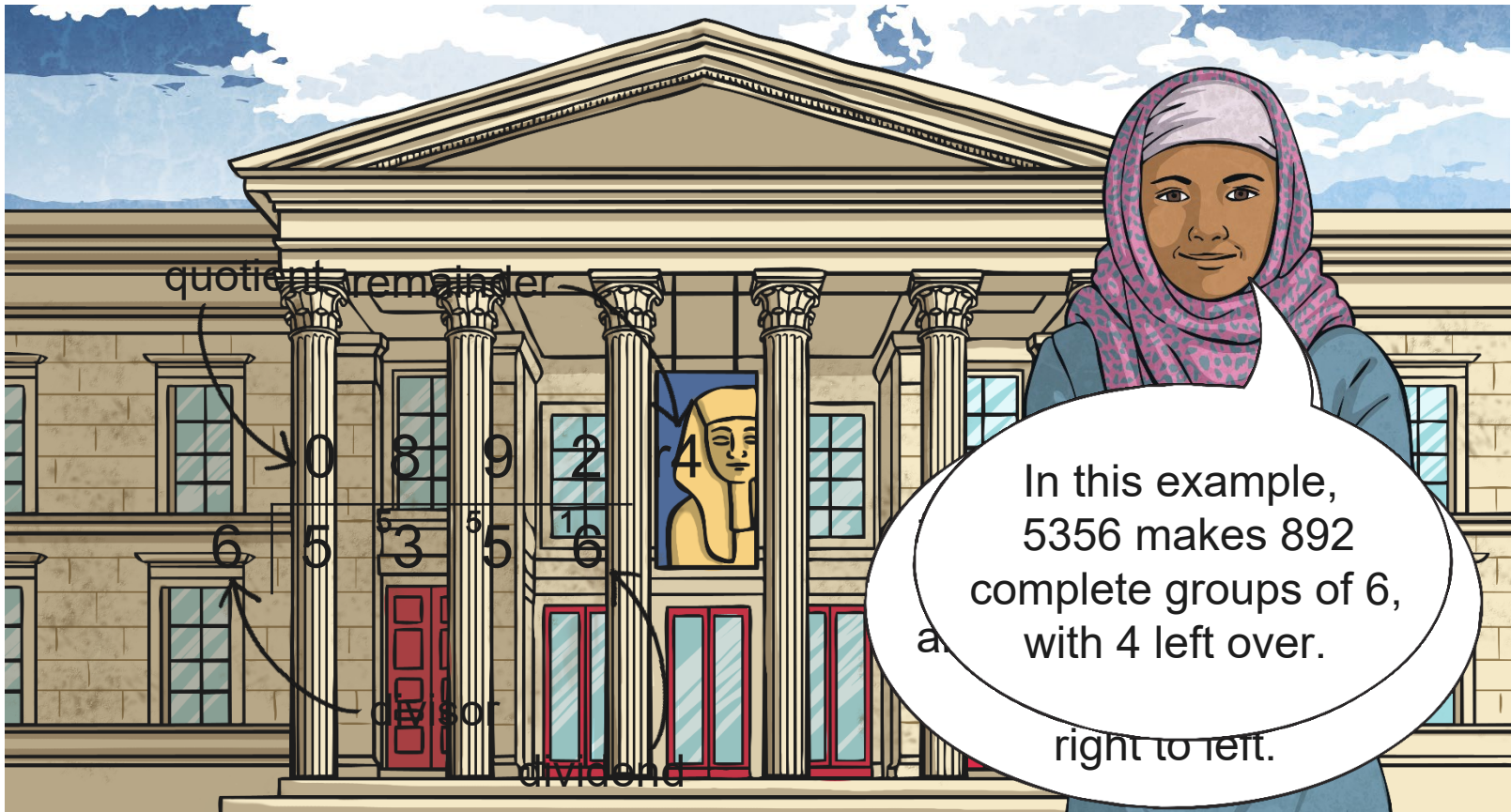


Radiant Reminders



Remainders

We use the short method of division to divide by a one-digit number.



Remainders

We use the short method of division to divide by a one-digit number.

The illustration shows a woman in a pink and blue hijab standing next to a blue clipboard. The clipboard displays a short division problem: $6 \overline{) 5356}$. The numbers are written as 0 8 9 2 r4. Labels with arrows point to the parts of the problem: 'quotient' points to the 0 8 9 2, 'remainder' points to the r4, 'divisor' points to the 6 on the left, and 'dividend' points to the 5 3 5 6. A speech bubble from the woman says: 'When calculating using short division, we start at the left and work towards the right.'

quotient remainder

0 8 9 2 r4

6 $\overline{) 5356}$

divisor dividend

When calculating using short division, we start at the left and work towards the right.

Remainders

We use the short method of division to divide by a one-digit number.

The illustration shows a woman in a pink and blue hijab standing next to a blue clipboard. The clipboard has a white sheet of paper with a division problem written on it. The problem is $6 \overline{) 5356}$. Above the quotient, the words "quotient" and "remainder" are written with arrows pointing to the digits "0892" and "r4" respectively. Below the divisor, the words "divisor" and "dividend" are written with arrows pointing to the "6" and "5356" respectively. The background shows a classical building with columns and a blue sky with clouds.

quotient remainder

0 8 9 2 r4

6 $\overline{) 5356}$

divisor dividend

This is different from the written methods for addition, subtraction and multiplication, where we work from right to left.

Remainders

We use the short method of division to divide by a one-digit number.

The illustration shows a woman wearing a pink and blue patterned hijab and a blue top, standing next to a large clipboard. The clipboard has a silver clip at the top and contains a division problem. The problem is written as follows:

