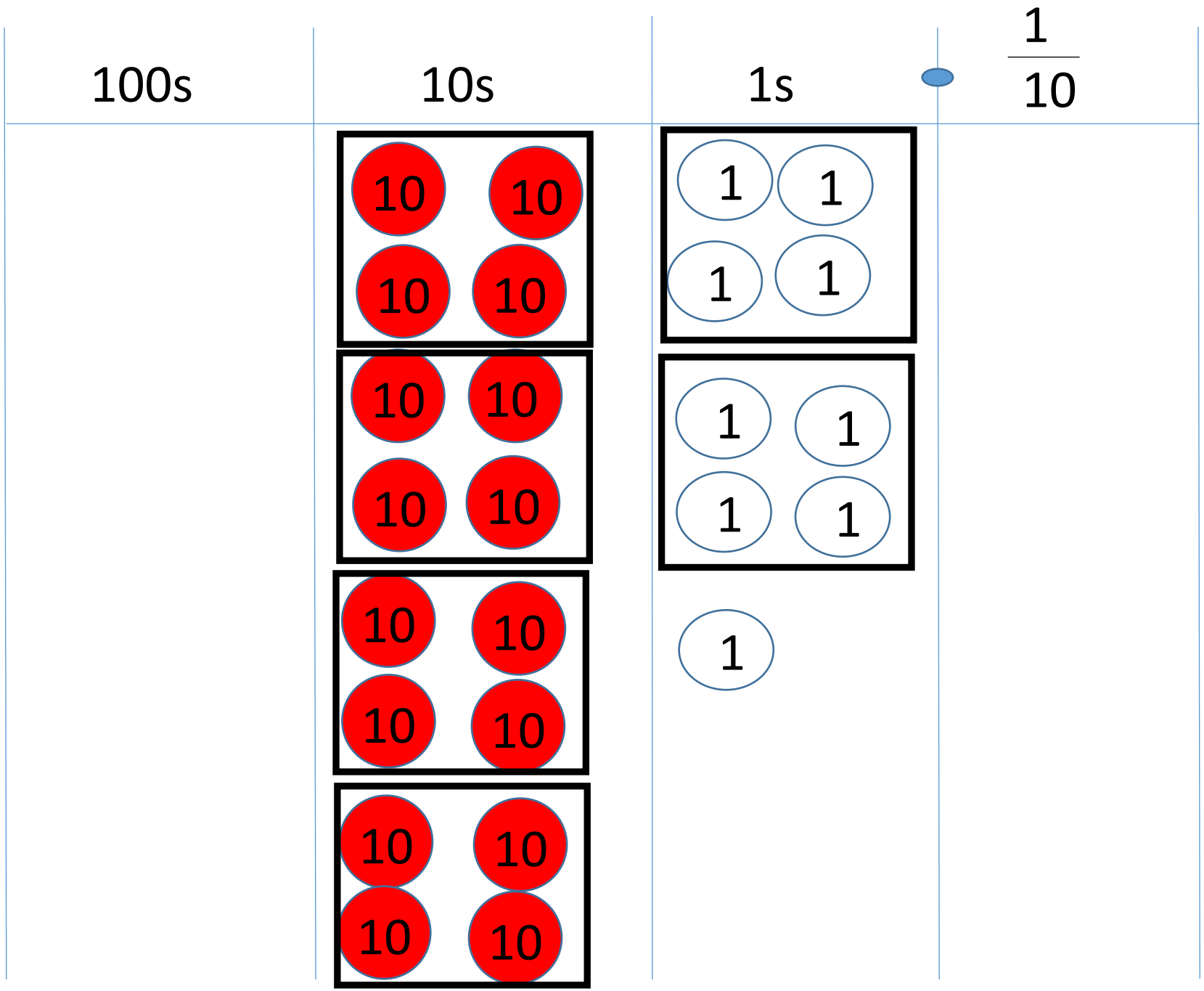
1326 ÷ 6 =

5256 ÷ 4 =

2532 ÷ 6 =

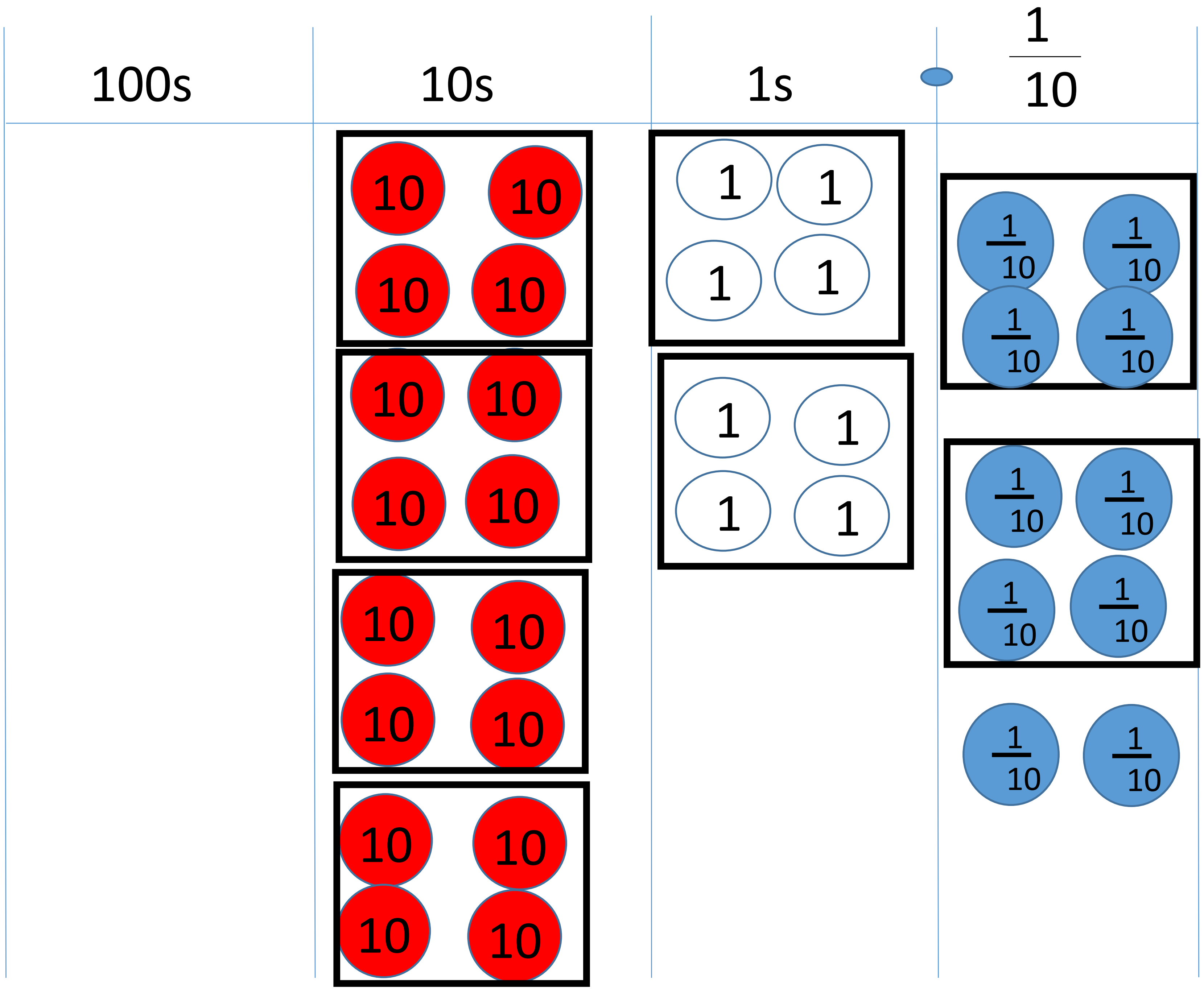
Here are a few to have a go at.

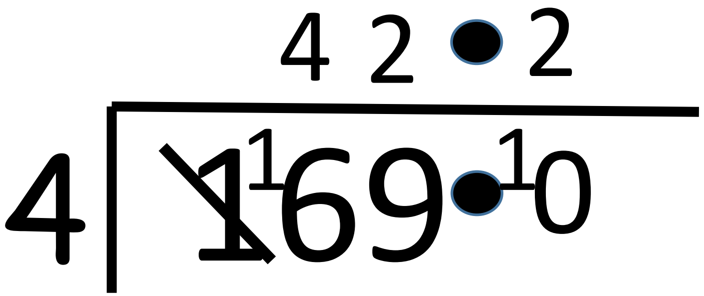
When designing questions for children, be careful, otherwise they can end up exchanging 4 tens for 40 ones etc….can take a while!



