Which is the odd one out?

23 20 15 25

Mathematics @ Merley

Year 4
Parent Information Session

Maths — No Problem!
Textbook 4A
Singapore Maths
English National Curriculum 2014
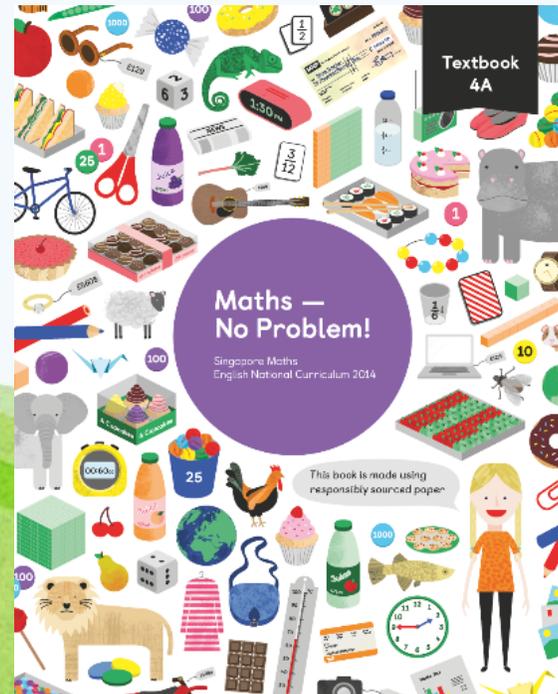
MATHS NO PROBLEM!

WIMBORNE Academy Trust

Aims for this session

1. Background to why we have changed our approach.
2. Understand the new approach to teaching mathematics in year 4.
3. Understand the format of a typical lesson.
4. How you can help at home.

Background

➢ Our children needed to develop their mental maths and problem solving skills.

➢ New Curriculum and Ofsted framework were introduced, and we needed to provide the children with a 'Mastery' curriculum.

Mastery

A mastery curriculum

- The national curriculum is designed to raise standards with the aim that the majority of children will achieve mastery of the subject. This is mastery of the objectives for their year group. The expectation is that the majority of children will move through the objectives at broadly the same pace.

- Progress will be based on the security of pupils understanding and their readiness to move on.

- Children who grasp concepts quickly will be challenged through rich and sophisticated problems, before acceleration through new content.

'' It is better to solve 1 problem in 5 different ways, than solve 5 different problems the same way.''

MATHS ⊠
NO PROBLEM!

Textbook
4A

Maths —
No Problem!

Singapore Maths
English National Curriculum 2014

This book is made using
responsibly sourced paper

Workbook
4A

Maths —
No Problem!

Singapore Maths
English National Curriculum 2014

This book is made using
responsibly sourced paper

Singapore Education

Singapore hasn't always had great Maths performance.

It was ranked 16th out of the 26 countries participating in the 1983 SIS study.

The government recognised this was not good enough for an economy entirely dependent on its human resources, so they started examining leading teaching concepts in the early 1980s.

TIMSS Benchmark 2011

Legend:
- Singapore
- International Average
- England

Advanced Learners:
- Singapore: 43
- International Average: 4
- England: 18

High Learners:
- Singapore: 78
- International Average: 28
- England: 49

Intermediate Learners:
- Singapore: 94
- International Average: 69
- England: 79

Data for 10 Year Olds (Year 5)

Since 1995 Singapore has been at the top of mathematics education.

Trends in International Mathematics and Science Study

TIMSS Benchmark 2011

Data for 14 Year Olds (Year 9)

Legend: Singapore | International Average | England

	Advanced Learners	High Learners	Intermediate Learners
Singapore	48	78	92
International Average	3	17	46
England	8	35	69
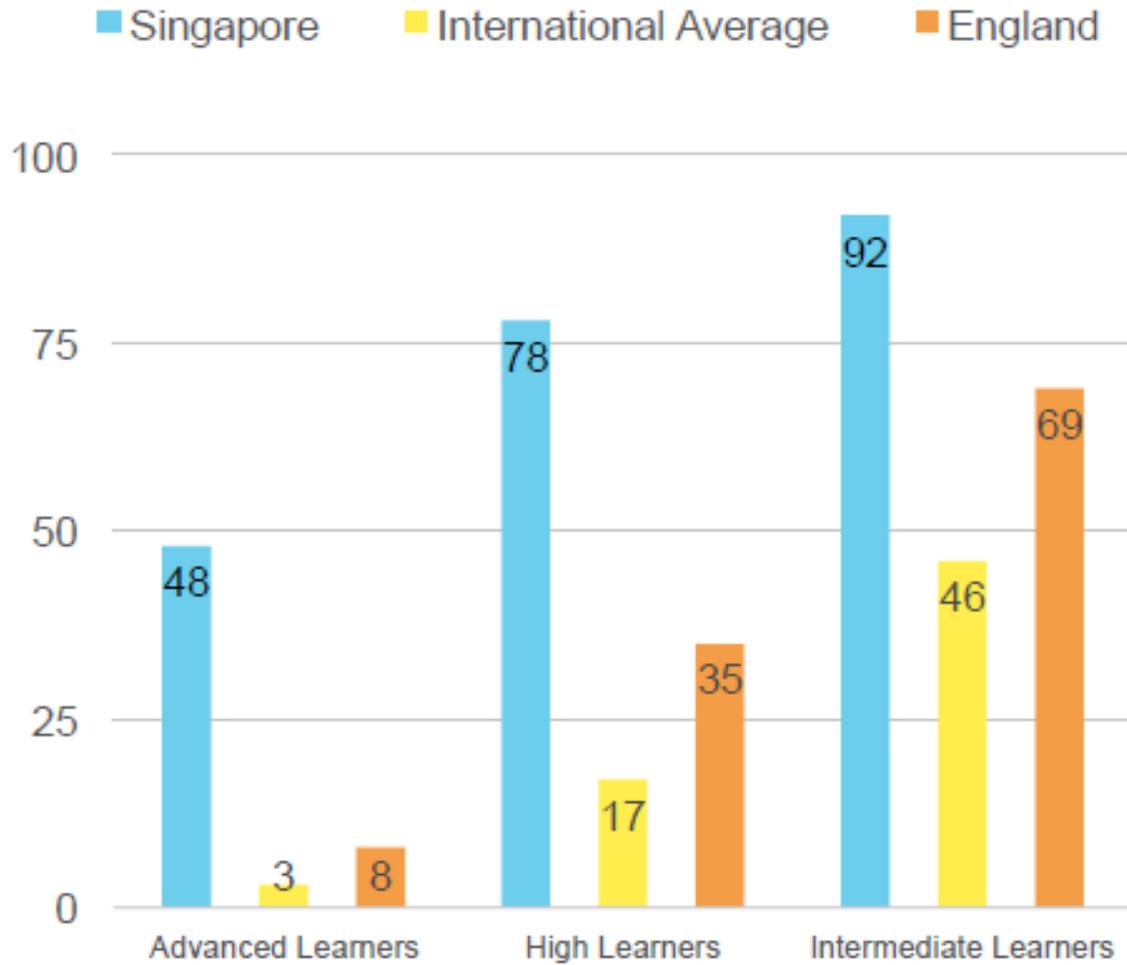
Developing positive attitudes to mathematics is an important goal of the school maths curriculum.

