

Year 5 Textbook 5B



Pearson

Series Editor: Tony Staneff



Year 5 Textbook 5B



Dexter

Dexter is determined.

When he makes a mistake, he learns from it and tries again.

flexible



Flo

helpful



Sparks

curious



Ash

brave



Astrid



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Your teacher will tell you which page you need.



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Let's get started!



How to use this book

These pages make sure we're ready for the unit ahead. Find out what we'll be learning and brush up on your skills!



Unit 7
Multiplication and division 2

In this unit we will ...

- ✦ Multiply a number up to 4 digits by a 1-digit or 2-digit number
- ✦ Divide a number up to 4 digits by a 1-digit number
- ✦ Interpret remainders
- ✦ Solve problems involving multiplication, division and remainders

How can you use the grid method to work out 17×4 ?

| | | |
|---|---|---|
| | T | O |
| | 4 | 0 |
| + | 2 | 8 |
| | 6 | 8 |
| | | |

We will need some maths words. Do you know what they all mean?

multiply divide add subtract
place value partition equal
multiple remainder sum total

We also need to be able to use the short division method.

| | | |
|---|---|---|
| | 4 | 3 |
| 2 | 8 | 6 |
| | | |

| | | |
|--|---|---|
| | T | O |
| | 4 | 0 |
| | 2 | 8 |
| | 6 | 8 |

Discover

Lessons start with **Discover**.

Here, we explore new maths problems.

Can you work out how to find the answer?

Don't be afraid to make mistakes.
Learn from them and try again!

Unit 7: Multiplication and division (2), Lesson 2

Multiply 2-digit numbers (area model)

Discover

New supermarket floor plan

| | | |
|------|----------------------|--------|
| 10 m | Main food aisle | Bakery |
| 3 m | Fruit and vegetables | Cafe |
| | 20 m | 8 m |

1 a) What will the length of the new supermarket be?
What will the width be?
b) What will the total area of the new supermarket be?

12



Share

Next, we share our ideas with the class.

Did we all solve the problems the same way?
What ideas can you try?

Share

a) $20 + 8 = 28$ m

$10 + 5 = 15$ m

The length of the new supermarket will be 28 m.
The width will be 15 m.

The area model looks like the grid method. I found the area of each part of the supermarket and added them together to get the total area.

To find the total area I needed to work out 28×15 but I was not sure how to do that.

| | | | |
|------|----------------------------------|--------------------------------|--|
| | 20 m | 8 m | |
| 10 m | $20 \times 10 = 200 \text{ m}^2$ | $8 \times 10 = 80 \text{ m}^2$ | |
| 5 m | $20 \times 5 = 100 \text{ m}^2$ | $8 \times 5 = 40 \text{ m}^2$ | |

| H | T | O |
|---|---|---|
| 2 | 0 | 0 |
| 1 | 0 | 0 |
| 8 | 0 | |
| + | 4 | 0 |
| | 4 | 2 |
| | 0 | 0 |

The total area of the new supermarket will be 420 m^2 .
This is the same as 28×15 .

Think together

Then we have a go at some more problems together.
Use what you have just learnt to help you.

We'll try a challenge too!



This tells you which page to go to in your Practice Book.

Think together

1. This is the floor plan for a new toy shop.

| | | | |
|------|--|---|--|
| | 30 m | 7 m | |
| 20 m | Crafts $30 \times 20 = \square \text{ m}^2$ | Bikes $7 \times \square = \square \text{ m}^2$ | |
| 3 m | Toys $\square \times \square = \square \text{ m}^2$ | Board games $\square \times \square = \square \text{ m}^2$ | |

a) Find the area of each section in the new toy shop.
b) What is the total area of the new toy shop?

| H | T | O |
|---|---|---|
| | | |
| + | | |
| | | |

2. Use the area model to work out 52×18 .

| | | |
|----|------------------------------------|------------------------------------|
| | 52 | |
| 18 | $\square \times \square = \square$ | $\square \times \square = \square$ |
| | $\square \times \square = \square$ | $\square \times \square = \square$ |

$52 \times 18 = \square$

3. a) Draw an area model to work out each of these calculations.
 45×37 24×81 38^2

The boxes in your area models do not need to be exactly the same. They do need to be big enough to write in the calculations.

b) Max says that the answer to 34×18 is 594. How do you know that Max is not correct just by looking at the last digits in the multiplication?