$$4\overline{)169}$$

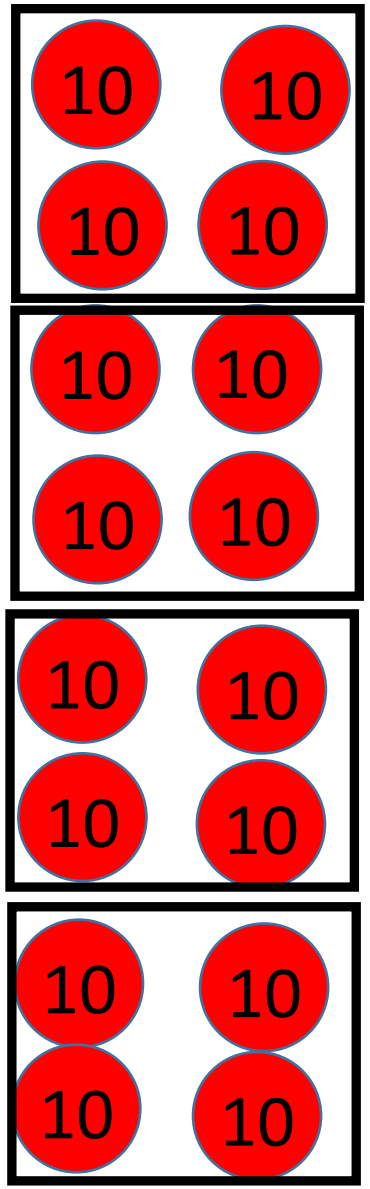
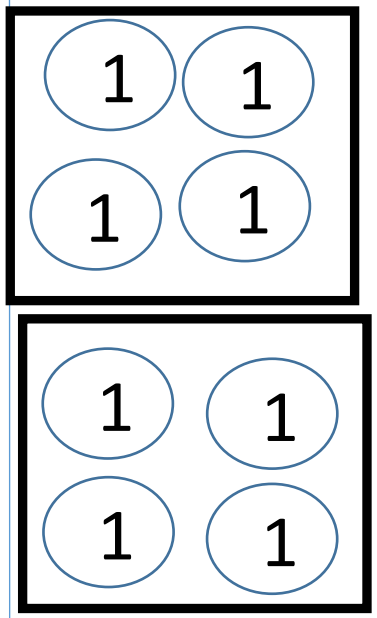
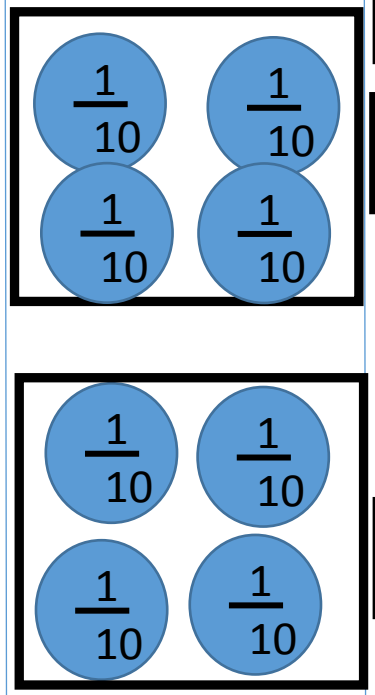
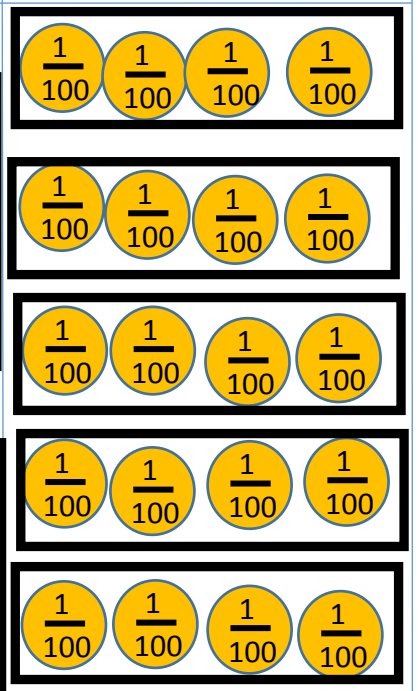
How many groups of 4 can be made with 9 ones?





Exchange the one
For 10 tenths.

How many groups of
4 can be made with
10 tenths?

