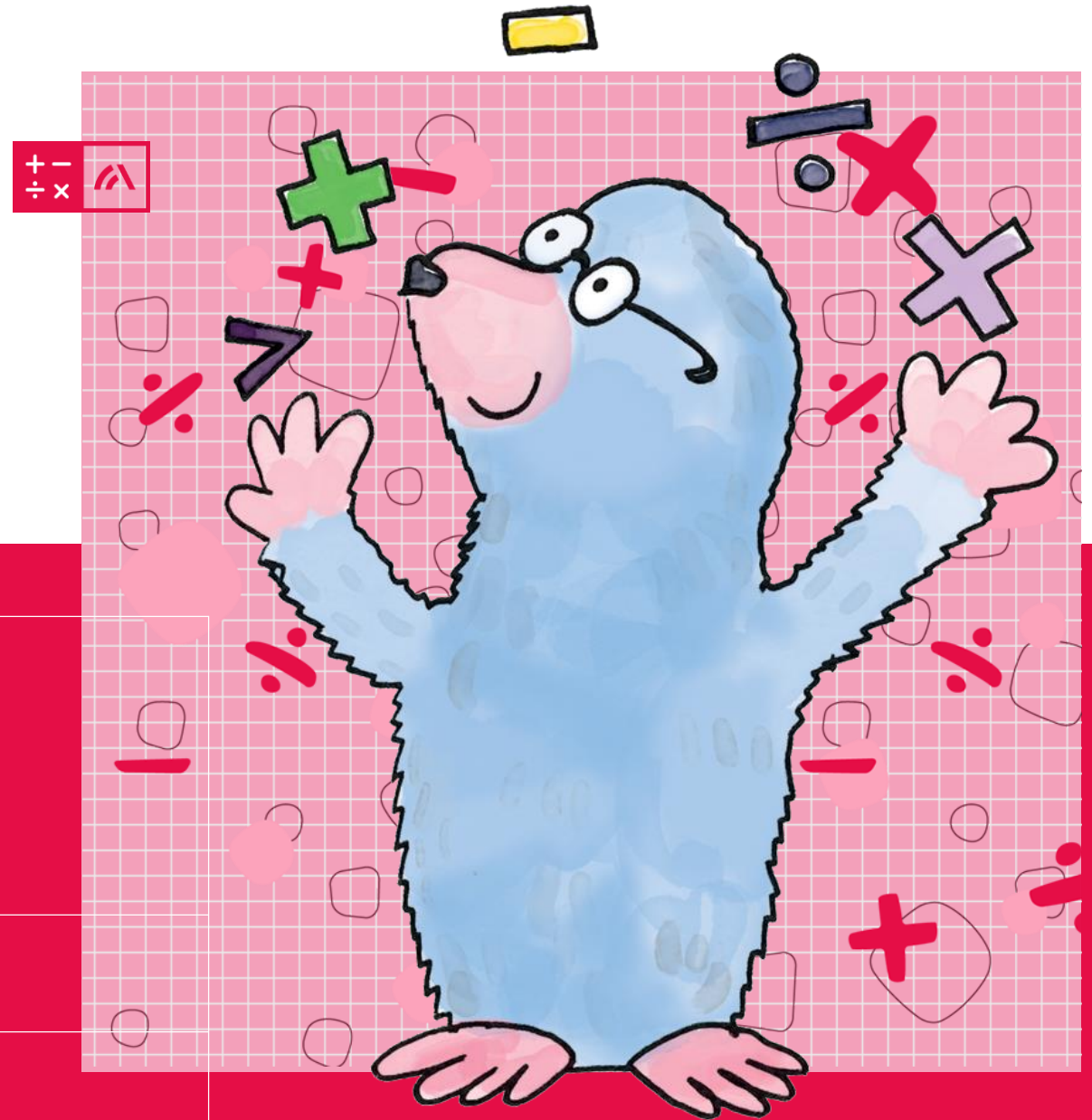


Year 3 Unit 4: Addition and subtraction

Week 3: Subtracting 3-digit numbers and solving word problems

Mathematics
Mastery



Year 3 Unit 4: Addition and subtraction



Mathematics
Mastery

Lesson 10: Subtracting 3-digit numbers, regrouping 10s to 1s

- Subtracting 3-digit numbers using column subtraction

Lesson 11: Subtracting 3-digit numbers, regrouping 100s to 10s

- Subtracting 3-digit numbers using column subtraction

Lesson 12: Subtracting 3-digit numbers, regrouping in multiple columns

- Subtracting 3-digit numbers using column subtraction

Lesson 13: Addition and subtraction word problems

- Solving word problems using addition and subtraction skills

Lesson 14: Word problems with tricky unknown values

- Interpreting and representing addition and subtraction problems with bar models