At the end of each unit there's an **End of unit check**. This is our chance to show how much we have learnt.

End of unit check

1. What is the missing number in the bar model?

| | | | |
|-------|-------|-------|--------|
| 2,062 | 2,062 | 2,062 | 2,062 |
| 2,062 | 0,000 | 0,300 | 20,620 |

2. What multiplication is shown using the grid method?

| | |
|-----|----|
| 600 | 80 |
| 60 | 8 |

3. 34×22 20×36 68×68 24×32

4. What is the correct first step in the multiplication for 42×27 ?

| | |
|----|----|
| 42 | 27 |
| 84 | 54 |
| 84 | 54 |

5. Which of these shows the correct answer to $3,892 + 77$?

6. Ali divides a 3-digit number by 5 and gets a remainder of 4. What number could Ali have divided?

7. A small car holds 4 people. How many cars would be needed to take 187 people?

8. Elio has a large sack of apples. If he put them into bags of 6 he would have 72 full bags and 3 apples left over. If he puts 5 apples into each bag instead, how many bags will he have if there are only apples left over?

Unit 7

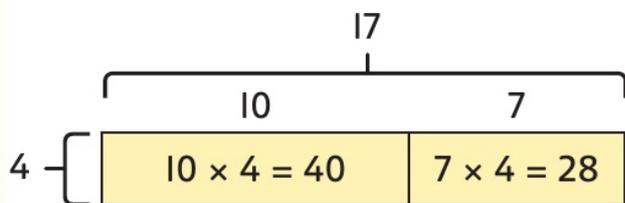
Multiplication and division ②



In this unit we will ...

- ⚡ Multiply a number up to 4 digits by a 1-digit or 2-digit number
- ⚡ Divide a number up to 4 digits by a 1-digit number
- ⚡ Interpret remainders
- ⚡ Solve problems involving multiplication, division and remainders

How can you use the grid method to work out 17×4 ?



| | | |
|---|---|---|
| | T | O |
| | 4 | 0 |
| + | 2 | 8 |
| | 6 | 8 |
| | | |





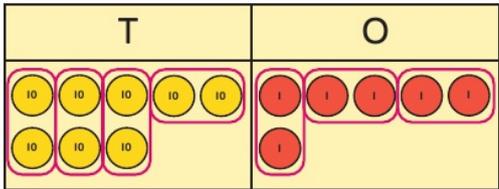
We will need some maths words. Do you know what they all mean?

- multiply
- divide
- add
- subtract
- place value
- partition
- equal
- multiple
- remainder
- sum
- total

We also need to be able to use the short division method.