100s	10s	1s	$\frac{1}{10}$	$\frac{1}{100}$
Exchange the two tenths 20 hundredths. How many groups of 4 can be made with 20 hundredths?				

Language after decimal point.

Forty two and 25 hundredths.

Or

Forty two and 2 tenths and 5 hundredths.

$$4\overline{)169.00}\quad 42.25$$

Long division

432 ÷ 15 becomes

			2	8	r 12
1	5	4	3	2	
		3	0	0	
		1	3	2	
		1	2	0	
			1	2	

Answer: 28 remainder 12

432 ÷ 15 becomes

			2	8	
1	5	4	3	2	
		3	0	0	15×20
		1	3	2	
		1	2	0	15×8
			1	2	

$\frac{12}{15} = \frac{4}{5}$

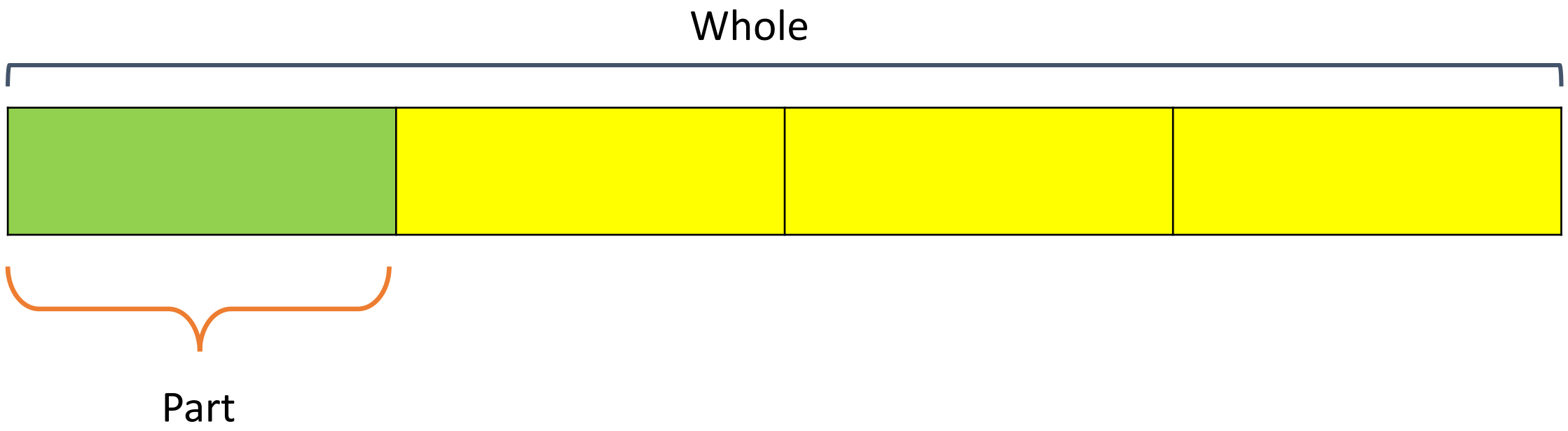
Answer: $28\frac{4}{5}$

432 ÷ 15 becomes

			2	8 ·	8
1	5	4	3	2 ·	0
		3	0	↓	↓
		1	3	2	
		1	2	0	
			1	2	0
			1	2	0
					0

Answer: 28·8

Part-whole multiplication / division / fractions



Singapore Bar (adapted from Erie 2 Math, 2012).

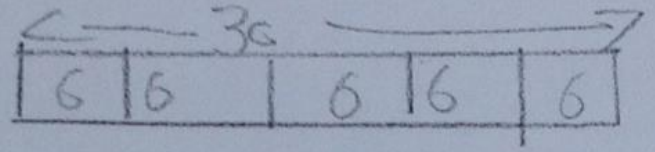
Comparison: multiplication / division

- If eight apples cost £2, how much would two apples cost?

Singapore Bar (adapted from Erie 2 Math, 2012).