In Singapore this contributes towards the primary goal of mathematical problem solving.

Types of Understanding

- Instrumental Understanding
- Relational Understanding

Mastering Concepts

Concepts will be fully developed before moving on. Pupils will have had **plenty of practice** to embed ideas.

Struggling learners are not left behind as there **ample time** to remediate when necessary, advanced learners have enough opportunities to deepen their understanding.

Year 4 Curriculum Content

- Number and Place Value
- Number –   Addition and Subtraction
- Number –   Multiplication and Division
- Number –   Fractions (including decimals)
- Measurement
- Geometry – Properties of Shape
- Geometry – Position and Direction
- Statistics

How lessons are taught

Concepts merge from one chapter to the next. Chapters are broken down into chunks called lessons.

Lessons typically are broken into three parts and can last one or more days.

Pupils master topics before moving on.
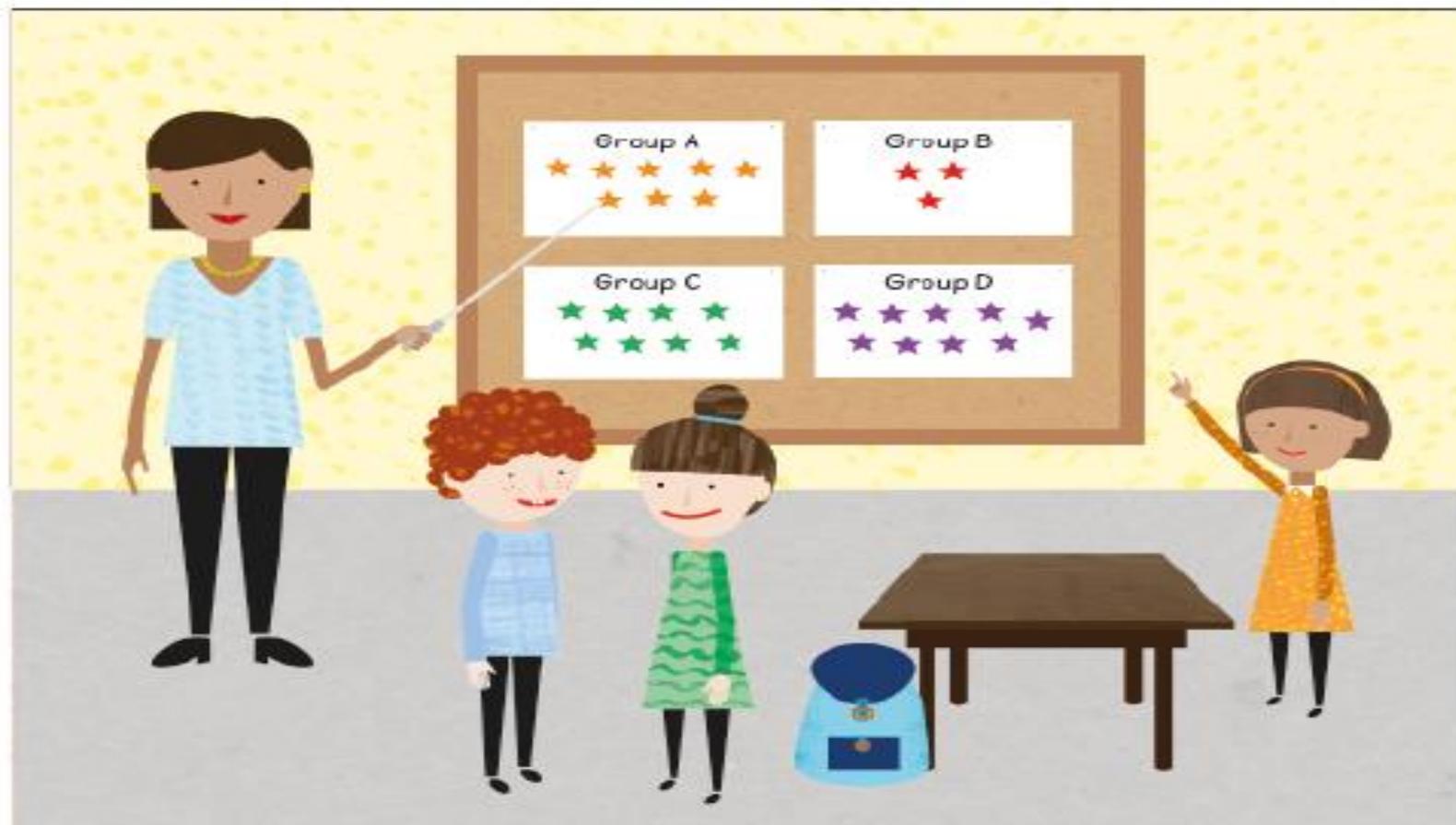
The three parts to a lesson are:

1 *Anchor task — the entire class spends a long time on one question guided by the teacher*

2 *Guided practice — practice new ideas in groups guided by the teacher*

3 *Independent practice — practice on your own*

Concrete

Pictorial

Abstract

CPA approach

80m

48m   ?

(c)   3   2   3   7
+   4   5   2   8
_____

_____

Pictorial representation

When a child has sufficiently understood the hands-on experiences performed and can now relate them to representations, such as a diagram or picture of the problem.
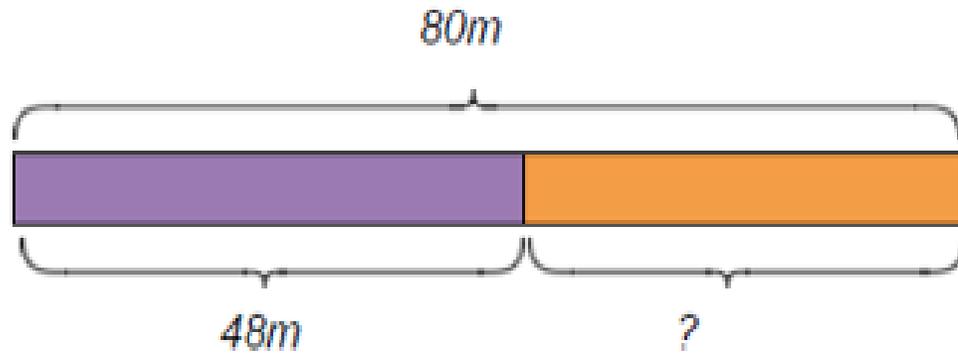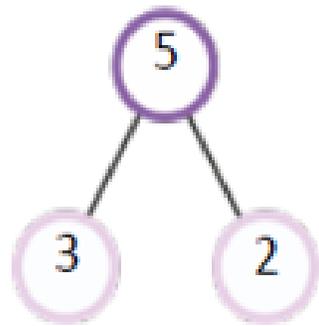
Bar Model