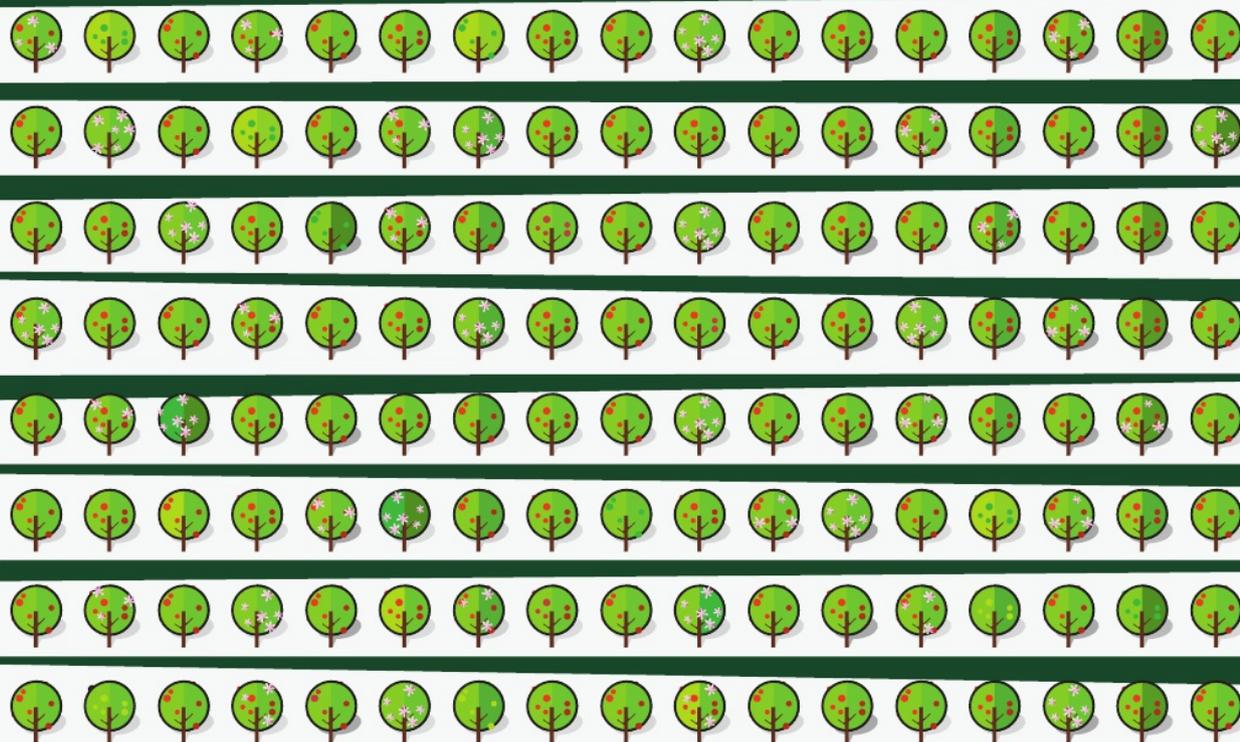
| | | | | |
|--|---|---|---|--|
| | | 4 | 3 | |
| | 2 | 8 | 6 | |
| | | | | |



Multiply a number up to 4-digits by a 1-digit number

Discover

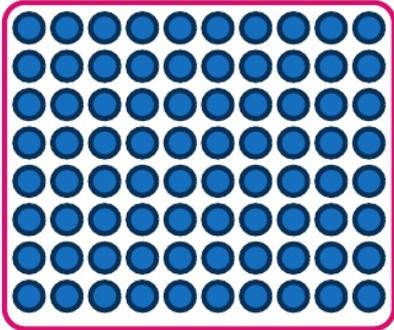
Power Orchard Map



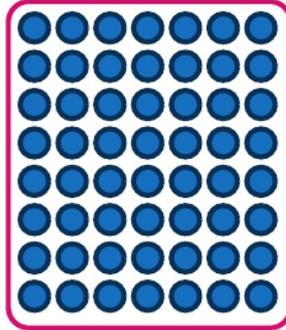
- 1 a) Use an array method to calculate how many trees there are in total.
- b) Use a written method to calculate the number of trees.

Share

- a) There are 8 rows of trees, with 17 trees in each row.



$$8 \times 10 = 80$$



$$8 \times 7 = 56$$

$$80 + 56 = 136$$

- b)

| | H | T | O |
|---|---|---|---|
| | | 1 | 7 |
| x | | | 8 |
| | | | 6 |
| | | 5 | |

| | H | T | O |
|---|---|---|---|
| | | 1 | 7 |
| x | | | 8 |
| | 1 | 3 | 6 |
| | | 5 | |

There are 136 trees in total.

I used counters to represent the trees. I partitioned the counters into sections to make it easier for me to work out the total.