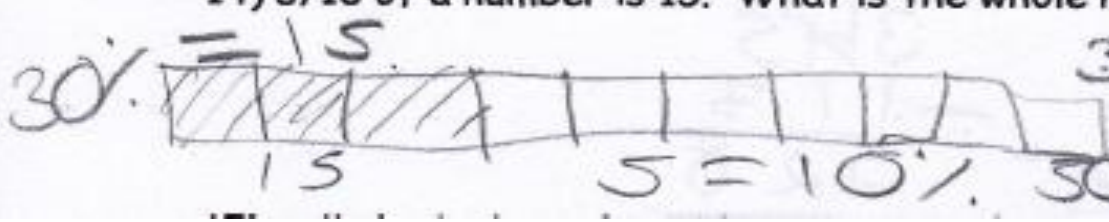
9) Mr Smith had a piece of wood that measured 30 cm. He cut it into 5 equal pieces. How long was each piece?

$5\overline{)30}$ → 06



ANS = 6 ✓

14) 3/10 of a number is 15. What is the whole number?



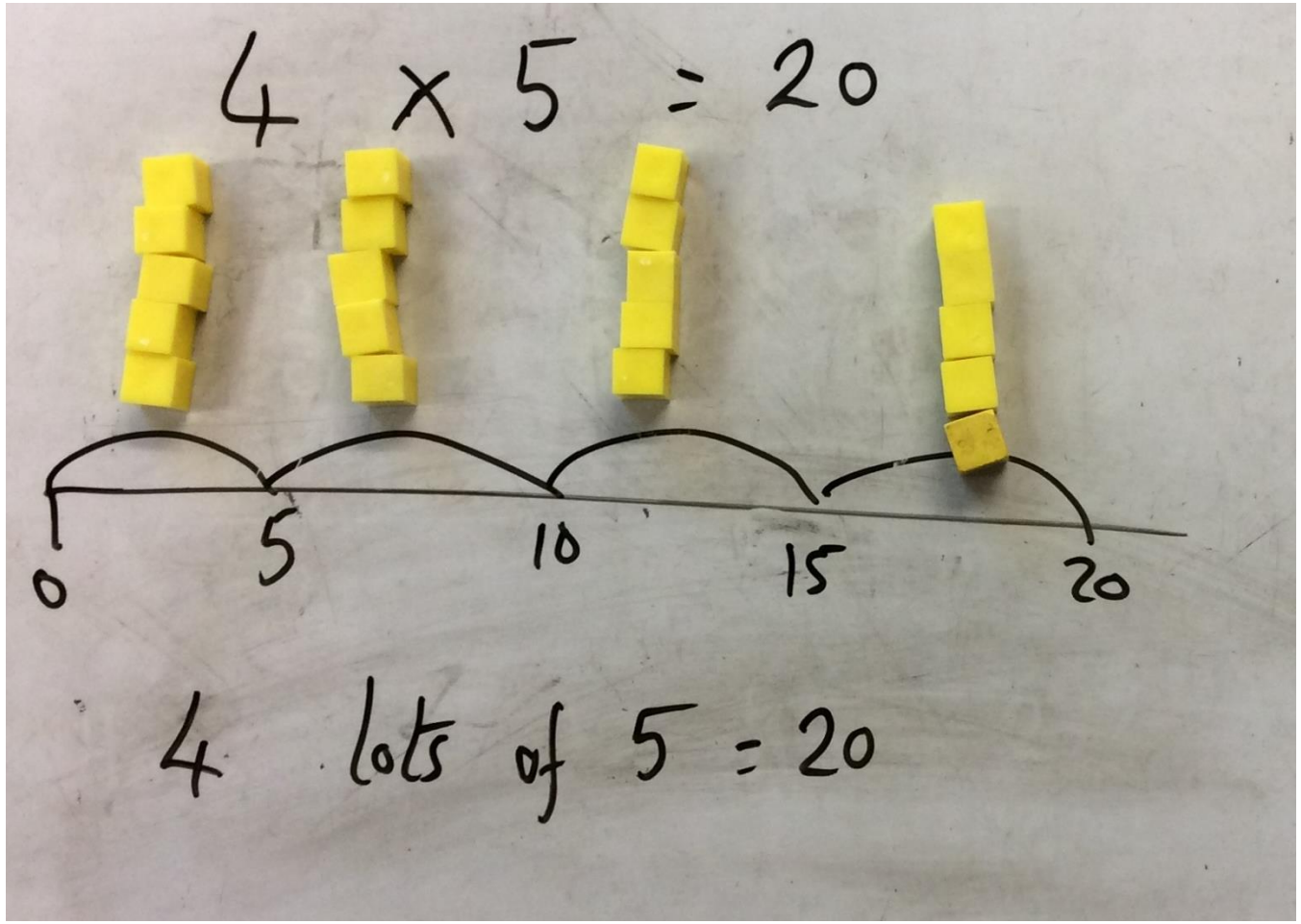
$3\overline{)15}$ → 5

$\frac{15}{3} = 5 \times 10 = 50$

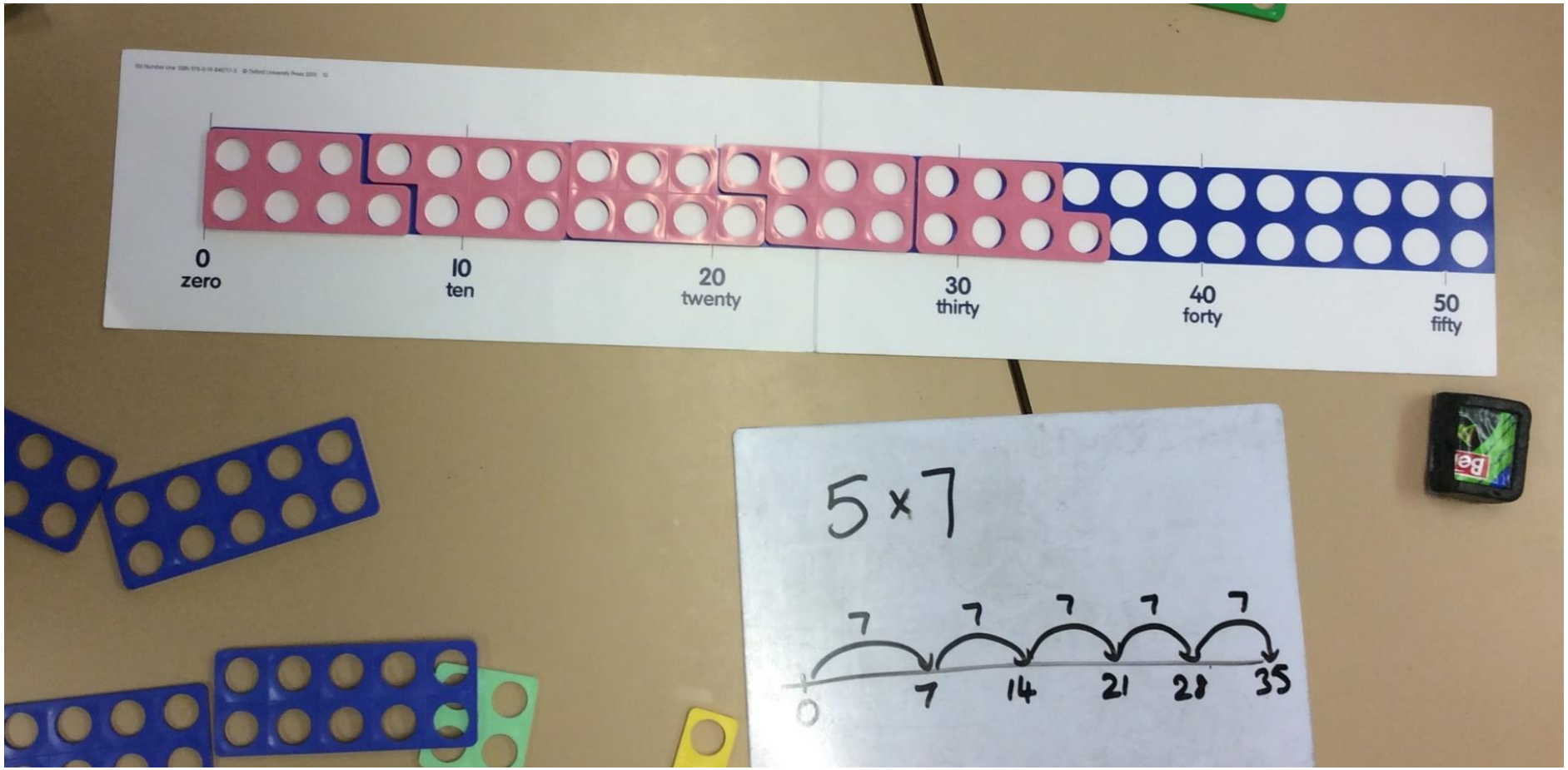
Ans = 50 ✓

How we teach multiplication.