$$\begin{array}{r} 0892 \text{ r}4 \\ 6 \overline{) 5356} \end{array}$$

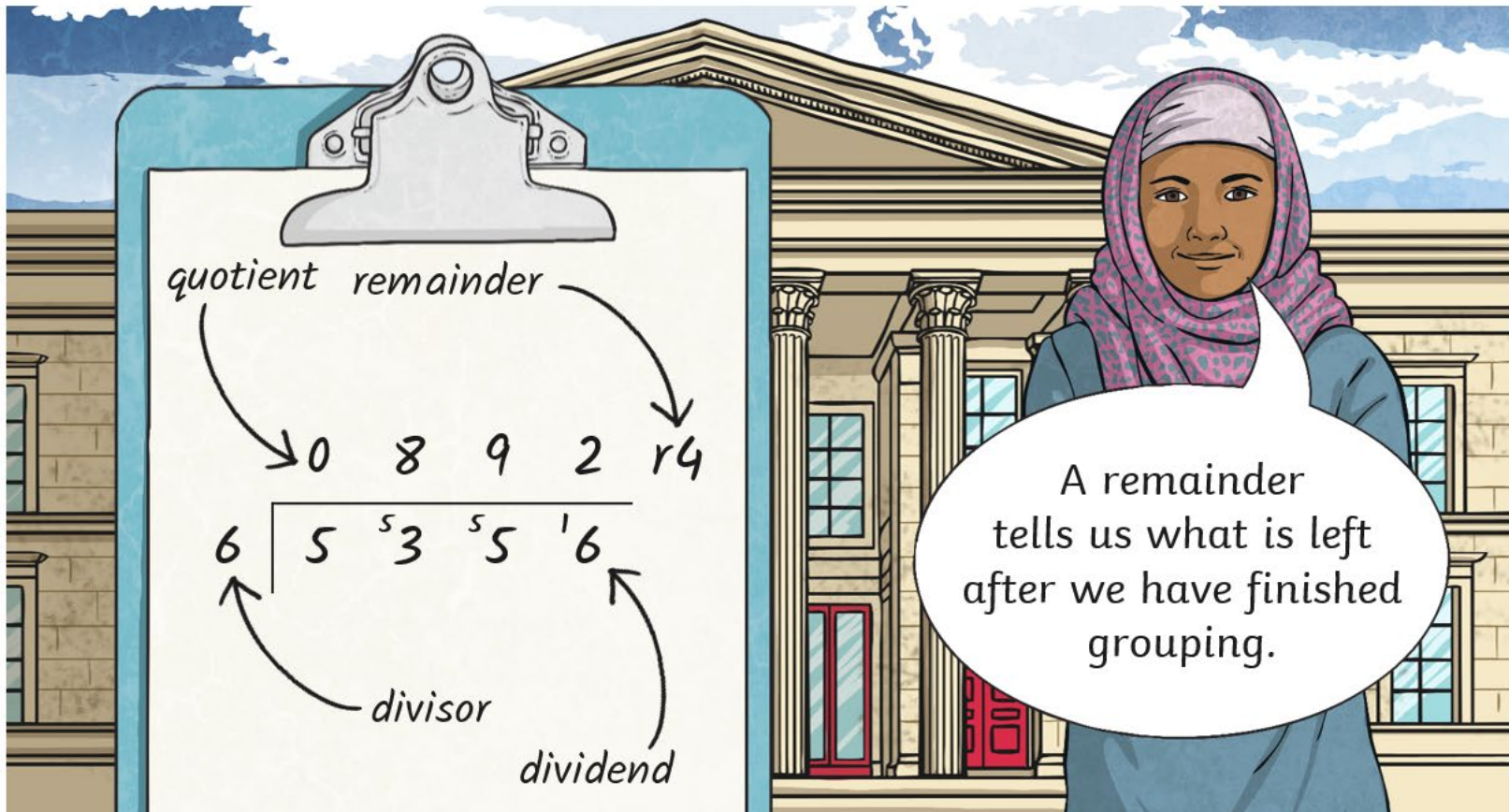
Labels with arrows point to the components of the division:

- quotient** points to the numbers 0, 8, 9, and 2.
- remainder** points to the $\text{r}4$.
- divisor** points to the number 6 on the left.
- dividend** points to the number 5356.

A speech bubble from the woman says: "Sometimes, we are left with a remainder."

Remainders

We use the short method of division to divide by a one-digit number.



The illustration shows a woman wearing a pink and blue patterned hijab and a blue top, standing next to a large blue clipboard. The clipboard has a silver clip at the top and contains a handwritten division problem. The problem is $6 \overline{) 5356}$. Above the quotient line, the digits 0, 8, 9, and 2 are written, followed by a remainder of 4, indicated by 'r4'. Labels with arrows point to these parts: 'quotient' points to the 0, 'remainder' points to the 'r4', 'divisor' points to the 6 on the left, and 'dividend' points to the 5356. A speech bubble from the woman says: 'A remainder tells us what is left after we have finished grouping.'

quotient remainder

0 8 9 2 r4

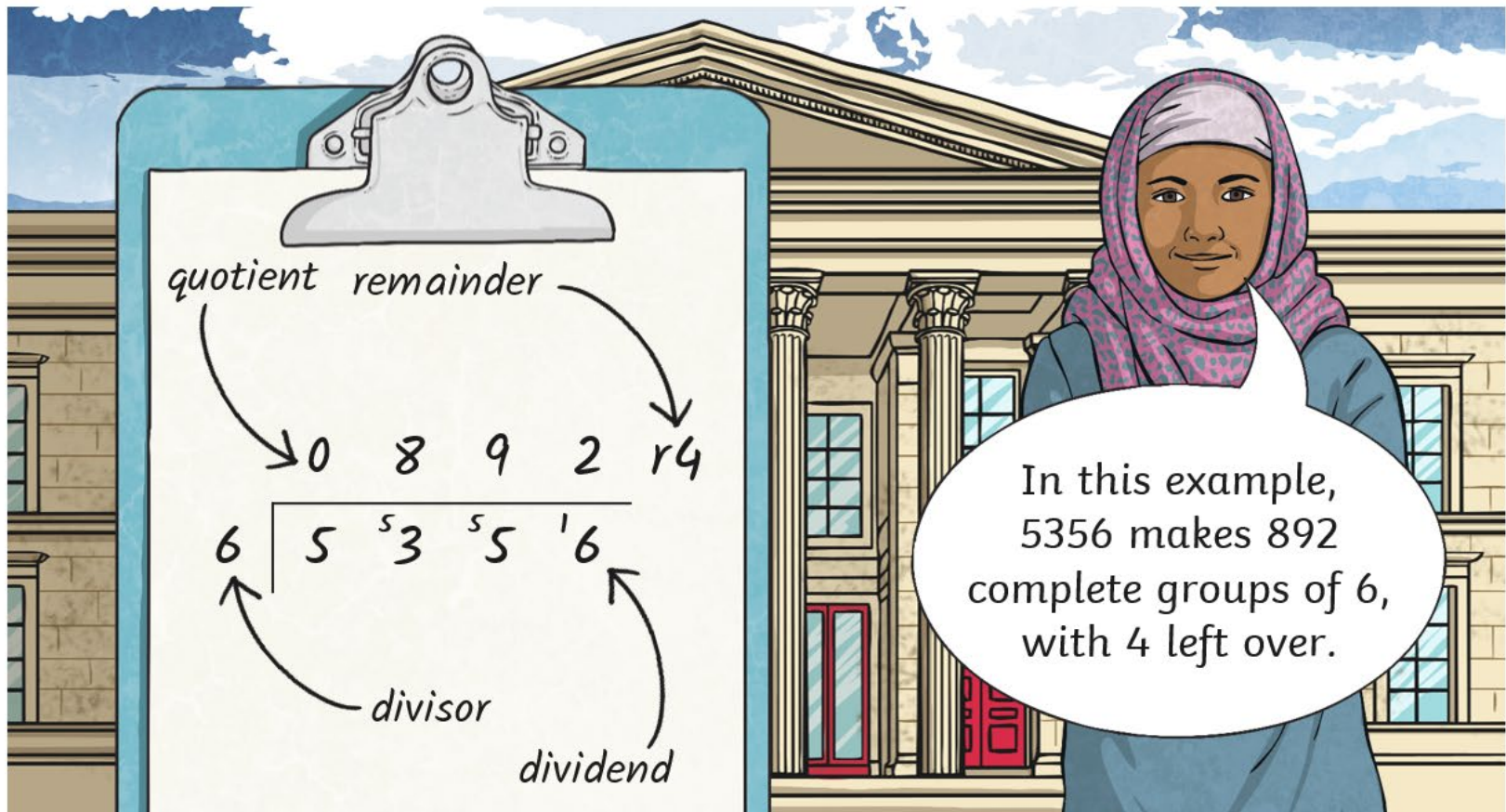
6 $\overline{) 5356}$

divisor dividend

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Remainders

We use the short method of division to divide by a one-digit number.



The illustration shows a woman wearing a pink and blue patterned hijab and a blue top, standing next to a large blue clipboard. The clipboard has a silver clip at the top and contains a division problem. The problem is written as follows:

$$\begin{array}{r} \text{quotient} \quad \text{remainder} \\ 0 \quad 8 \quad 9 \quad 2 \quad r4 \\ 6 \overline{) 5356} \\ \text{divisor} \quad \text{dividend} \end{array}$$

Arrows point from the labels to the corresponding parts of the division: 'quotient' points to '0 8 9 2', 'remainder' points to 'r4', 'divisor' points to '6', and 'dividend' points to '5356'. The numbers in the dividend are grouped with superscripts: 5^s, 3^s, 5^s, and 6['].