Transition to the bar model

1 Use 🔴 🔵 to show the number of pencils.

Number of red pencils → 5   3 ← Number of blue pencils

? ← Total number of pencils
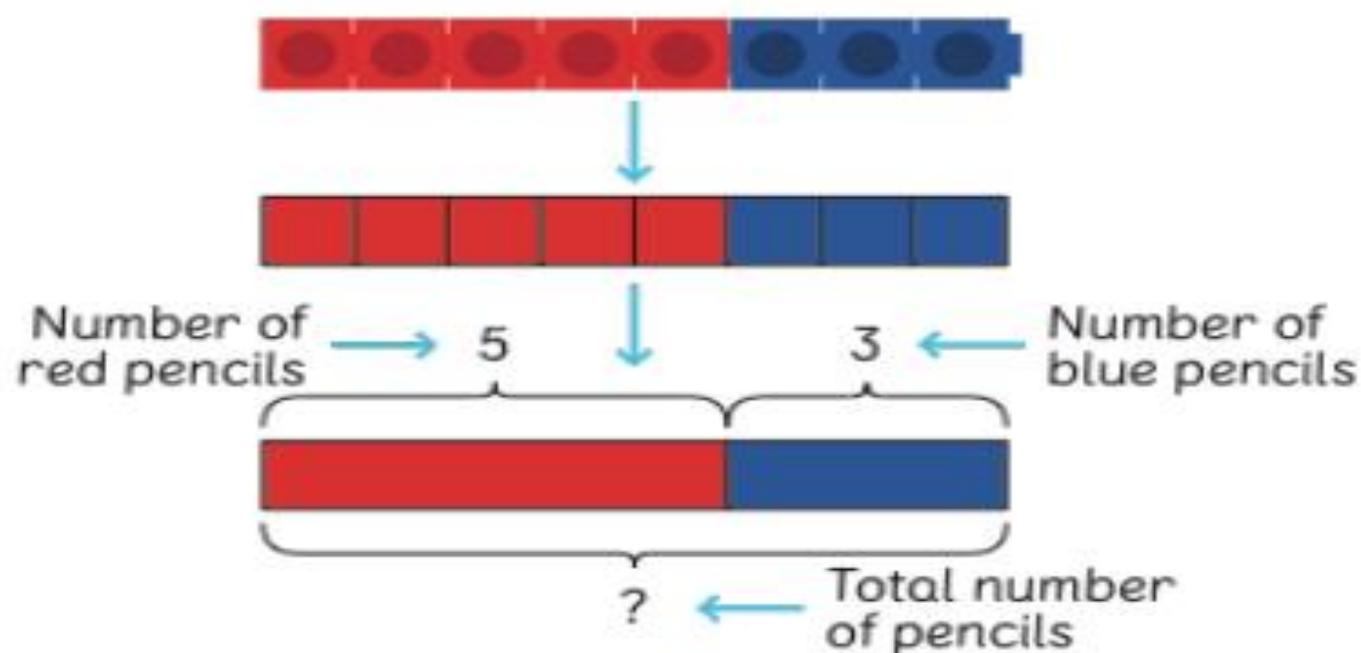
$5 + 3 = 8$ or $3 + 5 = 8$

There are 8 pencils altogether.

Draw bars to show each number.

Bar Model

Transition to the bar model

2 has 15 pencils.

There is not enough space to use ◖●◗◖●◗!

has 23 pencils.

How many pencils do they have altogether?

| | 15 | 23 |

?
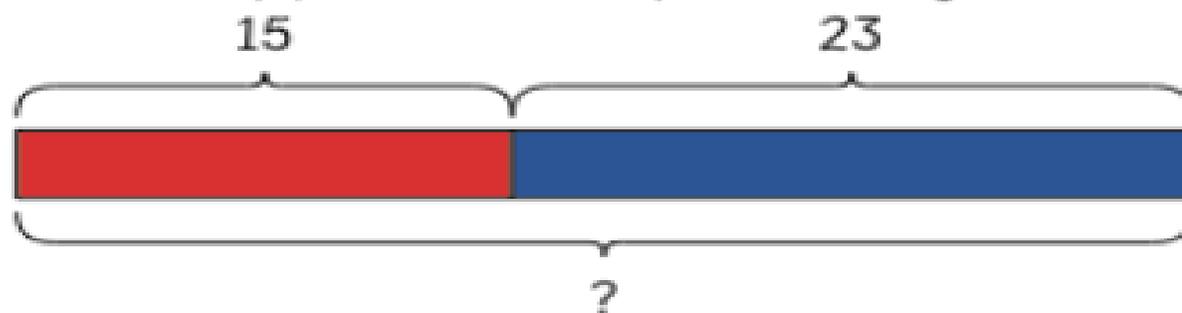
15 + 23 = 38

They have 38 pencils altogether.

	T	O
	1	5
+	2	3
	3	8

Bar Model

Solving word problems — mass

The mass of a pear is 135 g.
A watermelon is 375 g heavier than the pear.
What is the mass of the watermelon?

135g

Pear

375g

Watermelon

? g

135g + 375g = 510g

Donna deposited £75 into her bank account. Her account was then £1245. How much did she have before she made the deposit?

£1245	
£75	?

£1245 – £75 = £1170

Abstract representation

Abstract refers to symbolic representations such as numbers or letters that the child writes or interprets to demonstrate understanding of a task.

```
(c)        3   2   3   7

    +      4   5   2   8
    _____



    _____
```

Addition

+
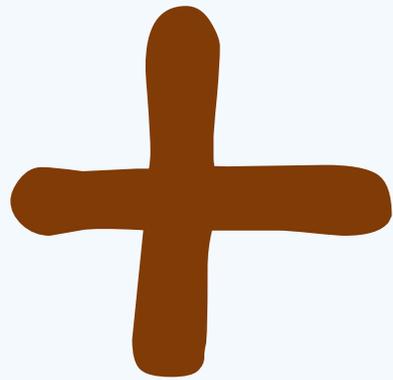
Anchor Task Example

5608 + 1235 = 6843

In Focus

5608 tickets for a charity concert were sold before the day of the concert.
On the day of the concert, another 1235 tickets were sold.