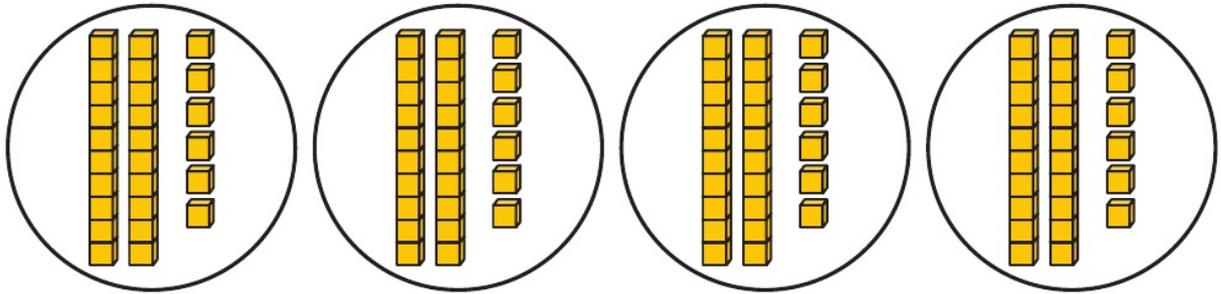
I used the column method that we did last year. This is called formal column multiplication.



Think together

I Use the mathematical equipment to help you work out these multiplications.

a) 26×4



$$20 \times 4 = \square$$

$$6 \times 4 = \square$$

$$\square + \square = \square$$

b) $135 \times 5 = \square$

| H | T | O |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |

$$100 \times 5 = \square$$

$$30 \times 5 = \square$$

$$5 \times 5 = \square$$

2 Complete the multiplications.

a) $42 \times 7 = \square$

| | T | O |
|---|---|---|
| | 4 | 2 |
| x | | 7 |
| | | |
| | | |

b) $142 \times 7 = \square$

| | H | T | O |
|---|---|---|---|
| | 1 | 4 | 2 |
| x | | | 7 |
| | | | |
| | | | |

c) $3,142 \times 7 = \square$

| | Th | H | T | O |
|---|----|---|---|---|
| | 3 | 1 | 4 | 2 |
| x | | | | 7 |
| | | | | |
| | | | | |

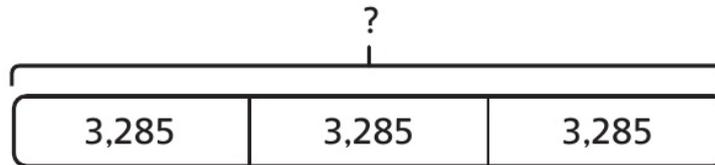
3 Danny and Zac are representing calculations using bar models.

What calculations are being represented? Work out the answers.

a)



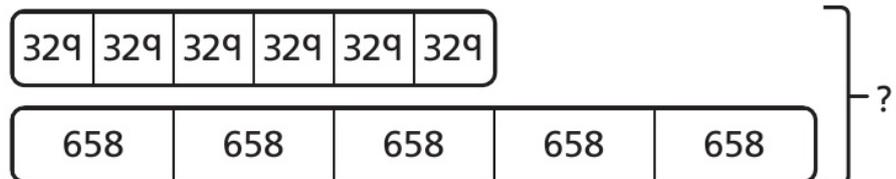
Danny



b)