In this example, 5356 makes 892 complete groups of 6, with 4 left over.

Writing Remainders as Whole Numbers



When we write a remainder like this,
we are giving a **whole-number remainder**.



Writing Remainders as Whole Numbers



When we write a remainder like this,
we are giving a **whole-number remainder**.

*Solve these, expressing your
remainder as a whole number:*

$$4521 \div 5 =$$

$$2499 \div 4 =$$



Writing Remainders as Whole Numbers



When we write a remainder like this,
we are giving a **whole-number remainder**.

$$4521 \div 5 = 904r1$$

4521 people were grouped
equally into 5 seating areas.

How many were in each area?



Writing Remainders as Whole Numbers



When we write a remainder like this,
we are giving a **whole-number remainder**.

*In some contexts, we must give
remainders as whole numbers.*

$$2499 \div 4 = 624r3$$

*2499 hats were shared equally
between 4 shops.*

*How many were delivered to
each shop?*



Writing Remainders as Whole Numbers



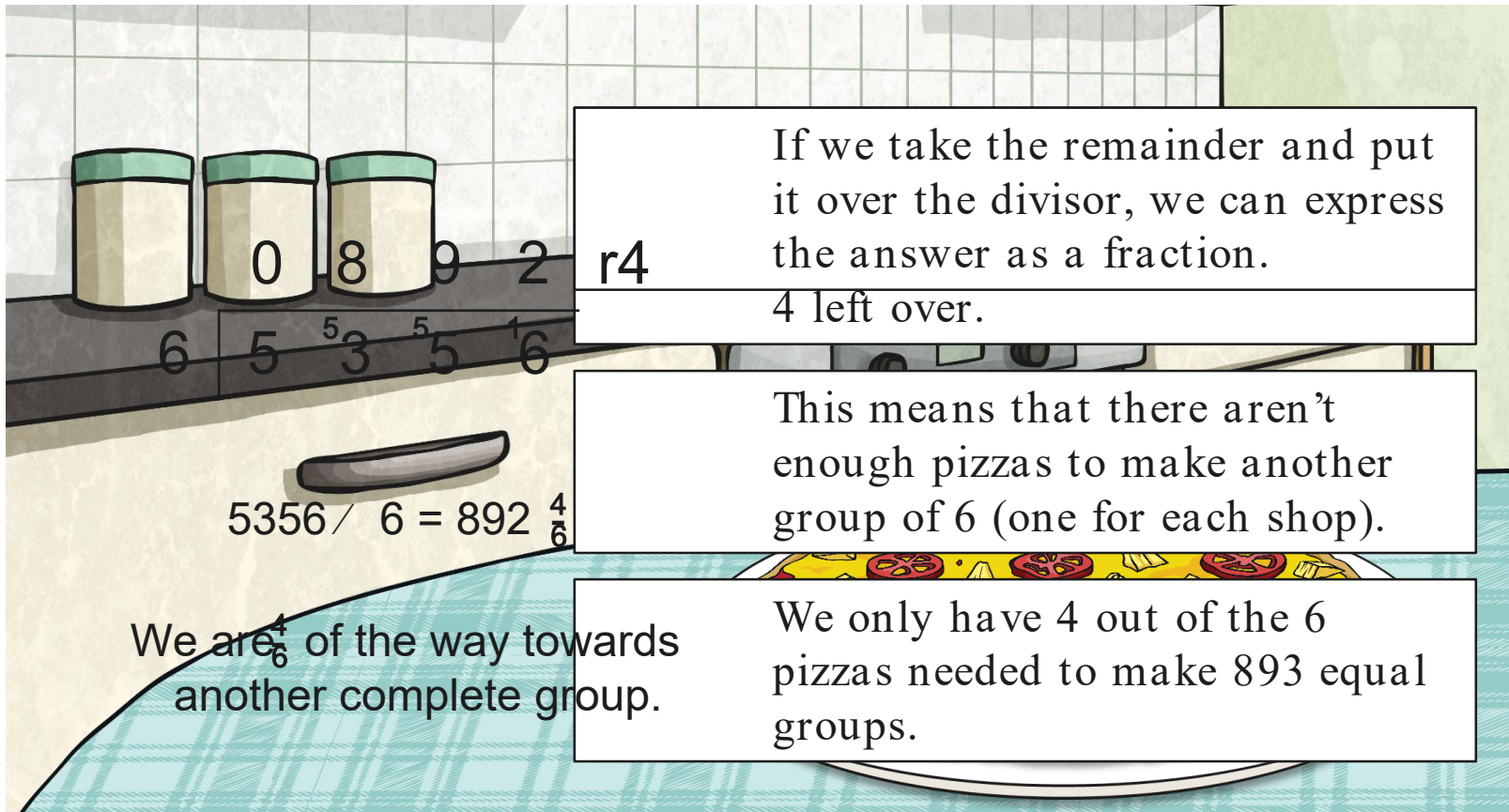
When we write a remainder like this,
we are giving a **whole-number remainder**.

*We can't divide up and share
out the remaining people or
hats, so we have to give
whole-number remainders.*



Writing Remainders as Fractions

Let's look at this calculation again. This time, imagine that we are sharing pizzas. With pizzas, it is possible to cut up the remainder and share it out.



5356 / 6 = 892 $\frac{4}{6}$

We are $\frac{4}{6}$ of the way towards another complete group.

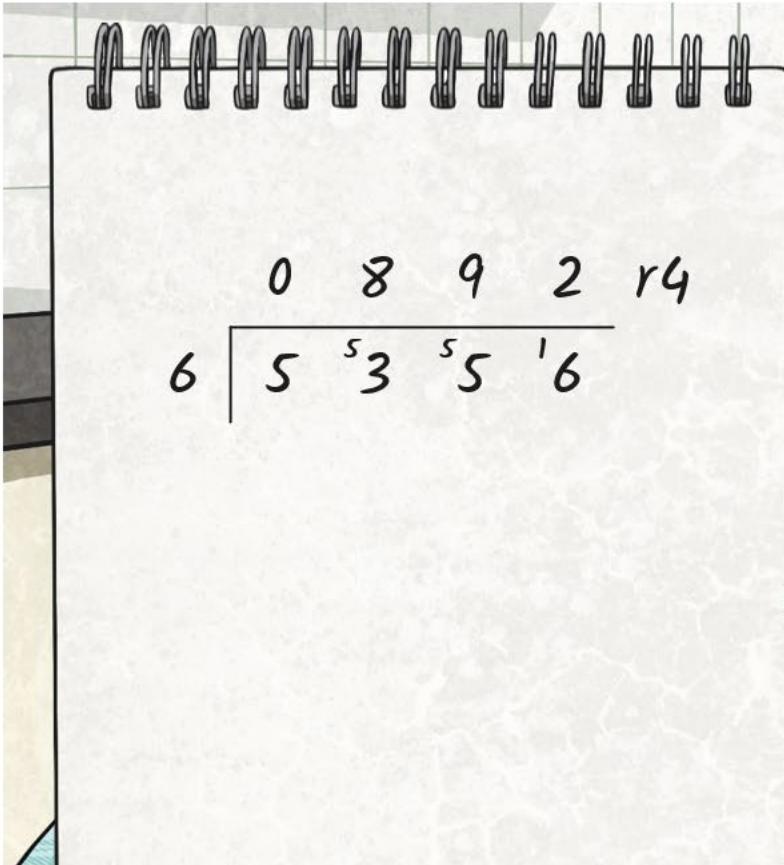
If we take the remainder and put it over the divisor, we can express the answer as a fraction.
4 left over.