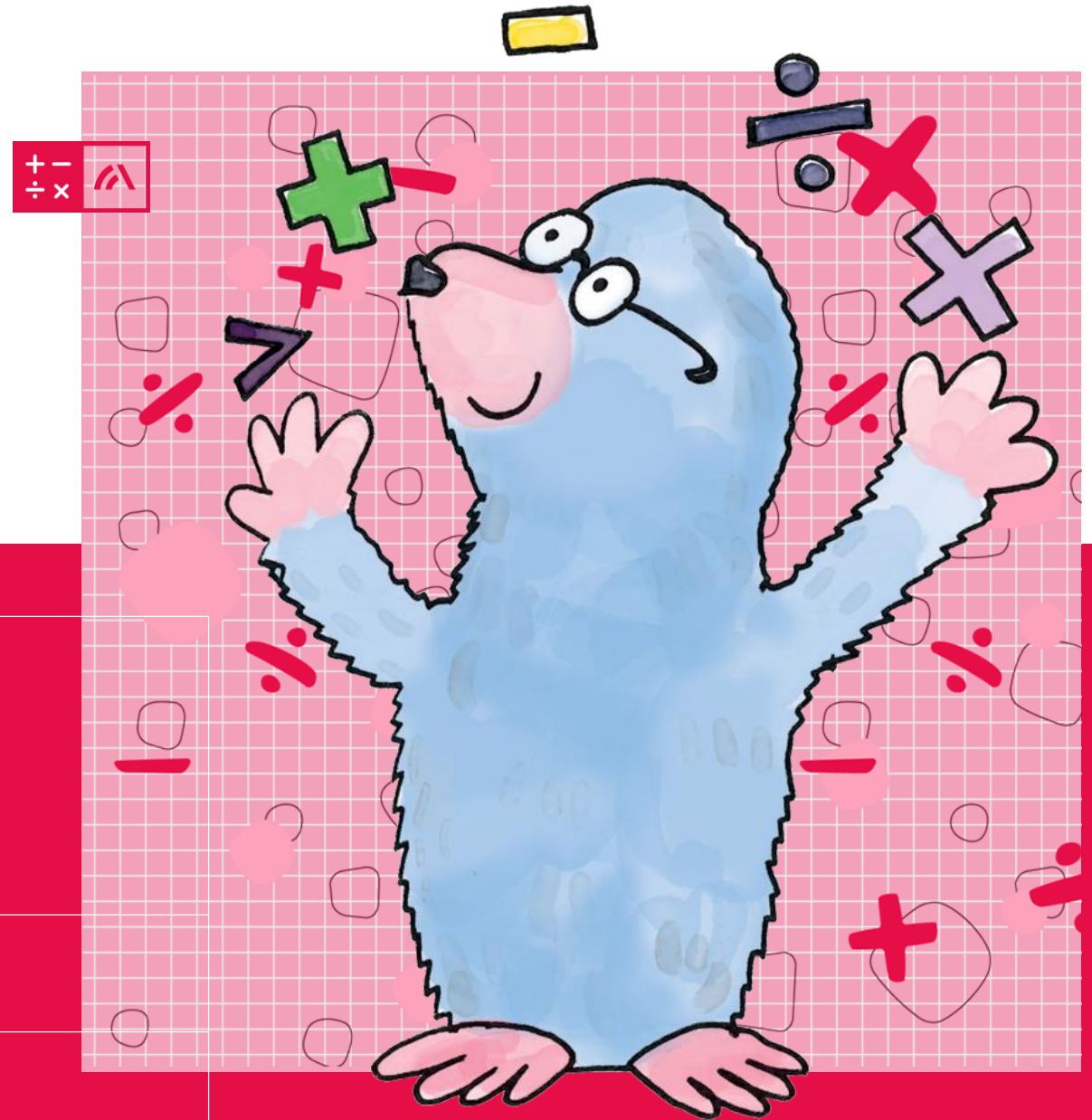
This Week



Year 3 Unit 4: Addition and subtraction

Lesson 10: Subtracting 3-digit numbers, regrouping 10s to 1s

Mathematics
Mastery



Calculating subtractions using mental strategies



Do Now

Try to solve these calculations mentally.
Which is the odd one out? Why is that?

$$384 - 263$$

$$567 - 234$$

$$361 - 227$$

$$443 - 212$$

$$475 - 255$$

$$674 - 462$$



Key learning: To subtract 3-digit numbers using column subtraction



subtraction

subtract

minus



part

whole

number bond



regrouping

partition

inverse

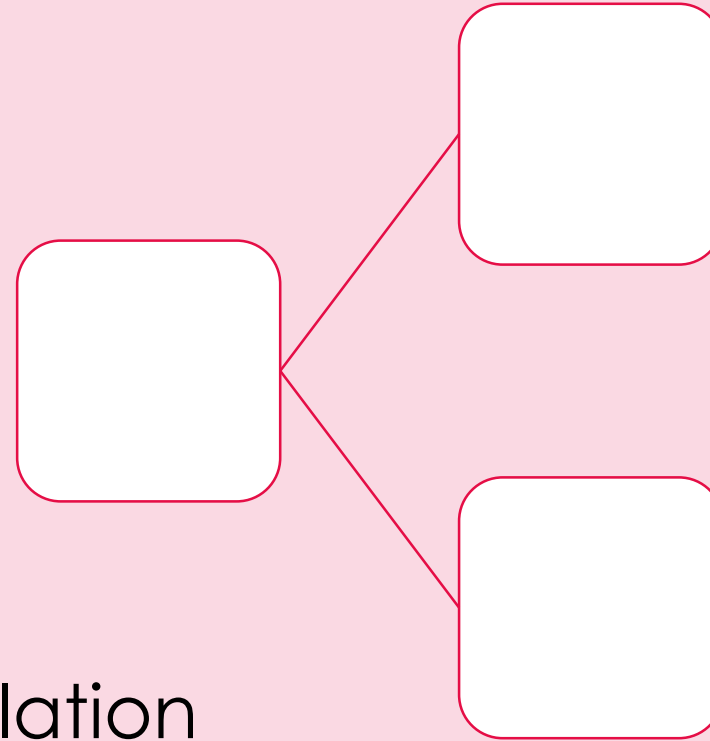


Star Words



Identifying when subtractions will require regrouping

$$\boxed{361} - \boxed{227} = \boxed{}$$



What information is known?

What information is unknown?

How could you represent the calculation using a part-whole model?



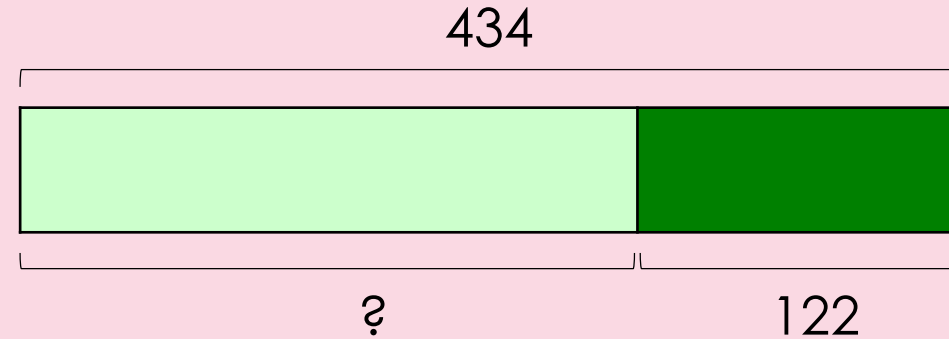
Identifying when subtractions will require regrouping

Which of these calculations needs regrouping?