Zac



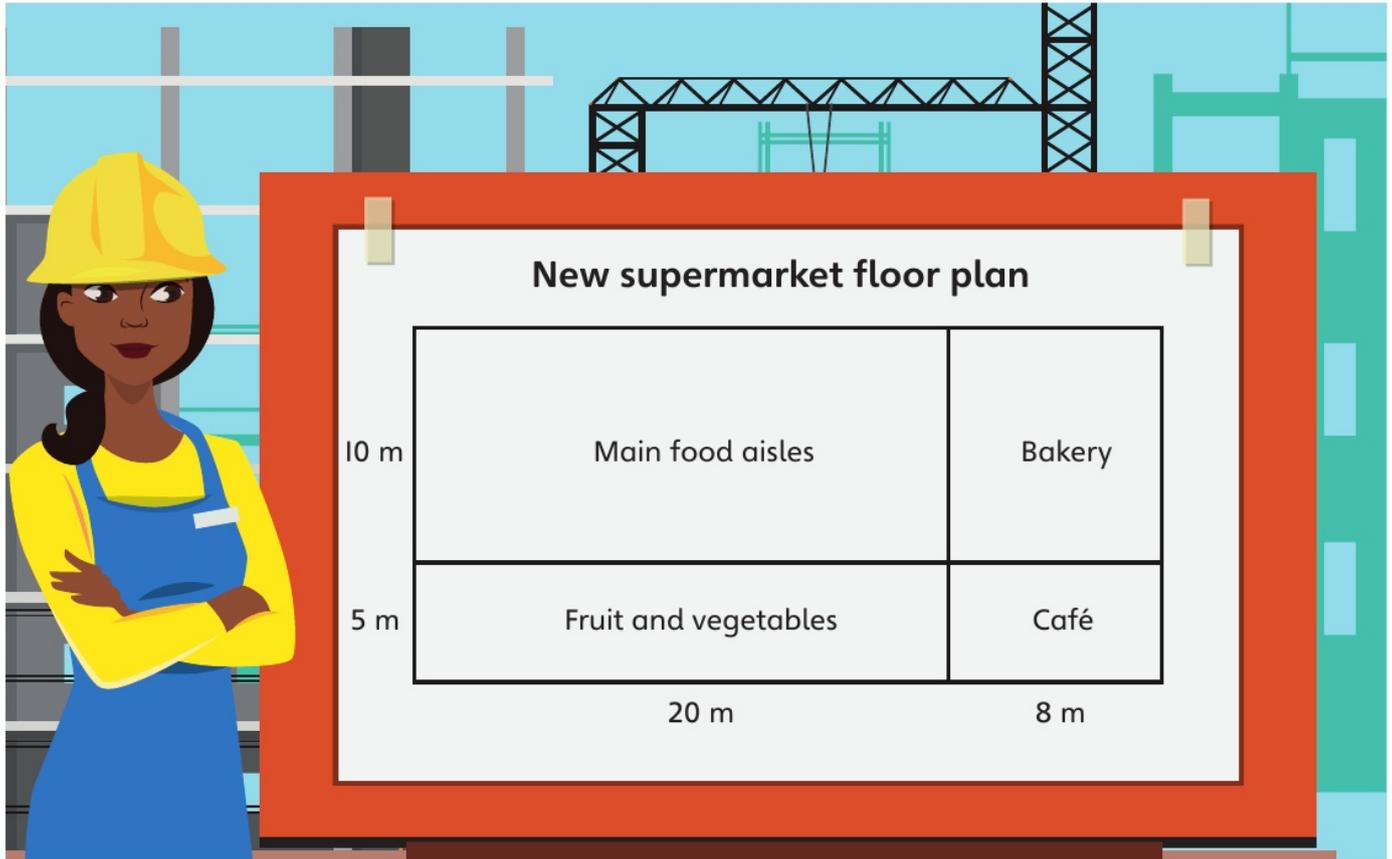
To work out Zac's calculation, I think I need to do two multiplications.

I think I can do it as just one multiplication.



Multiply 2-digit numbers (area model)

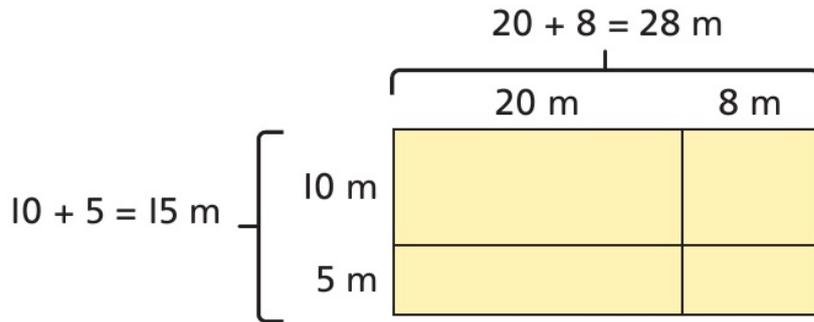
Discover



- I** a) What will the length of the new supermarket be?
What will the width be?
- b) What will the total area of the new supermarket be?