This means that there aren't enough pizzas to make another group of 6 (one for each shop).

We only have 4 out of the 6 pizzas needed to make 893 equal groups.

Writing Remainders as Fractions

Let's look at this calculation again. This time, imagine that we are sharing pizzas. With pizzas, it is possible to cut up the remainder and share it out.


$$\begin{array}{r} 0 \ 8 \ 9 \ 2 \ r4 \\ 6 \overline{) 5 \ 3 \ 5 \ 6} \end{array}$$

5356 pizzas shared equally between 6 shops would give an answer of 892 whole pizzas with 4 left over.

This means that there aren't enough pizzas to make another group of 6 (one for each shop).

We only have 4 out of the 6 pizzas needed to make 893 equal groups.

Writing Remainders as Fractions

Let's look at this calculation again. This time, imagine that we are sharing pizzas. With pizzas, it is possible to cut up the remainder and share it out.

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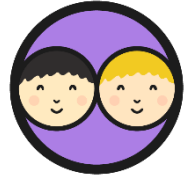
$$5356 \div 6 = 892 \frac{4}{6}$$

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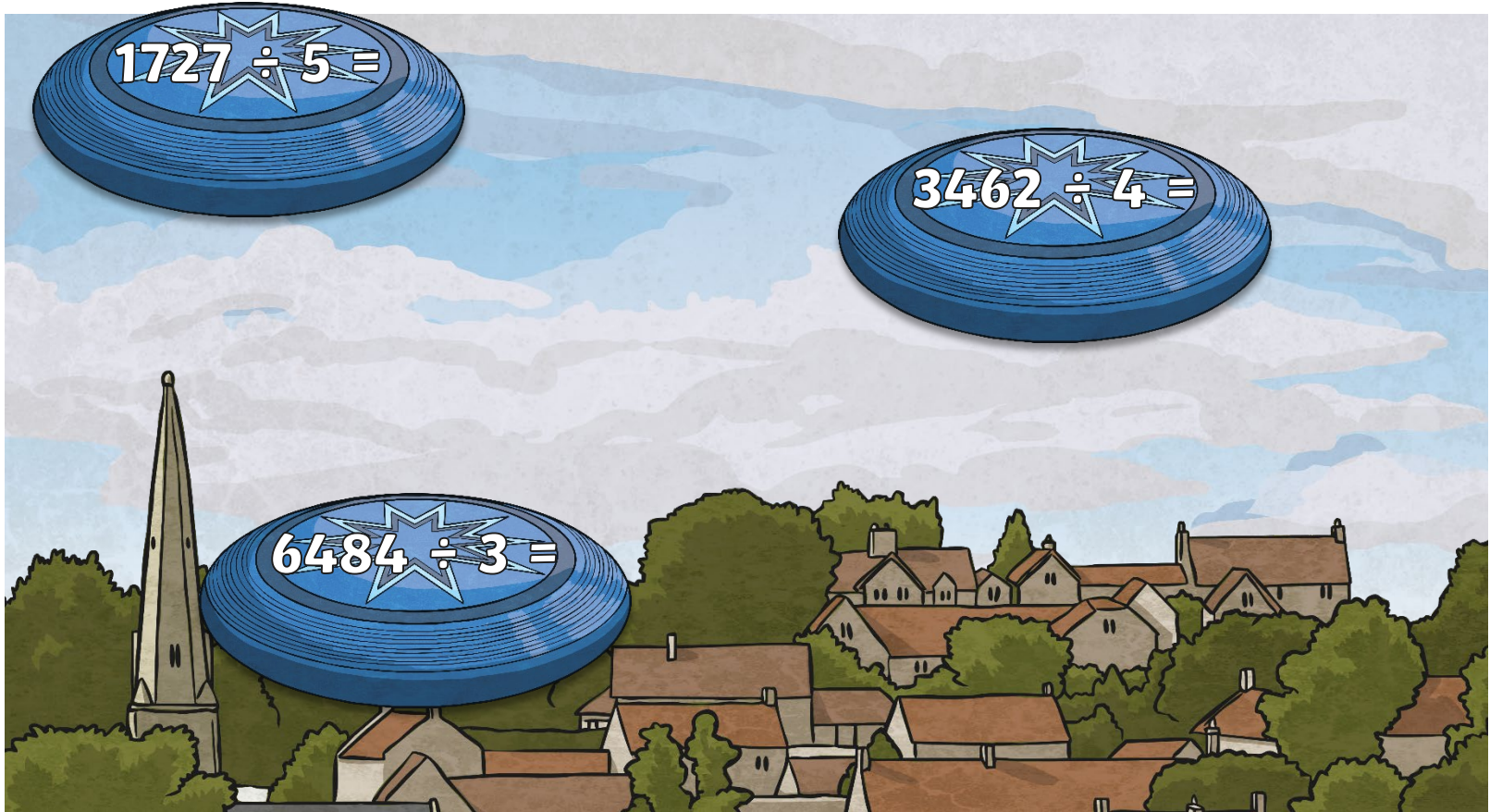
If we take the remainder and put it over the divisor, we can express the answer as a fraction.



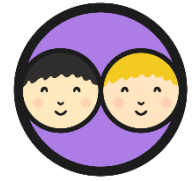
Your Turn!



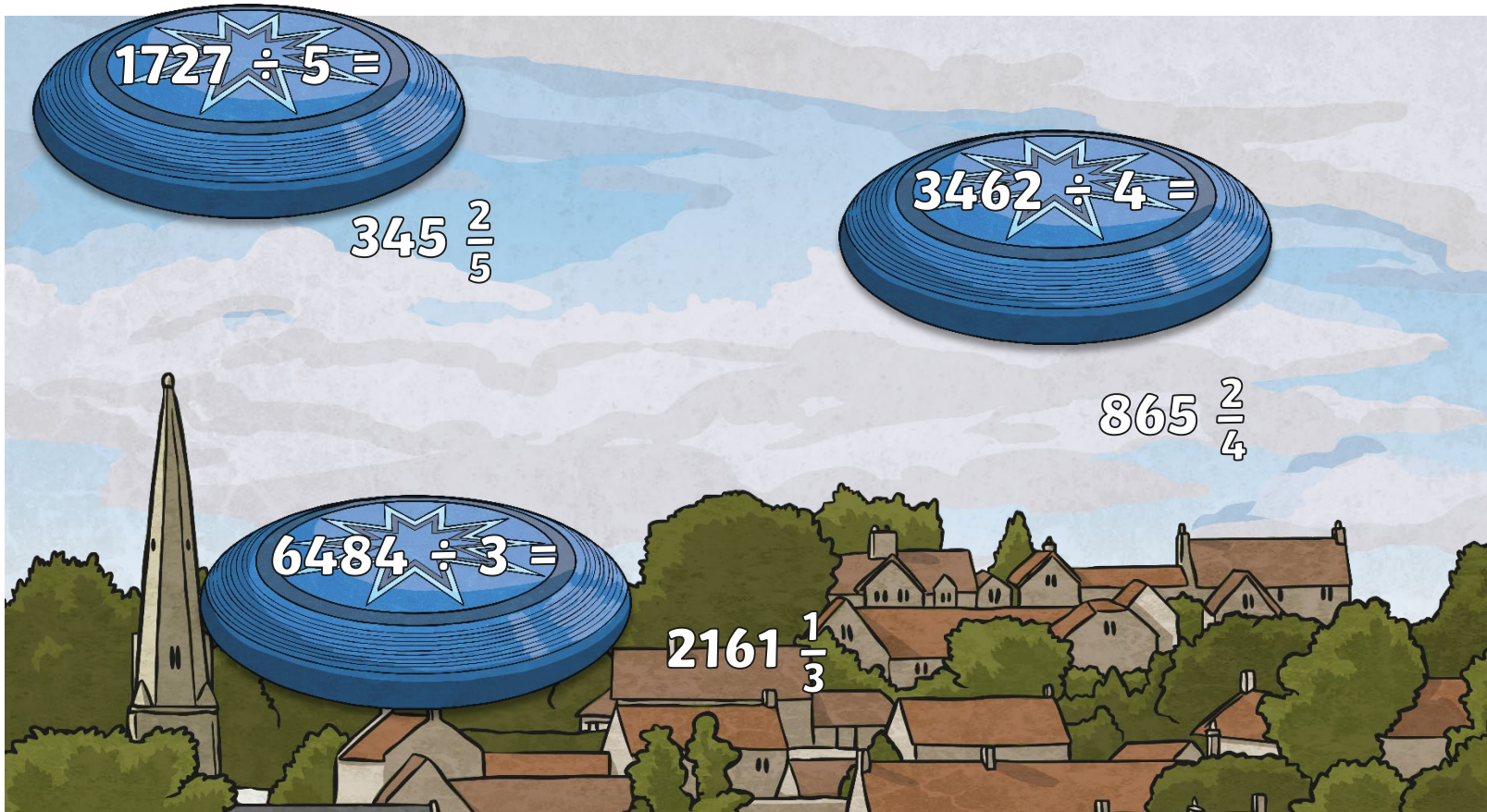
Work in pairs. Can you express these remainders as fractions?