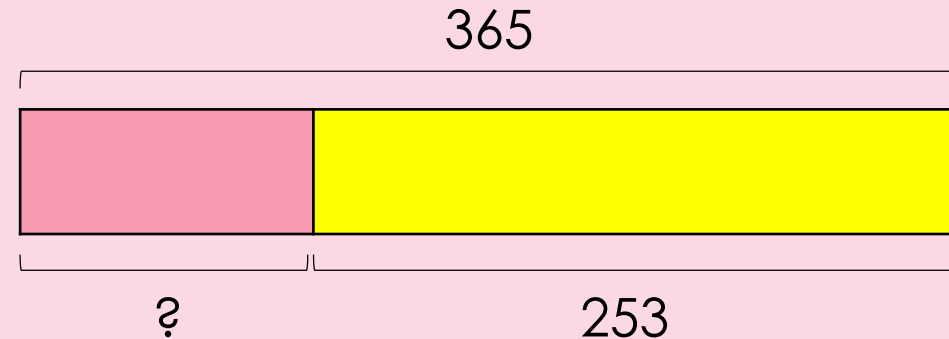
How do you know?

Use part-whole language in your answer to show which number you are describing.

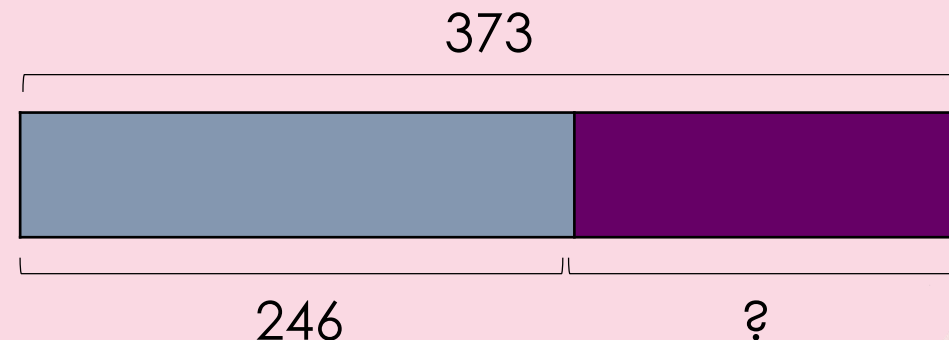
$$434 - 122$$



$$365 - 253$$



$$373 - 246$$



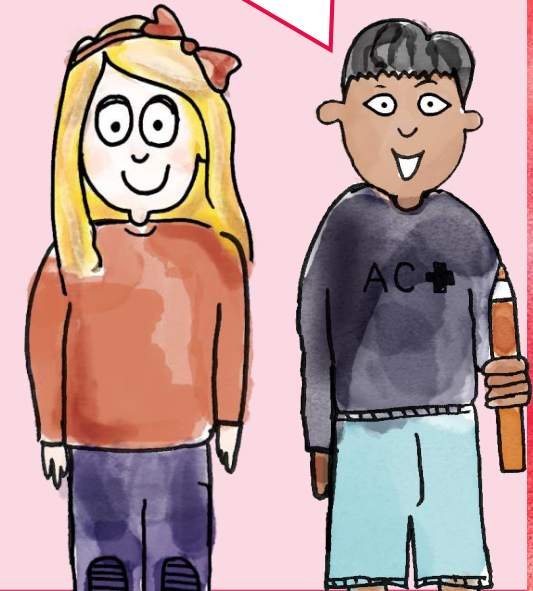
Identifying when column subtraction requires regrouping from tens to ones

$$253 - 126$$

- Represent the whole in the calculation with Dienes.
- Identify whether the calculation needs regrouping.
- Explain how you know.
- Calculate the subtraction of ones mentally.
- Then represent it with Dienes.

The whole is 253, which is 2 hundreds, 5 tens and 3 ones.

I think $253 - 126$ will require regrouping because the ones digit in the part is greater than the ones digit in the whole.