5608   1235

?
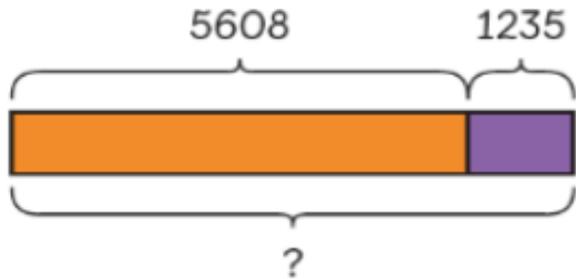
How can we find the total number of concert tickets sold?

Let's estimate.

```
    5   6   0   0
+   1   2   0   0
_____
    6   8   0   0
```

1 Find the sum of 5608 and 1235.

Step 1   Add the ones. 8 ones + 5 ones = 13 ones

Rename the ones. 13 ones = 1 ten and 3 ones

1000 1000 1000 1000 1000	100 100 100 100 100 100	10	1 1 1 1 1 1 1 1 1 1
1000	100 100	10 10 10	1 1 1

$$
\begin{array}{r}
5\ 6\ 0\ 8 \\
+\ 1\ 2\ 3\ 5 \\
\hline
3 \\
\hline
1
\end{array}
$$

(c)
```
    3  2  3  7
+   4  5  2  8
_____

_____
```
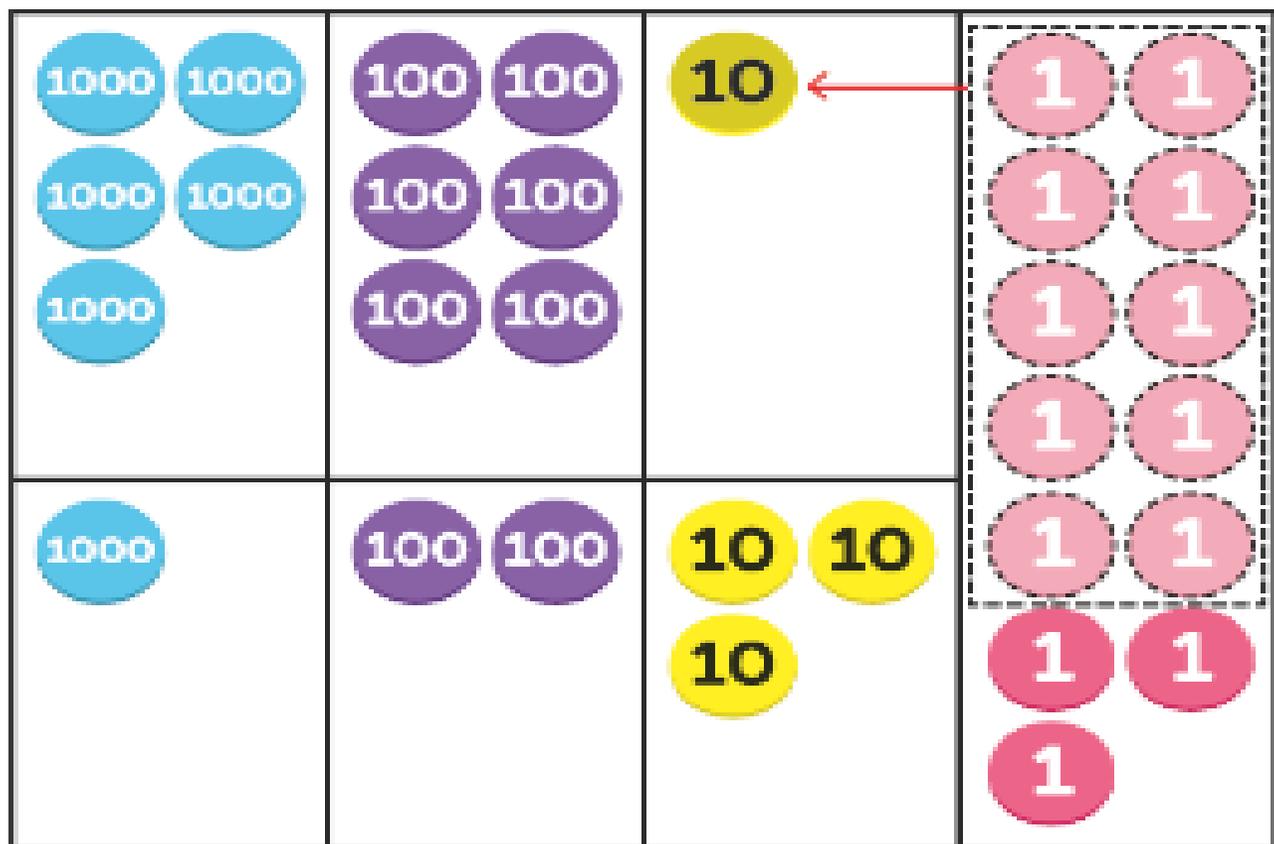
(b) $2453 + 2539 =$ [ ]

| 2453 | 2539 |

sum

3 Circle the two numbers that give the sum.

(a)

3506 6205 1429 4137	Sum
	7634

Independent Work and Journal Example

Exit Slip Chapter 2 Lesson 4

Bloom's Bunch – Eva the Evaluator

Convince me which digit should go in the box.

$$2498$$
$$+ \ 22\Box1$$
$$\overline{4719}$$

Subtraction

—

I have £5280 with me.

After Ruby spent £3169, how much was left?

I have £5280 with me.

After Ruby spent £3169, how much was left?