Share

a)



The length of the new supermarket will be 28 m.

The width will be 15 m.

b)

To find the total area I needed to work out 28×15 but I was not sure how to do that.

The area model looks like the grid method. I found the area of each part of the supermarket and added them together to get the total area.

| | 20 m | 8 m |
|------|----------------------------------|--------------------------------|
| 10 m | $20 \times 10 = 200 \text{ m}^2$ | $8 \times 10 = 80 \text{ m}^2$ |
| 5 m | $20 \times 5 = 100 \text{ m}^2$ | $8 \times 5 = 40 \text{ m}^2$ |

| | H | T | O |
|---|---|---|---|
| | 2 | 0 | 0 |
| | 1 | 0 | 0 |
| | | 8 | 0 |
| + | | 4 | 0 |
| | 4 | 2 | 0 |
| | 1 | | |

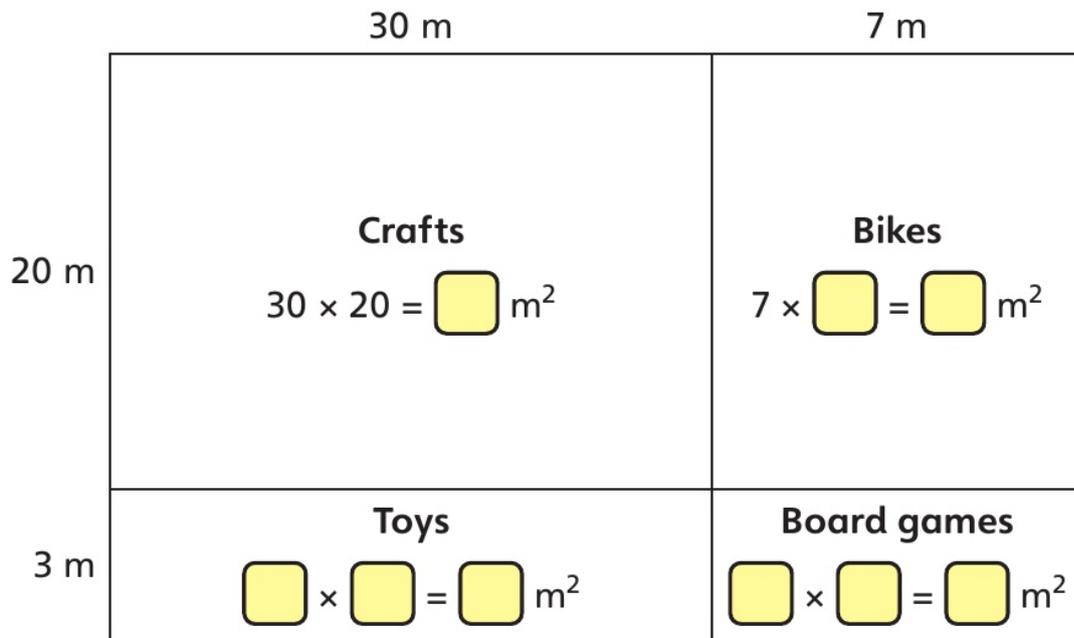
The total area of the new supermarket will be 420 m^2 .

This is the same as 28×15 .



Think together

I This is the floor plan for a new toy shop.



- Find the area of each section in the new toy shop.
- What is the total area of the new toy shop?

| | | | |
|---|---|---|---|
| | H | T | O |
| | | | |
| | | | |
| | | | |
| + | | | |
| | | | |
| | | | |

Multiply 2-digit numbers

Discover



$$34 \times 27$$

Richard

| | | |
|----|----------------------|--------------------|
| | 30 | 4 |
| 20 | $30 \times 20 = 600$ | $4 \times 20 = 80$ |
| 7 | $30 \times 7 = 210$ | $4 \times 7 = 28$ |

| | | | | |
|---|----|---|---|---|
| | Th | H | T | O |
| | | 6 | 0 | 0 |
| | | 2 | 1 | 0 |
| | | 8 | 0 | |
| + | | 2 | 8 | |
| | 1 | 8 | 9 | 0 |
| | | | | |