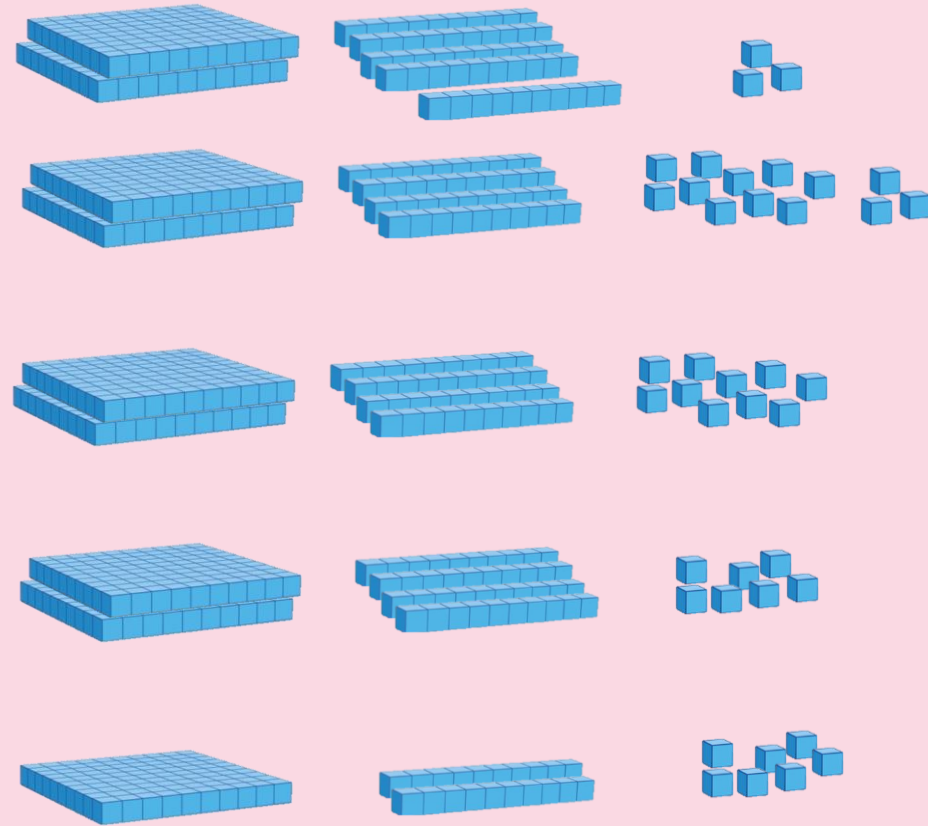


Identifying when column subtraction requires regrouping from tens to ones

$$253 - 126$$

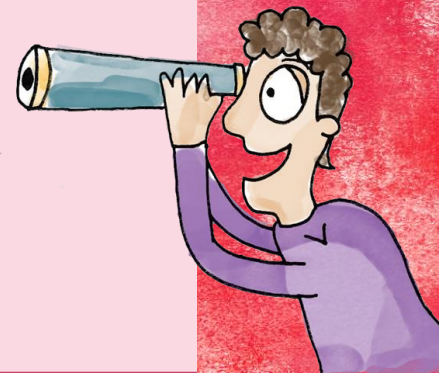
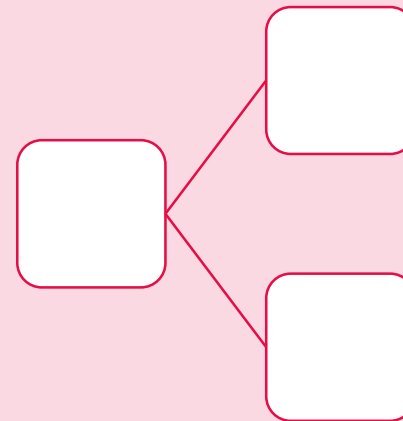
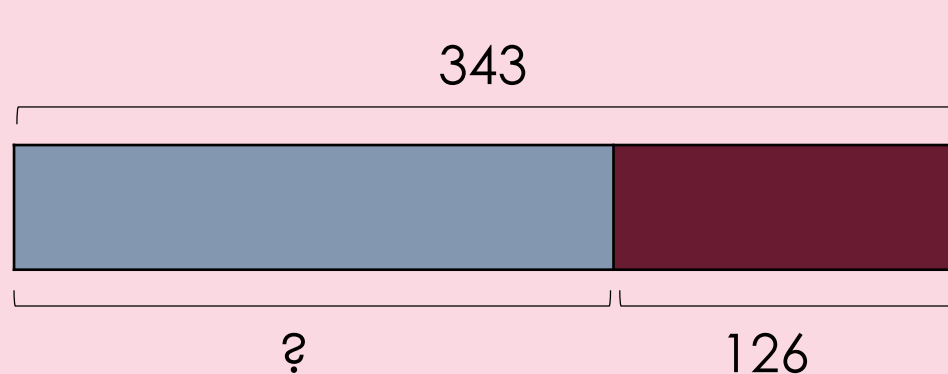


- I am regrouping 1 ten from the whole for 10 ones.
- I am using the 'Make 10' strategy to subtract 3 and make 10.
- I have 3 more to subtract, which gives 7.
- Then I can subtract the 1 hundred and 2 tens to get 127.



Column subtraction with regrouping from tens to ones

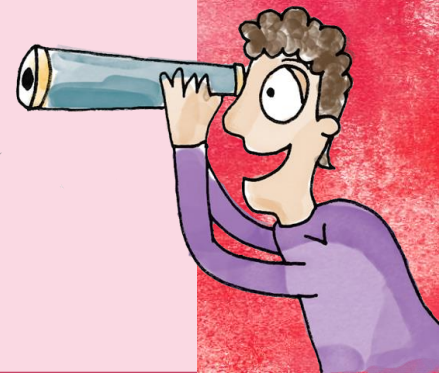
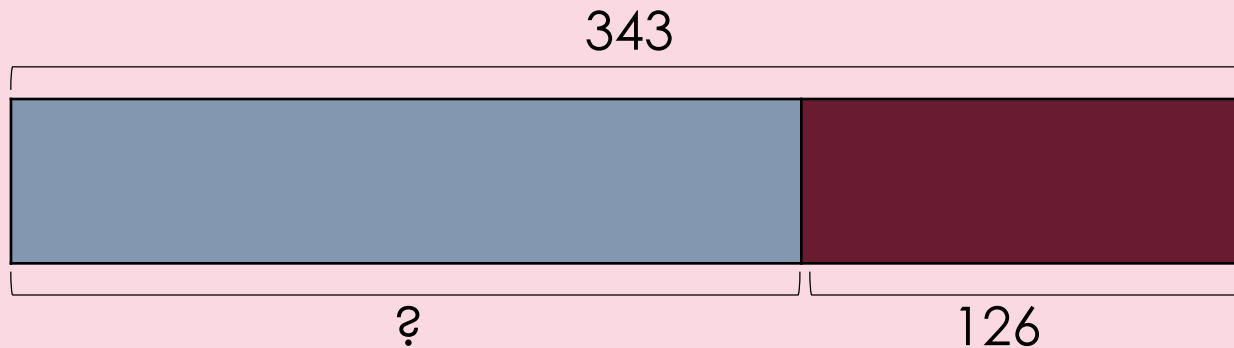
There are 343 pupils at Riverfleet Primary School.
Most of them went on a school trip to Edinburgh Castle,
but 126 stayed at school to meet Olympic cycling
champion Sir Chris Hoy.
How many pupils visited Edinburgh Castle?