Let's Learn

£5280

spent | remaining
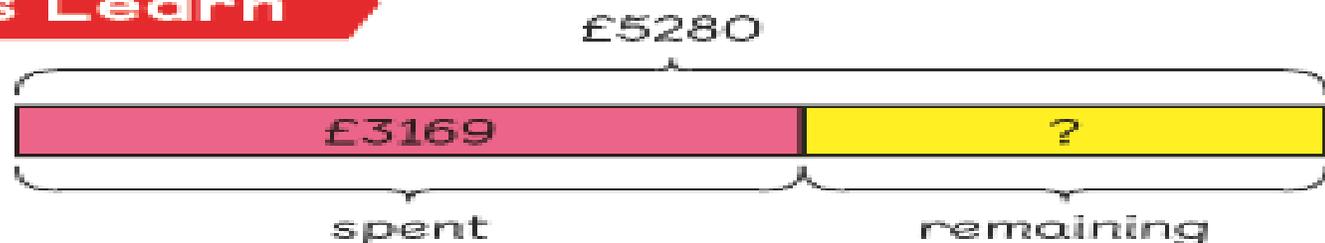
$5280 - 3169 =$ 2111

5280
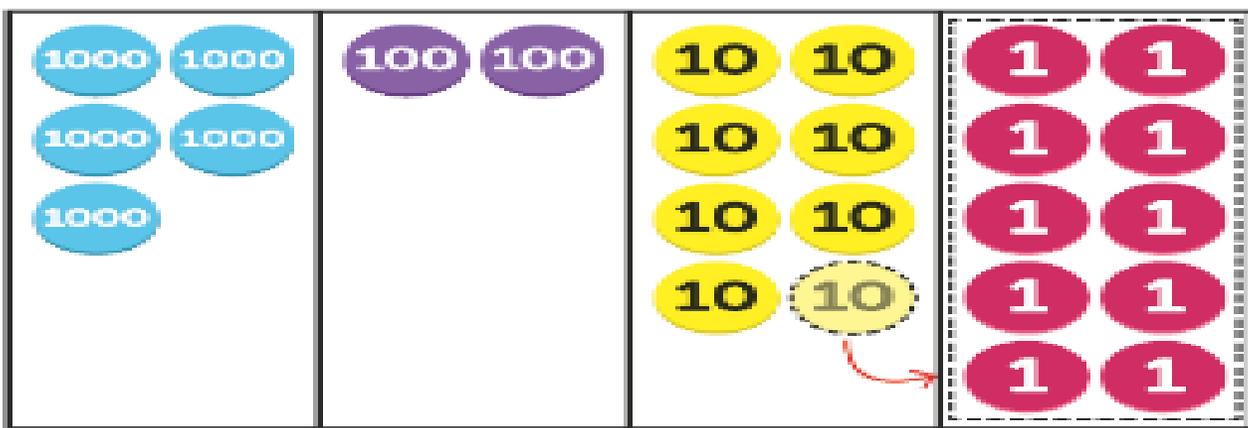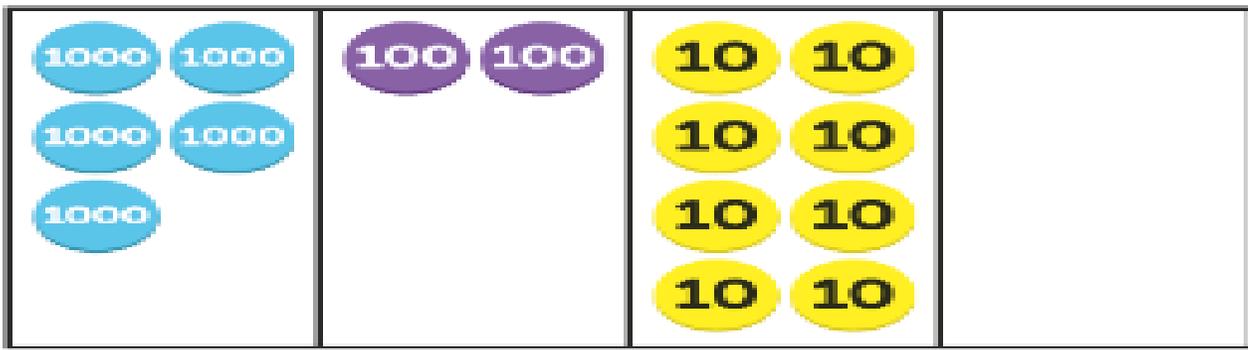
There aren't enough ones.

$$\begin{array}{r} 5\ 2\ \overset{7}{\cancel{8}}\ \overset{10}{\cancel{0}} \\ -\ 3\ 1\ 6\ 9 \\ \hline \\ \hline \end{array}$$

1 Subtract.

(a)   5723 − 79 = $\boxed{5644}$

$$
\begin{array}{r}
5 \;\; \overset{6}{\cancel{7}} \;\; \overset{11}{\cancel{2}} \;\; \overset{13}{\cancel{3}} \\
-\quad\quad\;\; 7 \;\; 9 \\
\hline
5 \;\; 6 \;\; 4 \;\; 4 \\
\hline
\end{array}
$$

5723

5 thousands

6 hundreds   11 tens

13 ones

Bloom's Bunch – Eva the Evaluator

Prove the following calculation is incorrect.

$$
\begin{array}{r}
7890 \\
-\ \underline{3259} \\
\underline{4639}
\end{array}
$$

$$
\begin{array}{r}
{}^{?}8\ {}^{1}0 \\
{}^{7}8\ \cancel{9}\ 0 \\
-\ \underline{3\ 2\ 5\ 9} \\
4\ 6\ 3\ 1
\end{array}
$$

because you can't do 0 – 9 so you rename the 9 to 8 and 0 to 10 then you can do it. So it is incorrect. The actual answer is 4631

1 There are 283 boys and 327 girls in the hall.
195 children leave the hall.
How many pupils are left in the hall?

283 | 327

?

| 283 | + | 327 | = | 610 |

610

195 | ?
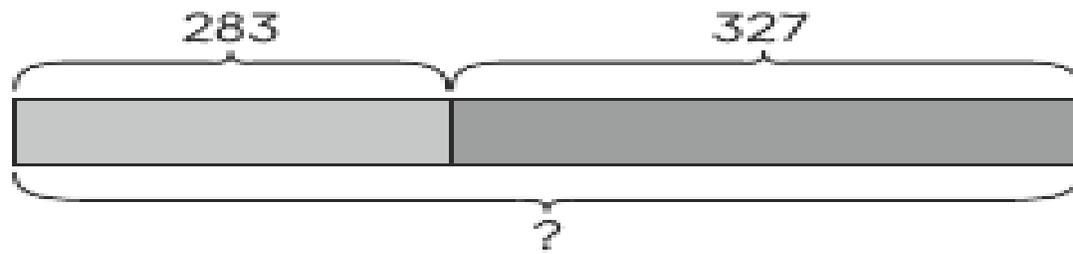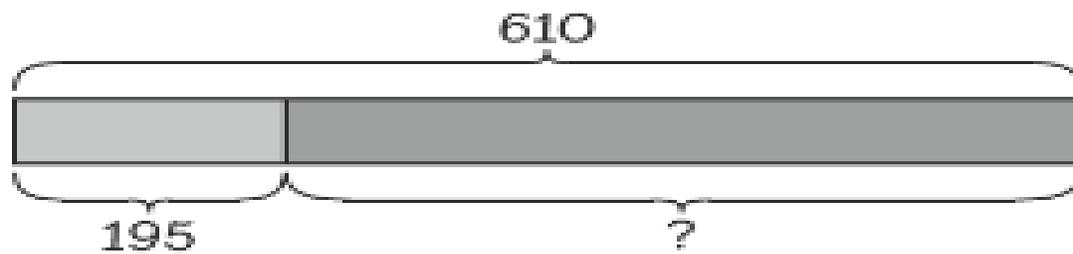
| 610 | – | 195 | = | 415 |

There are | 415 | pupils left in the hall.