Lexi

$$34 \times 20 = 680$$

| | | | |
|---|---|--------------|---|
| | | 3 | 4 |
| x | | | 7 |
| | 2 | 3 | 8 |
| | | ² | |

$$680 + 238 = 820$$

Zac

| | | | |
|---|--------------|----------------|---|
| | | 3 | 4 |
| x | | 2 | 7 |
| | 2 | 3 | 8 |
| | 6 | ² 8 | 0 |
| | 9 | 1 | 8 |
| | ¹ | | |

$$34 \times 7$$

$$34 \times 20$$

$$34 \times 27$$



- What mistake has Richard made?
- Look at Lexi's method and Zac's method. What is the same? What is different?

Share

- a) The calculations in the grid are all correct but Richard has lined up the numbers incorrectly in his addition.

| | 30 | 4 |
|----|----------------------|--------------------|
| 20 | $30 \times 20 = 600$ | $4 \times 20 = 80$ |
| 7 | $30 \times 7 = 210$ | $4 \times 7 = 28$ |

The correct answer is 918.

| | Th | H | T | O |
|---|----|---|---|---|
| | | 6 | 0 | 0 |
| | | 2 | 1 | 0 |
| | | | 8 | 0 |
| + | | | 2 | 8 |
| | | 9 | 1 | 8 |
| | | 1 | | |

- b) Lexi partitioned her number and worked out each multiplication separately.

Lexi did that correctly, but she then made a mistake when adding her two totals
 $680 + 238 = 918$.

$$34 \times 20 = 680$$

| | H | T | O |
|---|---|---|---|
| | | 3 | 4 |
| x | | | 7 |
| | 2 | 3 | 8 |
| | | 2 | |

Zac did the same as Lexi, except he did it all in one column multiplication and made no mistakes. This is called long multiplication.

| | H | T | O |
|---|---|----------------|---|
| | | 3 | 4 |
| x | | 2 | 7 |
| | 2 | 3 | 8 |
| | 6 | ² 8 | 0 |
| | 9 | 1 | 8 |

$$34 \times 7$$

$$34 \times 20$$

$$34 \times 27$$

Did you notice that Zac placed a 0 here to show that he is multiplying 34 by 20 and not by 2?



Think together

1 Mr Jones sets the class some more long multiplication questions.

Complete each multiplication.

a) 46×13

| | H | T | O |
|---|---|---|---|
| | | 4 | 6 |
| x | | 1 | 3 |
| | | | |
| | | | |
| | | | |
| | | | |

46×3
 46×10
 46×13

c) 37×21

| | H | T | O |
|---|---|---|---|
| | | 3 | 7 |
| x | | 2 | 1 |
| | | | |
| | | | |
| | | | |
| | | | |

37×1
 37×20
 37×21

b) 34×24

| | H | T | O |
|---|---|---|---|
| | | 3 | 4 |
| x | | 2 | 4 |
| | | | |
| | | | |
| | | | |
| | | | |

34×4
 34×20
 34×24

2 Mr Jones's class are going on a school trip.

There are 29 children in the class and they each pay £15.

How much money is paid in total by all the children?


CHALLENGE

- 3 a) Josh works out 63×24 .

| | Th | H | T | O |
|---|----|---|---|---|
| | | | 6 | 3 |
| x | | | 2 | 4 |
| | 2 | 4 | 1 | 2 |
| | 1 | 2 | 6 | 0 |
| | 3 | 6 | 7 | 2 |
| | | | | |

What mistake has Josh made?

Show the correct long multiplication.

- b) Zac has worked out another multiplication.

What two numbers has Zac multiplied together?