Your Turn!



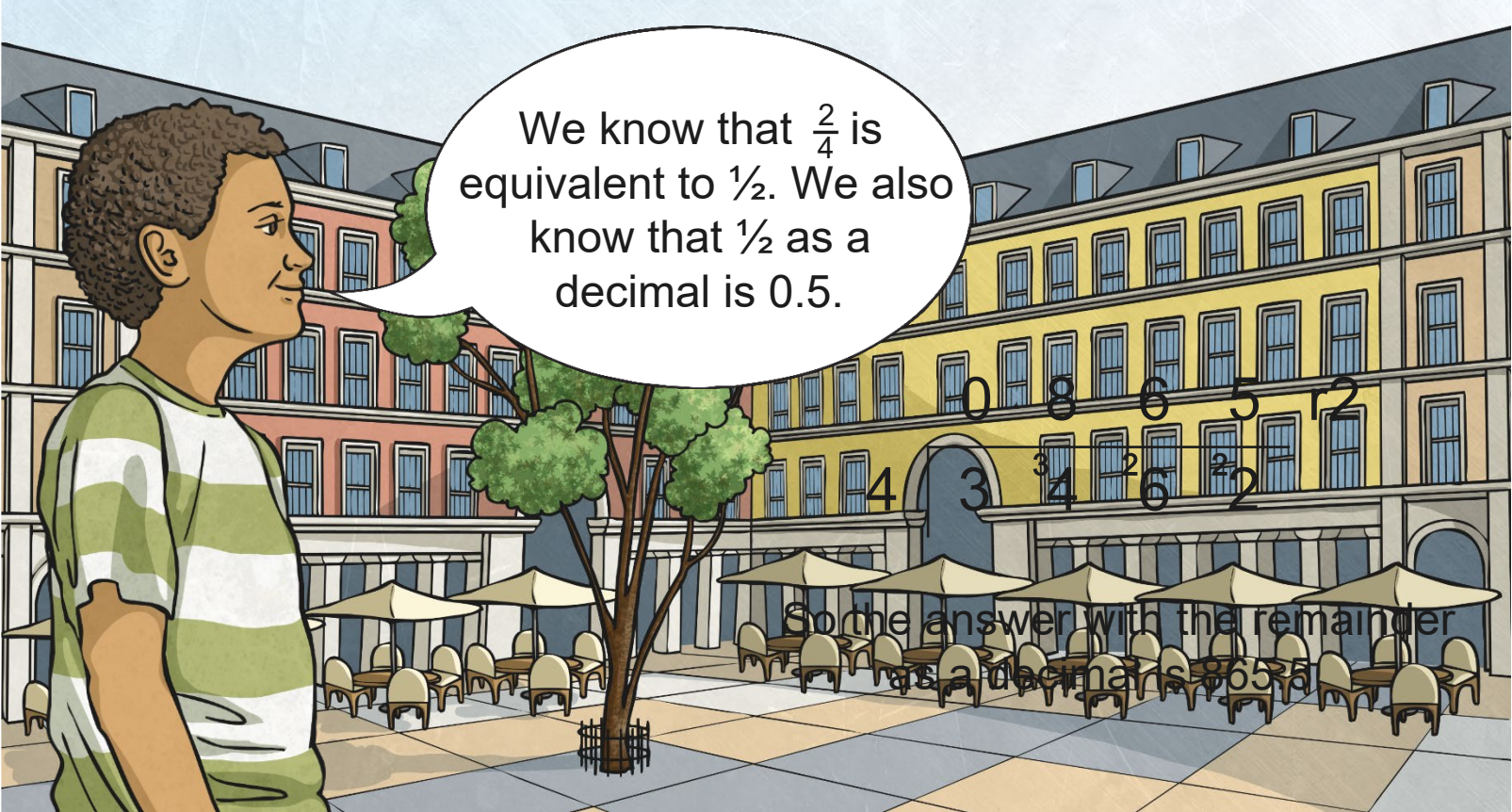
Work in pairs. Can you express these remainders as fractions?



Writing Remainders as Decimals

Sometimes it is easy to write the remainder as a decimal.

Let's look again at the second calculation.