Multiplication

X
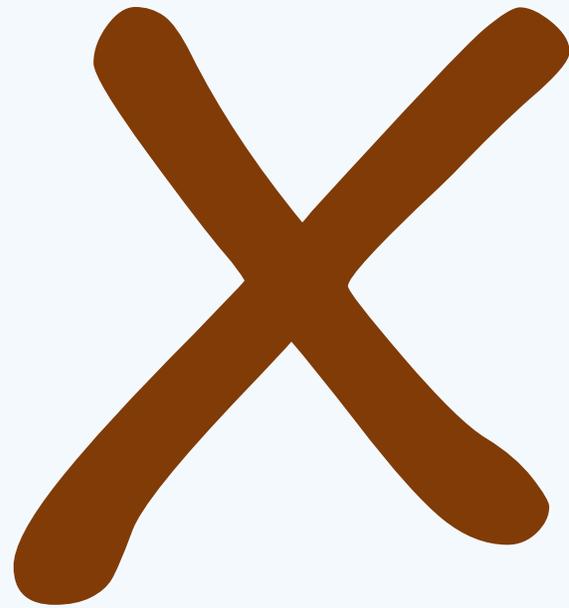
Multiplying by 9

1 Multiply by counting in nines.

(a) 5 × 9 = ☐

(b) 3 × 9 = ☐

(c) 2 × 9 = ☐

(d) 4 × 9 = ☐

(e) 7 × 9 = ☐

(f) 6 × 9 = ☐

(g) 10 × 9 = ☐

(h) 9 × 9 = ☐

2 Fill in the blanks.

$3 × 9 = 27$

$4 × 9 = 27 +$ **9** $=$ **36**

$5 × 9 =$ **36** $+$ **9** $=$ **45**
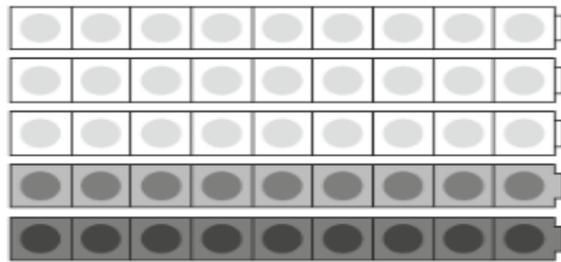
3 Complete the number patterns.

(a) 9, 18, 27, ☐ , ☐ , 54

(b) 27, ☐ , 45, ☐ , 63

(c) ☐ , ☐ , 45, 54, 63

(d) 45, 54, 63, ☐ , ☐ , 90

(e) ☐ , 18, 27, 36, 45, ☐

4 Match.

7 × 9	27
3 × 9	63
4 × 9	81
2 × 9	36
5 × 9	18
9 × 9	72
6 × 9	54
8 × 9	45

Exit Slip – Chapter 3 Lesson 1
Bloom's Bunch – Amar the Analyser and Connor the Creator

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

Level 1 – Highlight the multiples of 6.

Level 2 – Complete level 1 and explain any patterns.

Level 3 – Complete level 1 and 2. Create a number sequence with missing numbers linked to multiples of 6.

Level 4 – Complete 1, 2 and 3. Then answer the following

True or false?
$7 \times 6 = 7 \times 3 \times 2$
$7 \times 6 = 7 \times 3 + 3$
Explain your reasoning.

2) On a number grid it goes down diagonally. Also theres a row that the end numbers end in 0 and a row of 8, a row of 6, a row of 4 and a row of 2. only on a number grid?

3) What goes in the missing numbers.
6, 12, ___, 24, 30, ___, ___, 48

4) The first one is true because.
$7 \times 6 = 42$
$7 \times 3 = 21$
$21 \times 2 = 42$
Second one false because
$7 \times 3 = 21$
$21 + 3 = 24$

... and then will be you ... ... you other hand and what ever you have the answer.

Exit Slip – Chapter 3 Lesson 3
Bloom's Bunch – Ruby the Rememberer

Three children calculated 9×6 in different ways.

Identify each strategy and complete the calculations.

Jenson
$9 \times 6 = 9 \times 5 + \boxed{9}$
$= \boxed{54}$

Lydia
$9 \times 6 = 9 \times 7 - \boxed{9}$
$= \boxed{54}$

Andrew used the commutative law
$9 \times 6 = \boxed{6} \times \boxed{9}$

Extra challenge – now find the answer to 9×12 in three different ways.

$9 \times 12 = 9 \times 11 + 9 = 108$
$9 \times 12 = 9 \times 13 - 9 = 108$
$9 \times 12 = 12 \times 9$

# In Focus

Each ticket from London to Middlesbrough costs £116.

Adult	Ticket	Adult	Price
STD	Single	One	£116.00

From
LONDON

To
MIDDLESBOROUGH

How can we find the cost of 6 tickets from London to Middlesbrough?
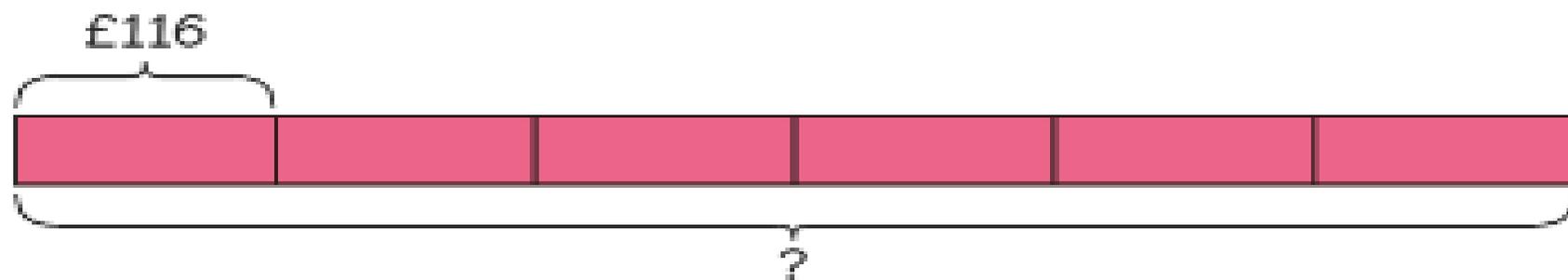
£116

1 £116 × 6 = ▢

?

100 × 6 = 600
10 × 6 = 60
6 × 6 = 36
_____
116 × 6 = 696

100 × 6   10 × 6   6 × 6

The tickets cost £696.