Column subtraction with regrouping from tens to ones

Estimate your answer before calculating it.

$$\boxed{343} - \boxed{126} = \boxed{}$$



Key learning: To subtract 3-digit numbers using column subtraction

Column subtraction with regrouping from tens to ones

- Choose a calculation and estimate its solution.
- Identify whether the calculation needs regrouping.
- If not, use a mental strategy to solve it and write the completed equation.
- If it does need regrouping, use column subtraction to calculate the total.
- Check your answer using your estimate.
- Use Dienes on a place-value chart for your first two calculations.
- Be prepared to represent your other calculations with Dienes.

$$452 - 236$$

$$368 - 227$$

$$553 - 235$$

$$354 - 136$$

$$572 - 324$$

$$354 - 122$$



Identifying and explaining an error



- A student completed this calculation.
- Where has a mistake been made?
- How do you know?
- What inverse calculation could you use to check?
- What do you think the student did wrong?
- How would you correct the mistake?

$$\begin{array}{r} 354 \\ - 126 \\ \hline 232 \end{array}$$



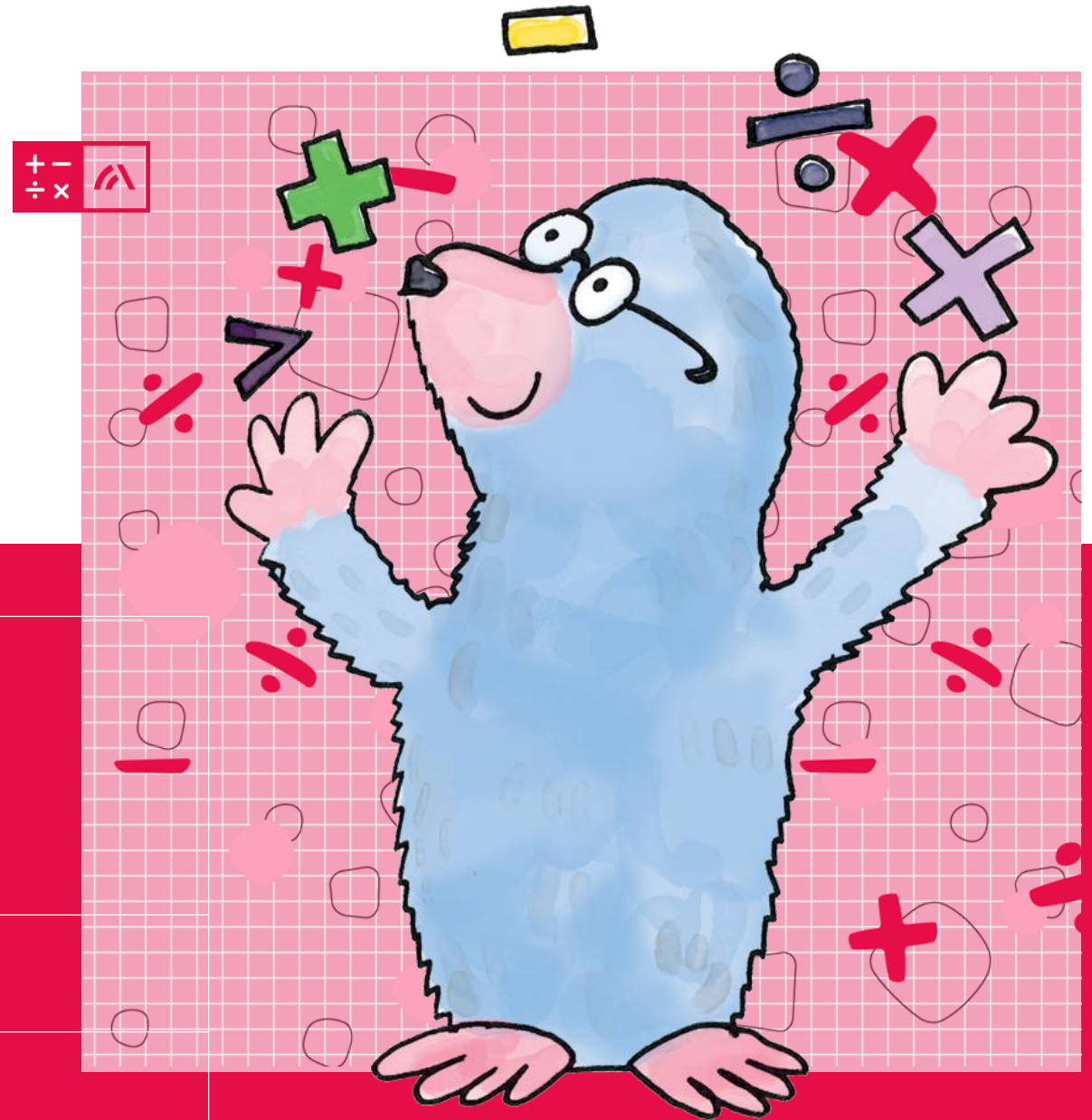
Plenary



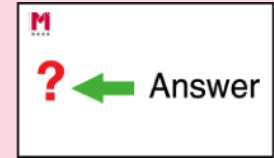
Year 3 Unit 4: Addition and subtraction

Lesson 11: Subtracting 3-digit numbers, regrouping 100s to 10s

Mathematics
Mastery



If I know this, what else do I know?



If this is the answer, how many different questions could be asked?

37



Do Now



Key learning: To subtract 3-digit numbers using column subtraction



subtraction

subtract

minus



part

whole

number bond



regrouping

partition

inverse



Star Words



Identifying when subtractions will require regrouping from hundreds

The Great Hall at Edinburgh Castle can hold 465 people.

The Jacobite Room holds 274 fewer guests.

How many people can the Jacobite Room hold?