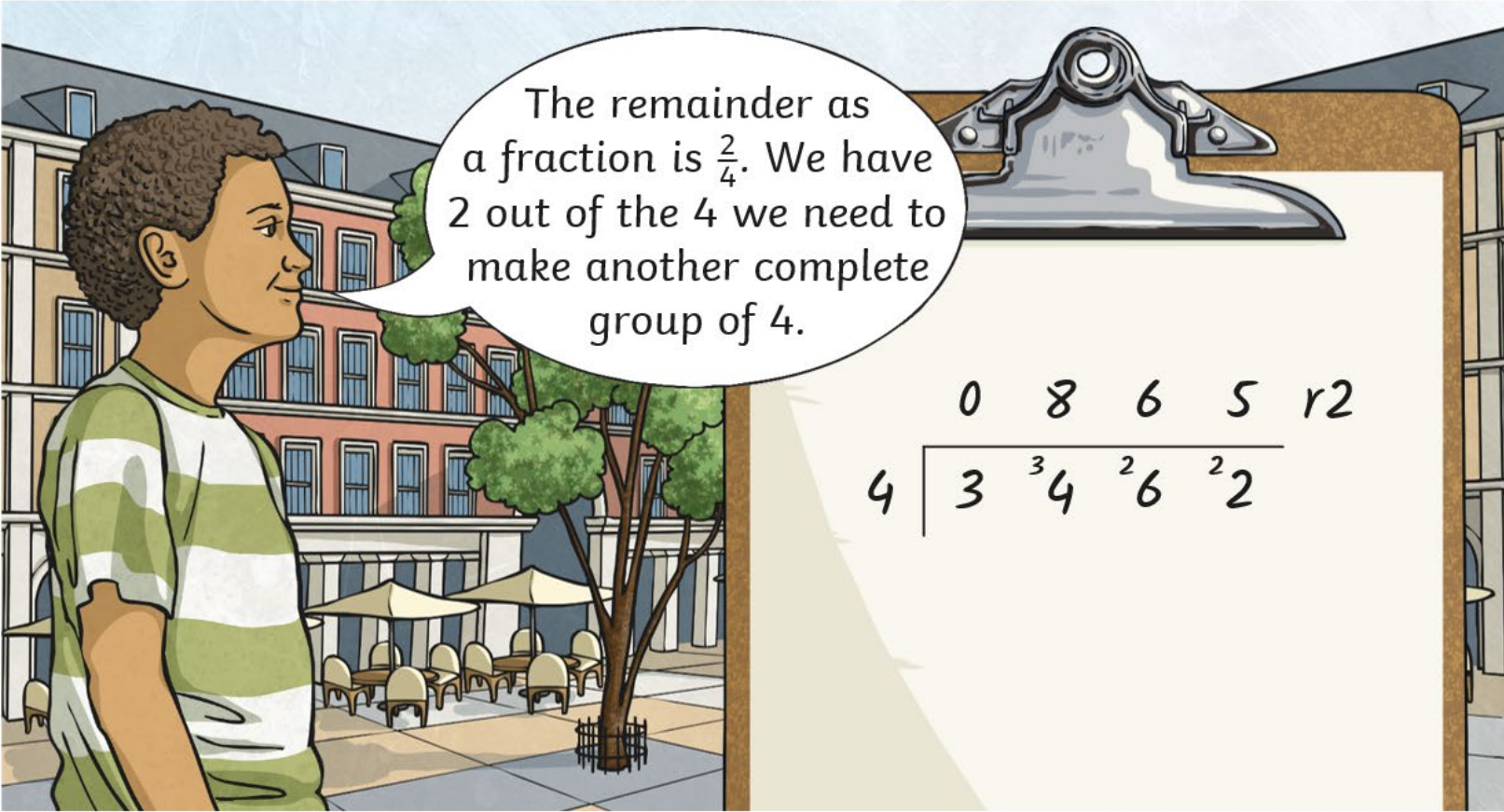


We know that $\frac{2}{4}$ is equivalent to $\frac{1}{2}$. We also know that $\frac{1}{2}$ as a decimal is 0.5.

So the answer with the remainder as a decimal is 865.5

Writing Remainders as Decimals

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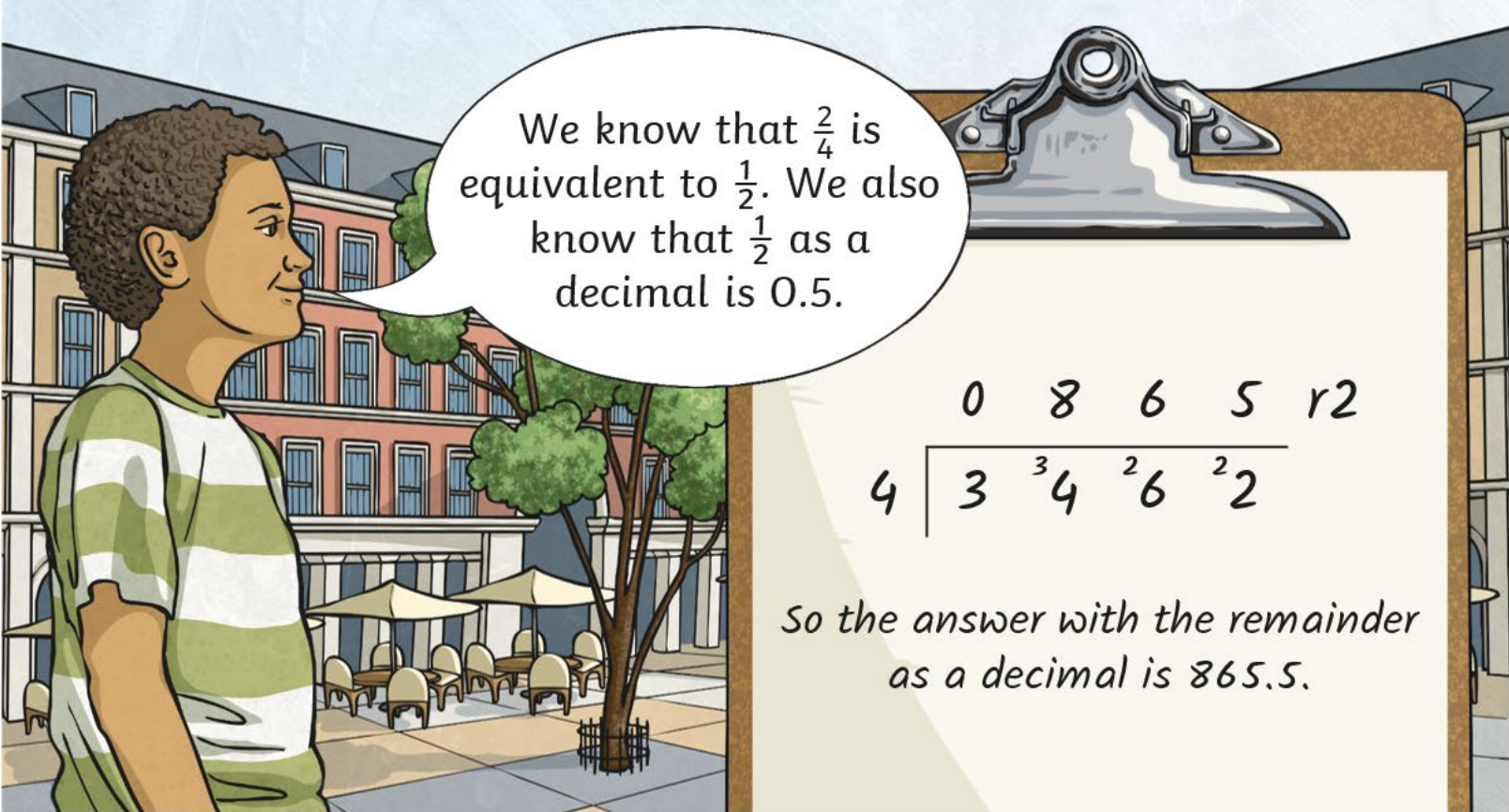


The remainder as a fraction is $\frac{2}{4}$. We have 2 out of the 4 we need to make another complete group of 4.

$$\begin{array}{r} 0 \ 8 \ 6 \ 5 \ r2 \\ 4 \overline{) 3 \ 4 \ 6 \ 2} \end{array}$$

Writing Remainders as Decimals

Sometimes it is easy to write the remainder as a decimal.
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We know that $\frac{2}{4}$ is equivalent to $\frac{1}{2}$. We also know that $\frac{1}{2}$ as a decimal is 0.5.

$$\begin{array}{r} 0 \ 8 \ 6 \ 5 \ r2 \\ 4 \overline{) 3 \ 4 \ 6 \ 2} \end{array}$$

So the answer with the remainder as a decimal is 865.5.

Taxi Driver Remainders



Here is a division problem using larger numbers:

Over 5 days, a taxi driver drove 1228 miles.
How many miles did the taxi driver drive on average each day?