Diennes for multiplication



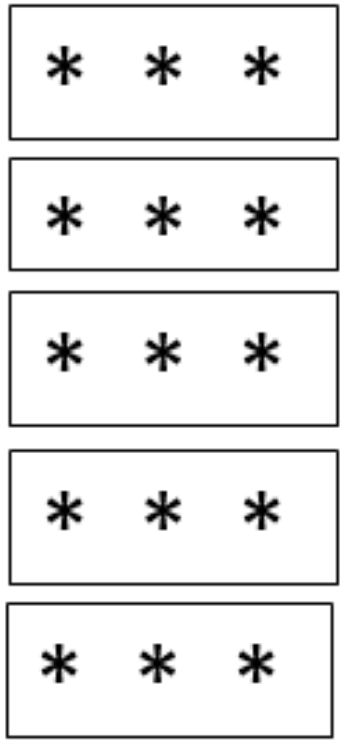
Numicon: multiplication



Arrays

3 groups of 5 (3 x 5)

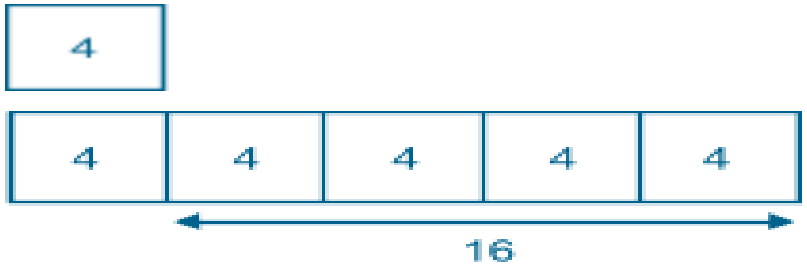
5 groups of 3 (5 x 3



- Arranging numbers in this way allows children to develop an understanding of the commutatative nature of multiplication eg the order of 3 and 5 does not change the answer.

Example from Southwell Schools' Shared Calculation Policy.

Peter has four books. Harry has five times as many books as Peter. How many more books does Harry have?



https://www.ncetm.org.uk/resources/44568

"Tens and Units" x "Tens and Units"

PARTITION *both* the number into Tens and Units

23 x 45 = ?

(23 = 20 + 3 45 = 40 + 5)

	20	3
40	800	120
5	100	15
	900	135

```
  900
+ 135
-----
 1035
```

23 x 45 = 1035

Jottings

4 x 2 = 8
40 x 2 = 80
40 x20 = 800

4 x 3= 12
40 x 3 = 120

5 x 2 = 10
5 x 20 = 100

24 × 6 becomes

	2	**4**
×		**6**
1	**4**	**4**
	2	

Answer: 144

342 × 7 becomes

	3	**4**	**2**
×			**7**
2	**3**	**9**	**4**
	2	1	

Answer: 2394

2741 × 6 becomes

	2	**7**	**4**	**1**
×				**6**
1	**6**	**4**	**4**	**6**
	4	2		

Answer: 16 446

National Curriculum, 2014.
https://www.gov.uk/government/collections/national-curriculum

24 × 16 becomes

	2	
	2	**4**
×	**1**	**6**
2	**4**	**0**
1	**4**	**4**
3	**8**	**4**

Answer: 384

124 × 26 becomes

	1	2	
	1	**2**	**4**
×		**2**	**6**
2	**4**	**8**	**0**
	7	**4**	**4**
3	**2**	**2**	**4**
1	1		

Answer: 3224

124 × 26 becomes

	1	2	
	1	**2**	**4**
×		**2**	**6**
	7	**4**	**4**
2	**4**	**8**	**0**
3	**2**	**2**	**4**
1	1		

Answer: 3224

National Curriculum, 2014.
https://www.gov.uk/government/collections/national-curriculum

References:

Erie 2 Math, The Bar Model-Singapore Math Model Method, 2012. http://e2math.weebly.com/models-to-support-thinking/bar-model-singapore-math-model-method {Accessed on 24.12.15}

Southwell Schools' Shared Calculation Policy

National Centre for Excellence in the Teaching of Mathematics (NCETM), 2014. The Bar Model. https://www.ncetm.org.uk/resources/44568

National Centre for Excellence in the Teaching of Mathematics (NCETM), 2014, Primary and Early Years Magazine 58. https://www.ncetm.org.uk/resources/43197

National Curriculum, 2014. https://www.gov.uk/government/collections/national-curriculum