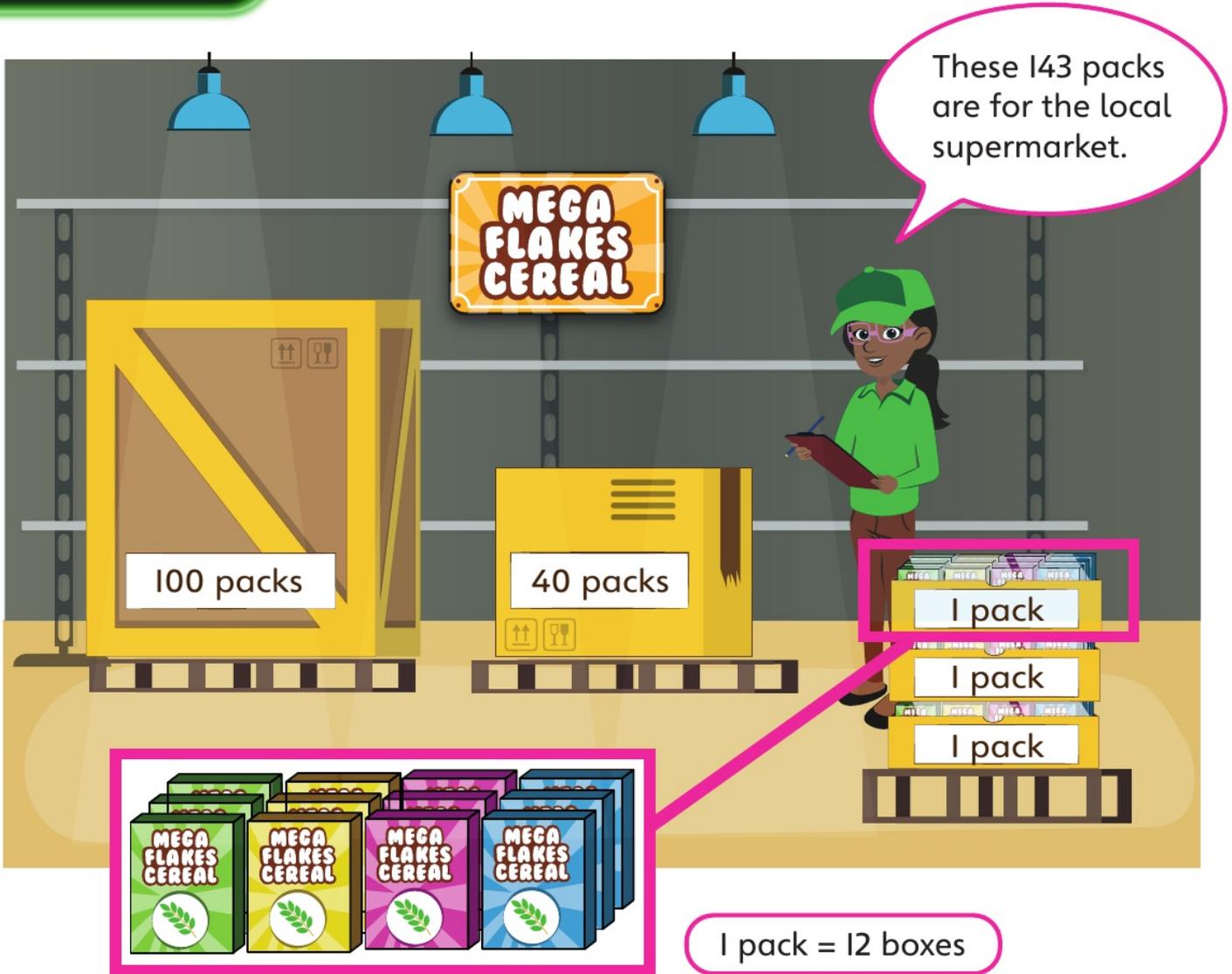
| | H | T | O |
|---|---|---------------|---|
| | | ☀ | ☀ |
| x | | ☀ | ☀ |
| | 3 | 8 | 7 |
| | 4 | $\frac{2}{3}$ | 0 |
| | 8 | 1 | 7 |
| | 1 | | |

I will think about what two numbers multiply together to make 27 first.



Multiply a 3-digit number by a 2-digit number

Discover



- I** a) How many boxes of cereal are there in 143 packs?
Use the grid method to work out the answer.
- b) Check your answer using long multiplication.