2 $116 \times 6 = \boxed{}$
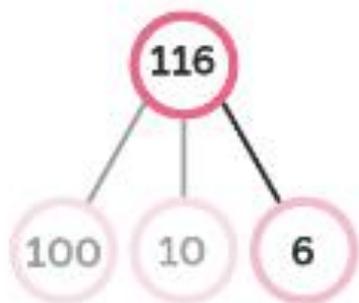
116
100 10 **6**

$$\begin{array}{ccc} 1 & \overset{3}{1} & 6 \\ \times & & 6 \\ \hline & & 6 \end{array}$$

36
3 tens   6

116
100 **10** 6
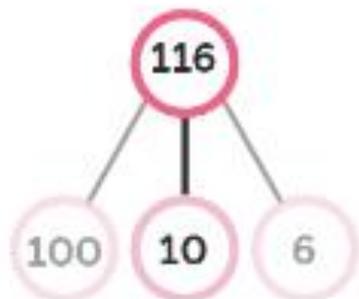
1 ten × 6 = 6 tens
6 tens + 3 tens = 9 tens

$$\begin{array}{ccc} 1 & \overset{3}{1} & 6 \\ \times & & 6 \\ \hline & 9 & 6 \end{array}$$

116
100 10 6

$$\begin{array}{ccc} 1 & \overset{3}{1} & 6 \\ \times & & 6 \\ \hline 6 & 9 & 6 \end{array}$$
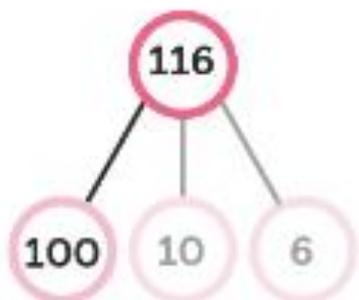
1 hundred × 6
= 6 hundreds

(a)

```
        3   1   6
  ×             6
  ─────────────────
            3   6
            6   0
  + 1   8   0   0
  ─────────────────
    1   8   9   6
  ─────────────────
```

316 × 6 = 1896

(g) 2 × 435 = 870

(h) 3 × 629 = 1887

(i) 719 × 5 = 3595

(j) 524 × 4 = 2096

Division
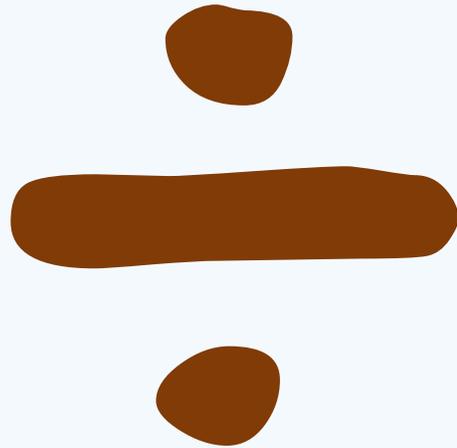
Dividing by 9

1 Circle the items to make groups of 9 and write down the division equations.

(a)

$$\boxed{} \div \boxed{} = \boxed{}$$

There are $\boxed{}$ equal groups.

3 Write the missing numbers.

(a) $\boxed{} \times 9 = 36$

$36 \div 9 = \boxed{}$

Put these cupcakes equally into 7 boxes.
How many cupcakes are there in each box?

1
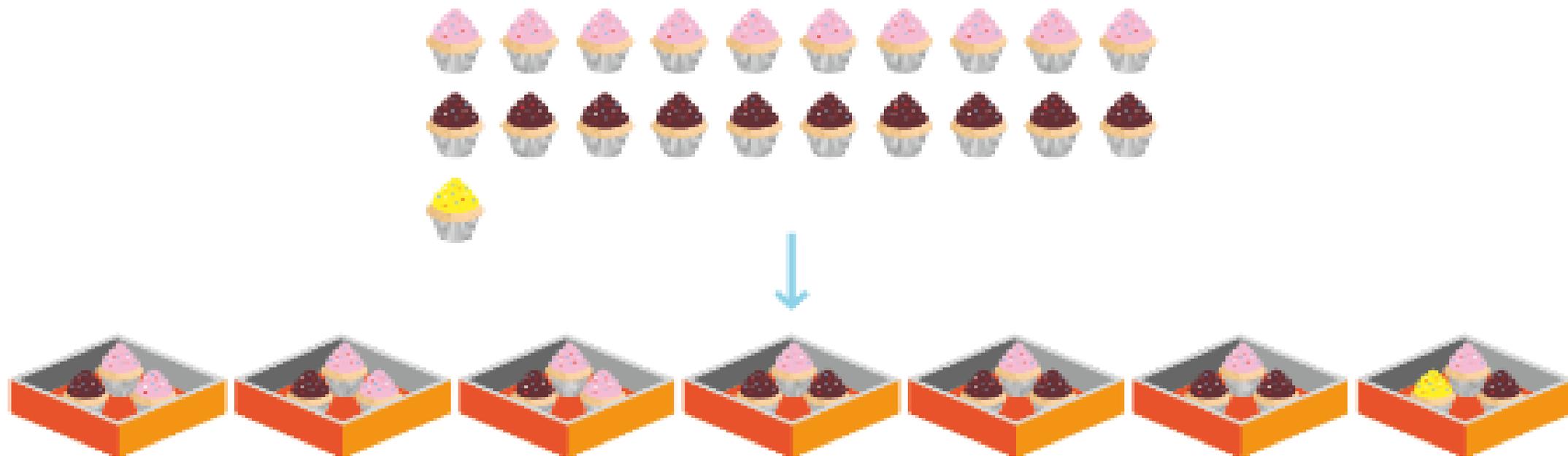
Divide 21 by 7 to find the number of cupcakes in each box.

$21 \div 7 = 3$

$21 \div 7 = 3$
$7 \times 3 = 21$

There are 3 cupcakes in each box.

£1 £1 £1 £1 £1 £1

Try to share 6 coins among 3 friends.