Before beginning to calculate, we can see that the answer is going to have a remainder as we know that 28 isn't divisible by 5. We want to write the remainder as a decimal, so first we put a decimal point after the dividend and in the answer box above it. Then, we put zeros in the tenths and hundredths position ready for calculating the decimal remainder.

We can calculate the answer to this problem using short division. We set out a short division calculation like this:

5	1	2	2	8	0	0

Short Division

Let's remind ourselves how to use the formal written method of short division to calculate how far on average the taxi driver drove each day.

		2			•	
5	1	2	² 2	8	•	0 0

Step 1: Calculate $12 \div 5 = 2r2$

Write the whole number in the top box and write the remainder in front of the next digit.

Short Division

Let's remind ourselves how to use the formal written method of short division to calculate how far on average the taxi driver drove each day.

		2	4		•	
5	1	2	² 2	² 8	• 0	0

Step 2: Calculate $22 \div 5 = 4\text{r}2$

Write the whole number in the top box and write the remainder in front of the next digit.

Short Division

Let's remind ourselves how to use the formal written method of short division to calculate how far on average the taxi driver drove each day.

		2	4	5	•	
5	1	2	² 2	² 8	• ³ 0	0

Step 3: Calculate $28 \div 5 = 5\text{r}3$

Write the whole number in the top box and write the remainder in front of the zero after the decimal point.

Short Division

Let's remind ourselves how to use the formal written method of short division to calculate how far on average the taxi driver drove each day.

		2	4	5	• 6	
5	1	2	² 2	² 8	• ³ 0	0

We have calculated that the taxi driver drove **245.6 miles** on average each day.

Step 4: Calculate $30 \div 5 = 6$

Write the whole number in the top box. There is no remainder, so this is the end of the calculation.

Aeroplane Decimal Remainders



Work with a partner to answer this word problem that involves decimal remainders using short division.

Over 4 days, a pilot flew his aeroplane 2779 miles.
How many miles did the pilot fly on average each day?

4	2	7	7	9	0	0

Aeroplane Decimal Remainders



Work with a partner to answer this word problem that involves decimal remainders using short division.

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How many miles did the pilot fly on average each day?

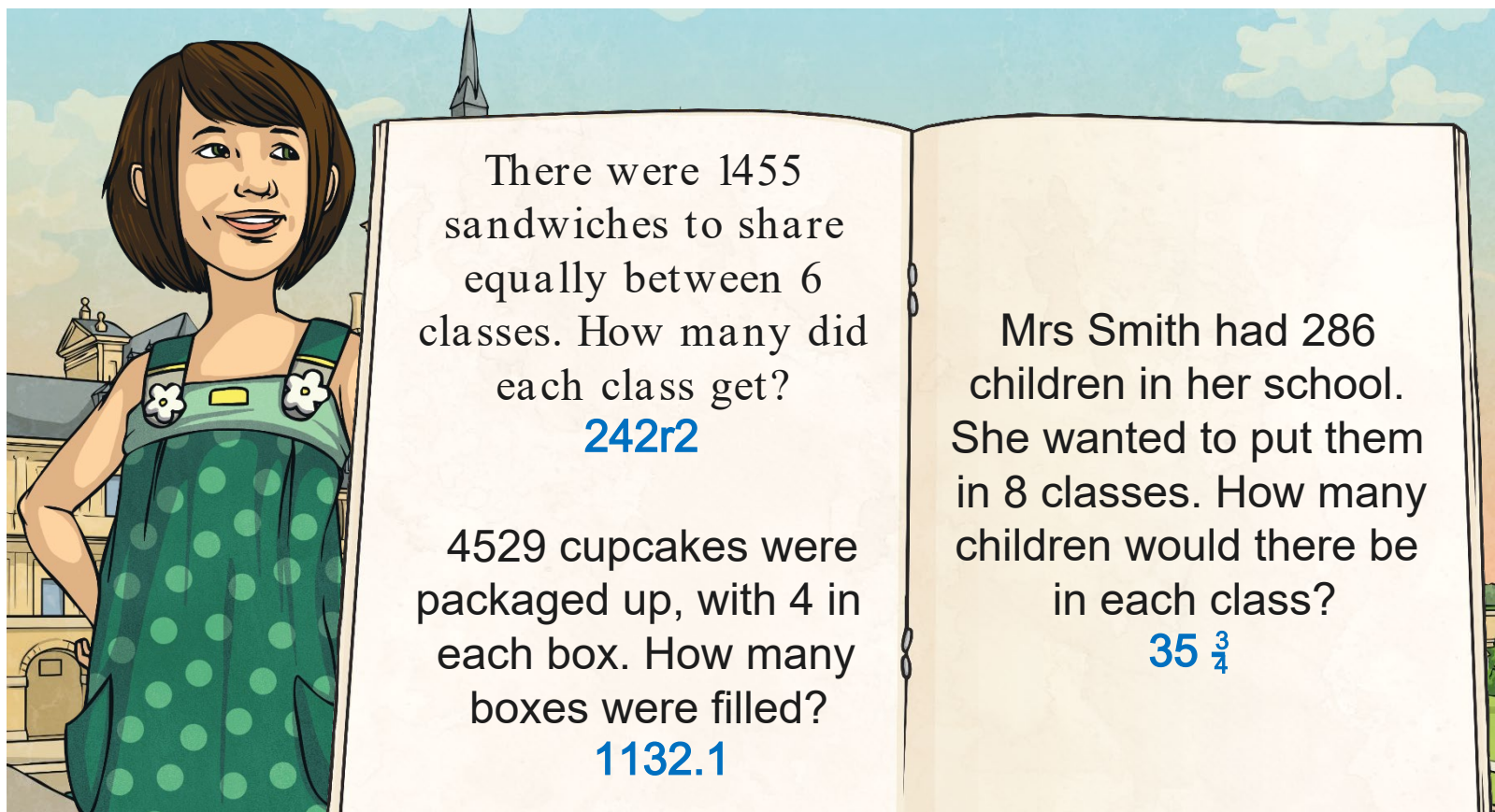
		6	9	4	•	7	5
4	2	7	³ 7	¹ 9	•	³ 0	² 0

The pilot flew
694.75 miles
on average
each day.

Which Way?