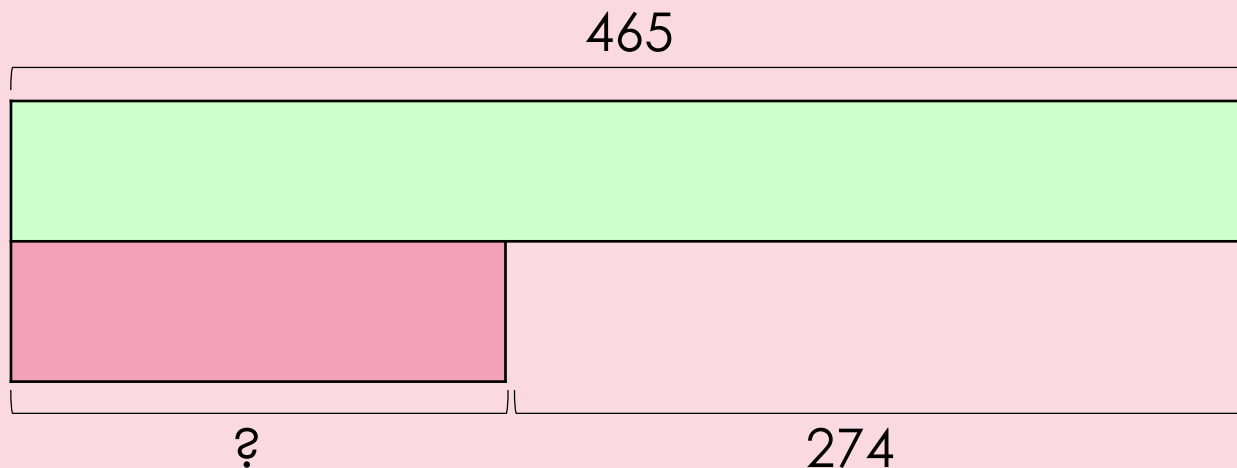


Identifying when subtractions will require regrouping from hundreds

The Great Hall at Edinburgh Castle can hold 465 people.

The Jacobite Room holds 274 fewer guests.

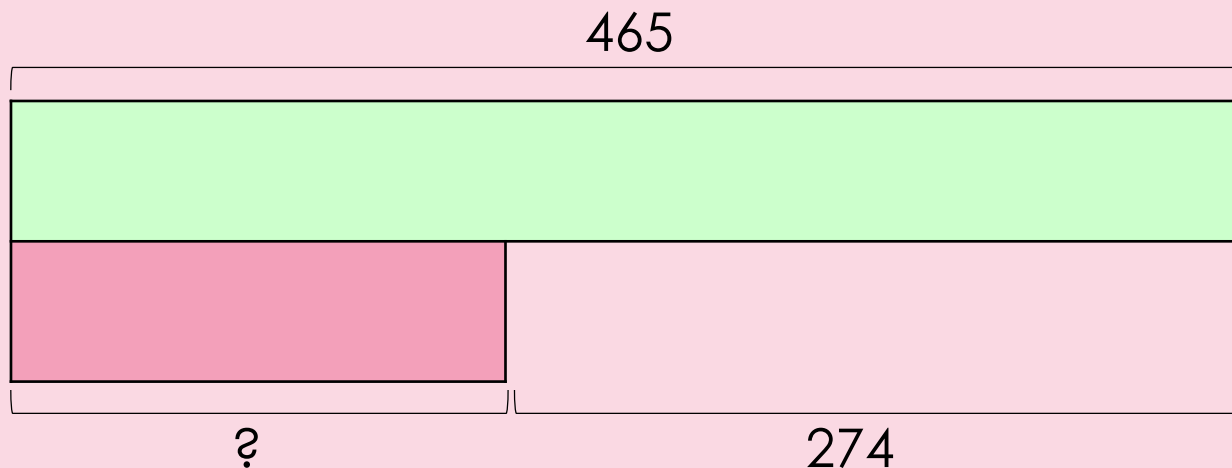
How many people can the Jacobite Room hold?



Identifying when subtractions will require regrouping from hundreds

Does this calculation need regrouping?
If so, in which columns?

$$\boxed{465} - \boxed{274} = \boxed{}$$



Identifying when subtracting 3-digit numbers requires regrouping from hundreds to tens

Choose a calculation.

$$823 - 361$$

$$245 - 123$$

$$614 - 232$$

$$256 - 232$$

$$439 - 167$$

$$748 - 236$$

$$727 - 136$$

$$376 - 223$$

$$327 - 156$$

Represent the known value with Dienes.

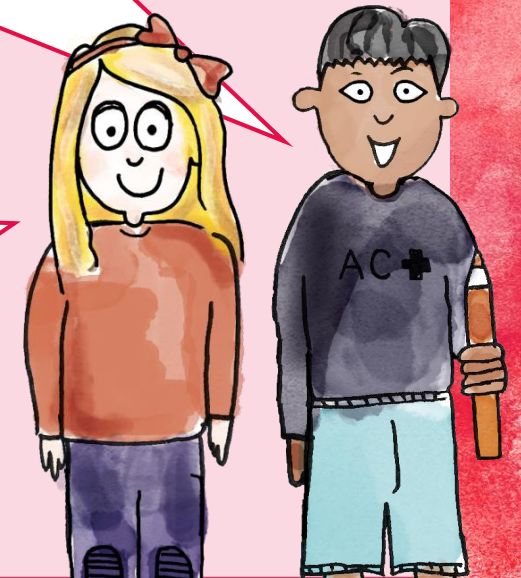


Identifying when subtracting 3-digit numbers requires regrouping from hundreds to tens

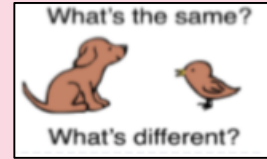
- Identify whether the calculation you chose needs regrouping.
- Explain how you know.
- Calculate the subtraction mentally.
- Then represent it with Dienes.

I think my calculation needs regrouping because the tens digit in the part is greater than the tens digit in the whole.

I am regrouping 1 hundred for 10 tens. Now there are 3 hundreds, 16 tens and 5 ones. I am using number bonds to 16 to subtract 8 tens from 16 tens. $16 - 8 = 8$, so there are 8 tens left.