Dividing 3-Digit Numbers

1 Circle the discs to show the division facts.
Fill in the blanks.

(a) $246 \div 2$

$=$ ▢
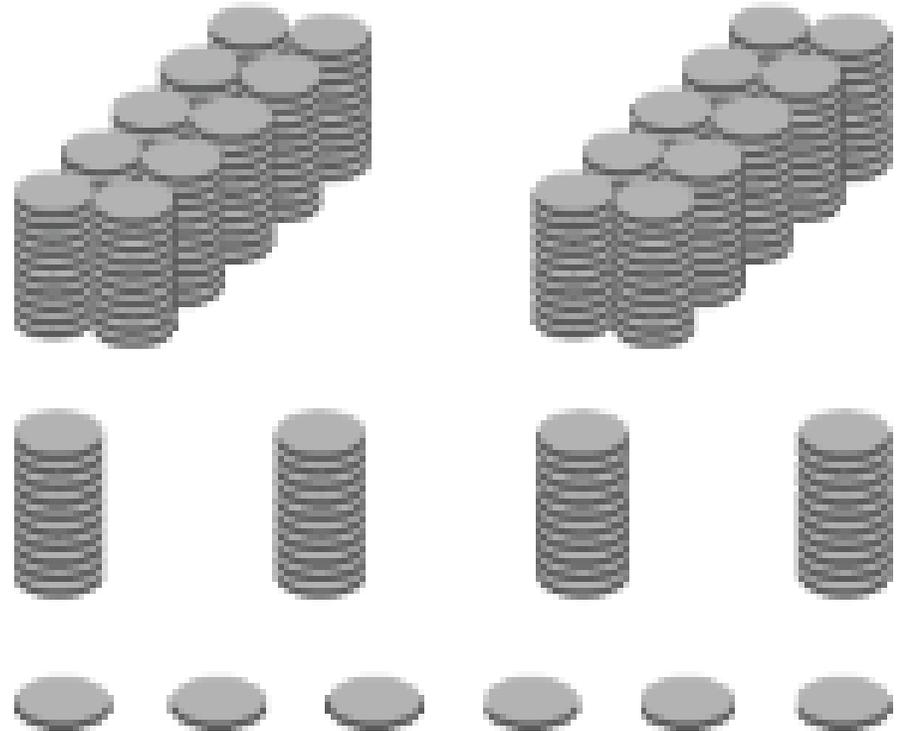
2 Divide to find:

(a) $888 \div 8 = \boxed{111}$

$800 \div 8 = \boxed{100}$

$80 \div 8 = \boxed{10}$

$8 \div 8 = \boxed{1}$

$\boxed{100} + \boxed{10} + \boxed{1} = \boxed{111}$

(b) $696 \div 3 = \boxed{232}$

$600 \div 3 = \boxed{200}$

$90 \div 3 = \boxed{30}$

$6 \div 3 = \boxed{2}$

$\boxed{200} + \boxed{30} + \boxed{2} = \boxed{232}$

3 Divide.

(a) $248 \div 2 =$ **124**

(b) $806 \div 2 =$ **403**

(c) $369 \div 3 =$ **123**

(d) $555 \div 5 =$ **111**

bought a gift for a friend.

They shared the cost of the gift equally.

£321

£50 £50 £50 £50

£50 £50 £10 £10

£1

Find the amount each person paid.

$321 \div 3 = $ ▢
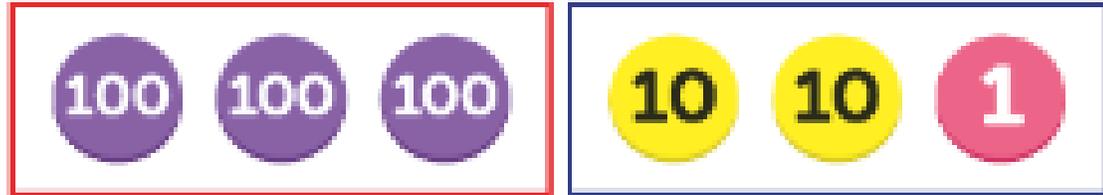
Take 300 from 321. 21 is left.
Take 21 from 21. That's all!

Method 1
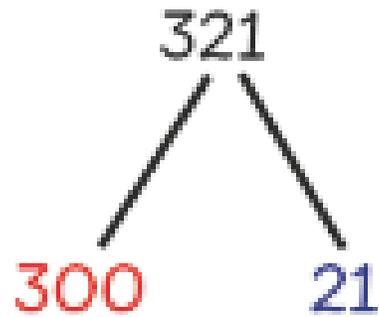
Divide 300. Divide 21.
The result is a quotient.

```
      321
     /    \
  300      21
```

```
      321
     /    \
  300      21
  ↓        ↓
  100      7
```

Method 2

3 hundreds ÷ 3

21 ones ÷ 3

$$321 \div 3 = 107$$

Each person paid £107.

Struggling learners

In each lesson we think about the children who find it more difficult to learn in Maths.

We give them many opportunities to work with resources, (e.g. counters, dienes, place value counters etc.), time to talk and discuss and guided adult support.

Children need time and space to accommodate learning.
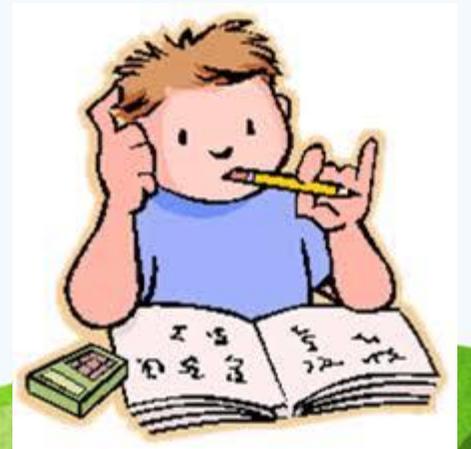
Deeper learning (advanced)

In each lesson we challenge children who learn more quickly and may already know the learning. We deepen the learning through challenging the children to explain, orally and pictorially, finding various different possibilities, justifying and giving reasons.

This develops their **meta cognition**; an ability to articulate their learning and reflect on mathematical concepts. We are developing an approach which illustrates it is less useful to have a large amount of content but more useful to deepen thinking.

Historically, we have accelerated learning by moving children on to larger numbers and given new content. The new curriculum is an enrichment model to develop meta cognition.

Place one of these symbols in the circle to make the number sentence correct: >, < or =.

Explain your reasoning.

8×50 (=) 50×8

8×50 (=) 80×5

300×3 (<) 5×200

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

Sally

| 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 |

Sam

| 15 |

150 ÷ 10 = 15
Each bar represents 15
Sally 9 x 15 = 135
Sam 1 x 15 = 15
Sally has 120 more cards that Sam (135 –15)

Number sense

$$51 \div 3 = ?$$

30   21

$$30 \div 3 = 10$$
$$21 \div 3 = 7$$

51 − 17 = ?

40   11   10   7

40 − 10 = 30
11 − 7 = 4

$$51 \times 3 =$$

$$50 \qquad 1$$

$$50 \times 3 = 150$$

$$1 \times 3 = 3$$

Impact

- Both classes are receiving a practical and well-pitched curriculum;

- Teachers' planning in Maths has been reduced to allow them to spend more time preparing directly for the lessons;

- Practice is consistent across the year group;

- Schools who have implemented the scheme previously have seen results and the quality of Mathematics improve greatly.

Further Information and Help at Home

- A series of Parents videos are available on our website which explain the way in which we will use the scheme to teach key concepts.

- Let's look at an example now…

http://www.mathsnoproblem.co.uk/parent-videos

Thank you for your time.

Feel free to have a look through the books and resources at the back and talk to us.