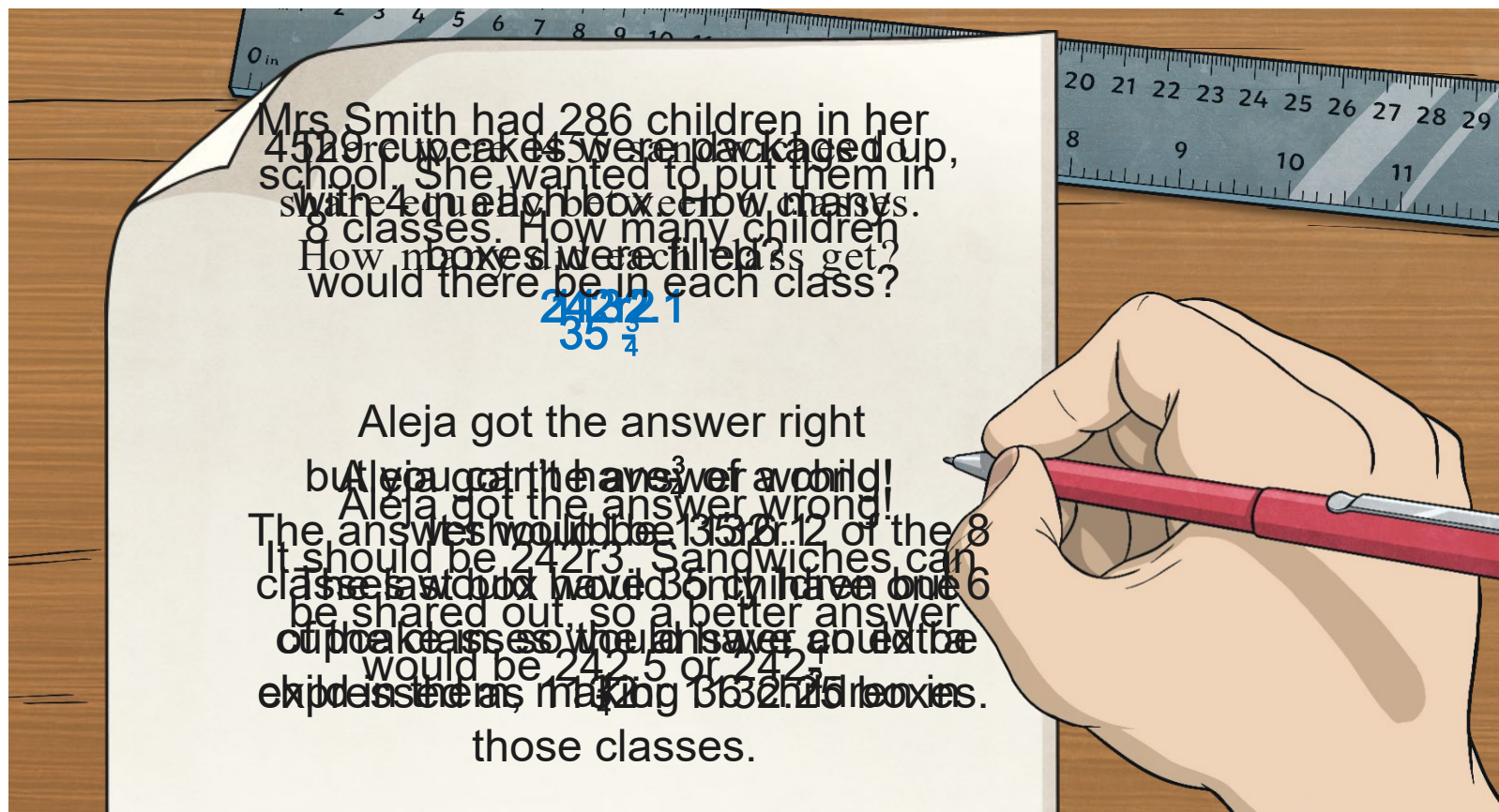
Has Aleja chosen the most appropriate way to express her remainders?
Check her answers and discuss your ideas with your partner.



Which Way? Answers



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Which Way? Answers

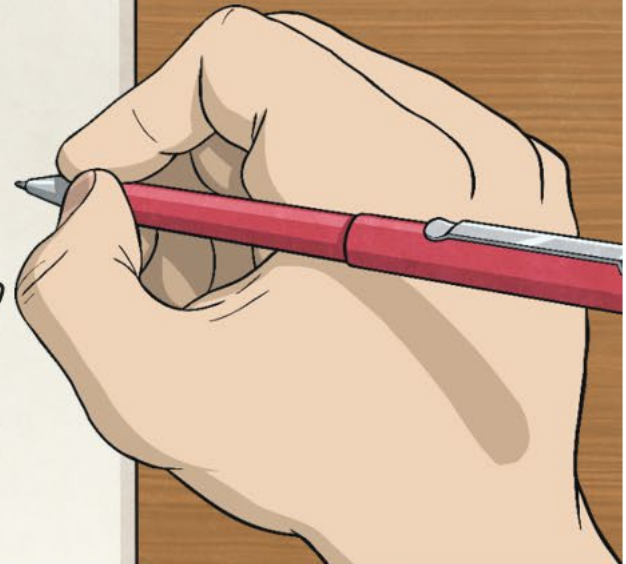


Has Aleja chosen the most appropriate way to express her remainders?
Check her answers and discuss your ideas with your partner.

There were 1455 sandwiches to
share equally between 6 classes.
How many did each class get?

242r2

*Aleja got the answer wrong!
It should be 242r3. Sandwiches can
be shared out, so a better answer
would be 242.5 or $242\frac{1}{2}$.*



Which Way? Answers



Has Aleja chosen the most appropriate way to express her remainders?
Check her answers and discuss your ideas with your partner.

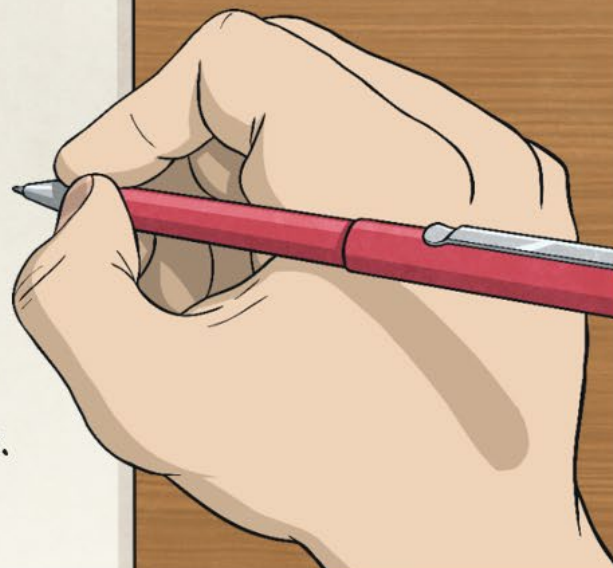
4529 cupcakes were packaged up,
with 4 in each box. How many
boxes were filled?

1132.1

Aleja got the answer wrong!

It should be 1132r1.

*The last box would only have one
cupcake in, so the answer could be
expressed as $1132 \frac{1}{4}$ or 1132.25 boxes.*



Which Way? Answers

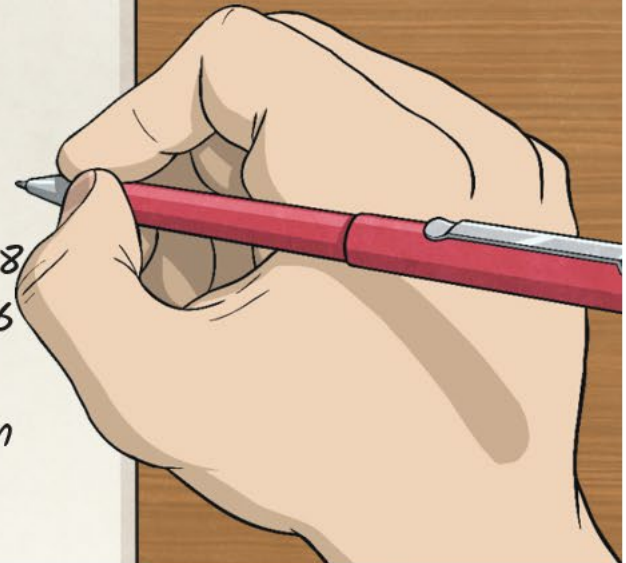


Has Aleja chosen the most appropriate way to express her remainders?
Check her answers and discuss your ideas with your partner.

Mrs Smith had 286 children in her school. She wanted to put them in 8 classes. How many children would there be in each class?

$$35 \frac{3}{4}$$

*Aleja got the answer right
but you can't have $\frac{3}{4}$ of a child!
The answer would be 35r6. 2 of the 8
classes would have 35 children but 6
of the classes would have an extra
child in them, making 36 children in
those classes.*



twinkl