Subtracting 3-digit numbers using column subtraction, with regrouping



$$244 - 126$$

$$356 - 143$$

$$465 - 274$$

What is the same? What is different?

How would you choose to solve each calculation?

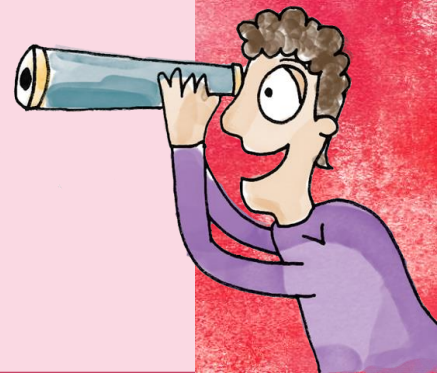
Why is that?

What would be a good estimate for

$$244 - 126 \quad ?$$

What would be a good estimate for

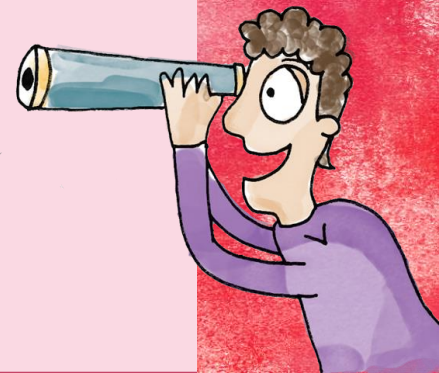
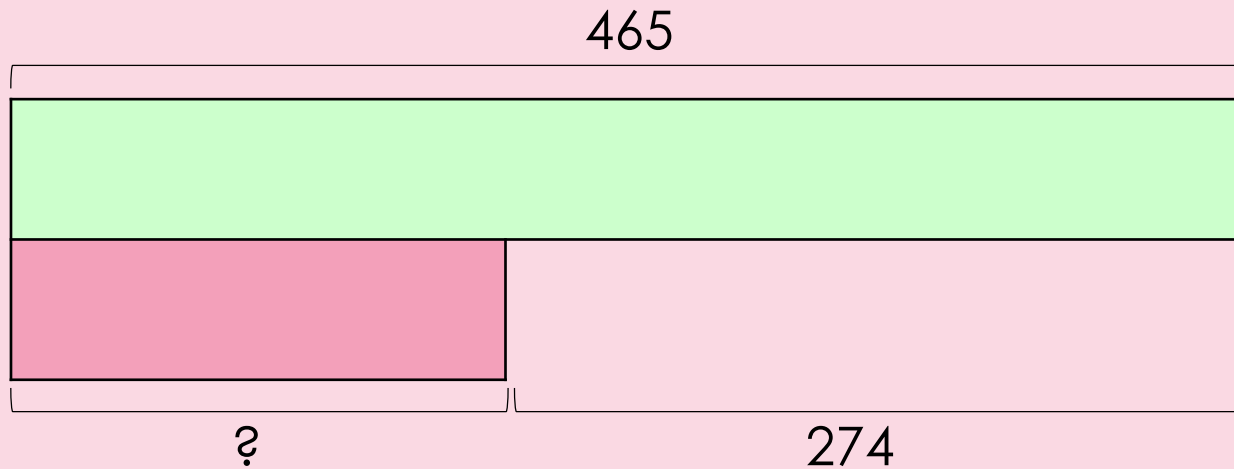
$$356 - 143 \quad ?$$



Subtracting 3-digit numbers using column subtraction, with regrouping

Estimate your answer before calculating it.

$$\boxed{465} - \boxed{274} = \boxed{}$$



Key learning: To subtract 3-digit numbers using column subtraction

Subtracting 3-digit numbers using column subtraction, with regrouping

- Choose a calculation and estimate its solution.
- Identify whether the calculation needs regrouping.
- If not, use a mental strategy to solve it and write the completed equation.
- If it does need regrouping, use column subtraction to calculate the total.
- Check your answer using your estimate.
- Be prepared to represent your other calculations with Dienes.

$$324 - 272$$

$$572 - 344$$

$$475 - 263$$

$$228 - 166$$

$$346 - 244$$

$$634 - 452$$



Identifying and explaining an error



- A student completed this calculation.
- Where has a mistake been made?
- How do you know?
- What inverse calculation could you use to check?
- What do you think the student did wrong?
- How would you correct the mistake?

$$\begin{array}{r} 423 \\ - 272 \\ \hline 251 \end{array}$$



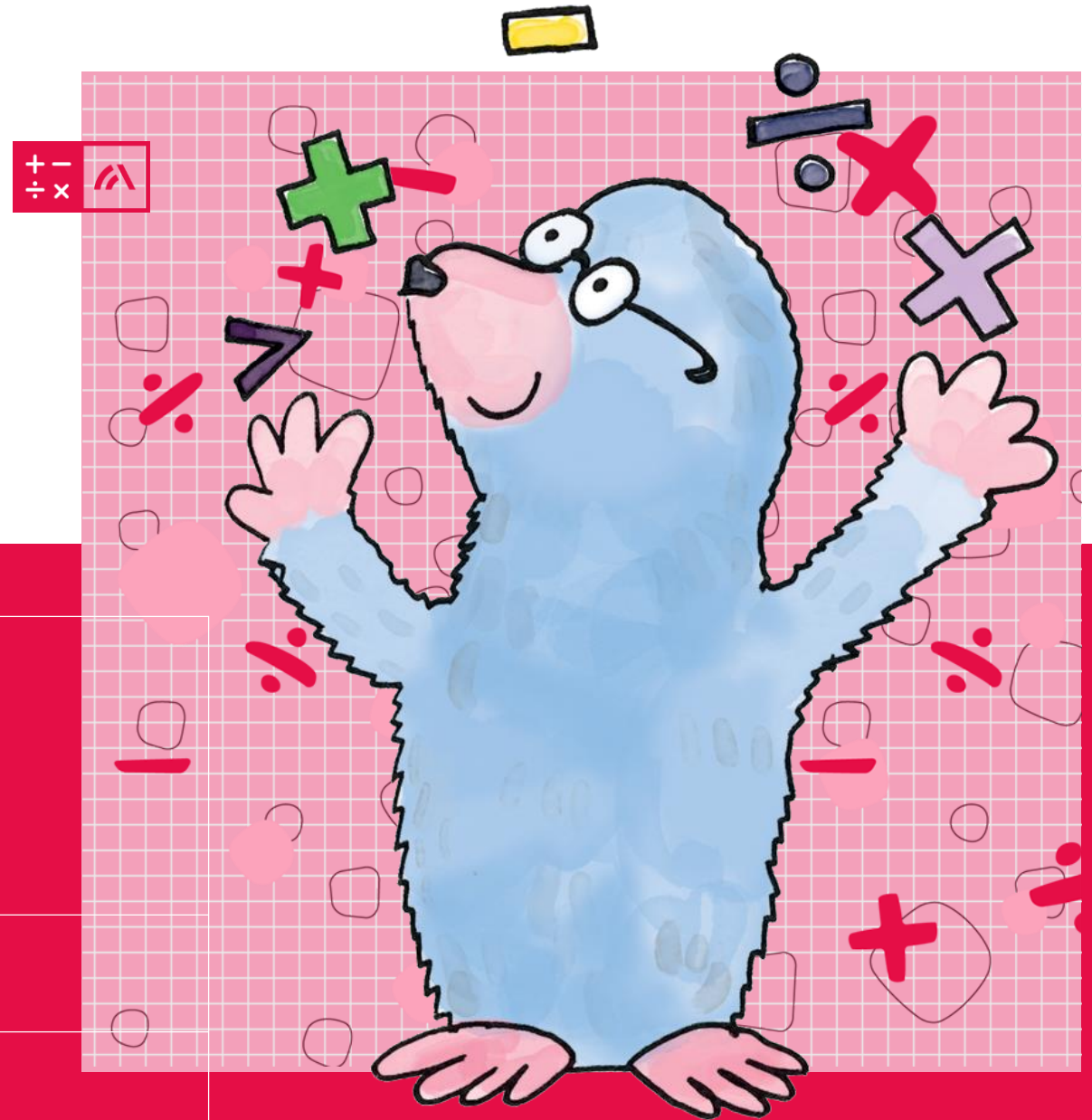
Plenary



Year 3 Unit 4: Addition and subtraction

Lesson 12: Subtracting 3-digit numbers, regrouping in multiple columns

Mathematics
Mastery



Practising subtraction with regrouping in one column

$$315 - 123$$

$$346 - 228$$

$$533 - 272$$

$$532 - 320$$

- Use column subtraction to calculate the subtractions that need regrouping.
- Can you spot the calculation that does not need regrouping?
- How would you solve it? Be ready to explain your answer.



Do Now



Key learning: To subtract 3-digit numbers using column subtraction



subtraction

minus



difference

inverse



regrouping



partition



Star Words



Subtraction with independent regrouping from hundreds and tens

$$634 - 481$$

$$582 - 246$$

$$464 - 186$$

Which subtraction do you think you would need to calculate most carefully?

Explain your answer clearly.

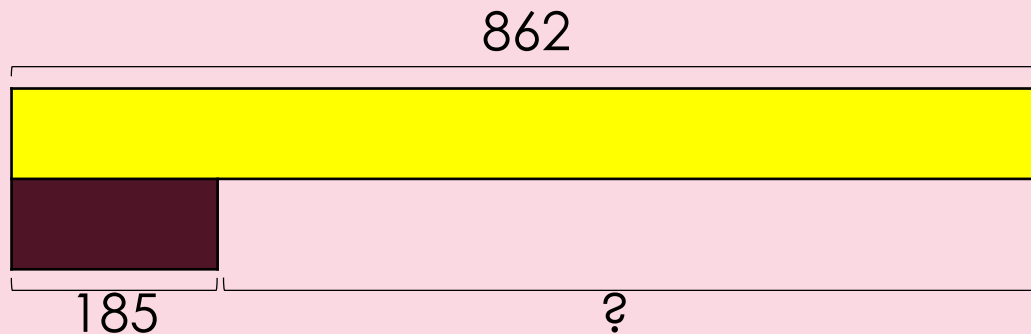


Subtraction with independent regrouping from hundreds and tens

At the Royal Edinburgh Military Tattoo, there were 862 drummers and 185 bagpipers.

How many more drummers than pipers were there?

What steps would you need to take to solve this problem?
Estimate the answer before calculating it.

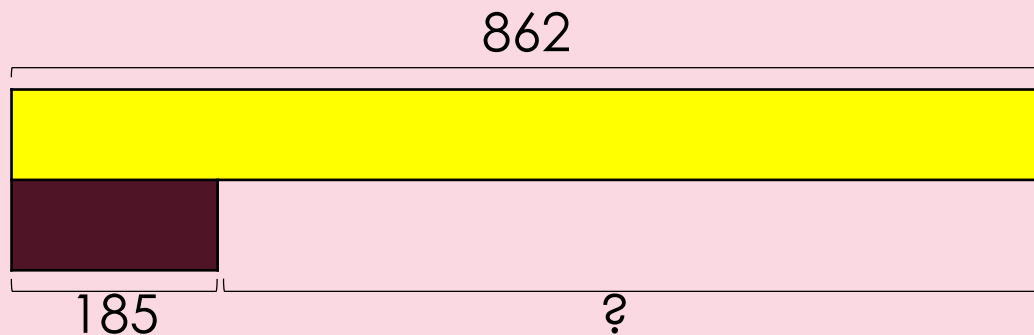


Subtraction with independent regrouping from hundreds and tens

At the Royal Edinburgh Military Tattoo, there were 862 drummers and 185 bagpipers.

How many more drummers than pipers were there?

What steps would you need to take to solve this problem?
Estimate the answer before calculating it.



862

-

185

=



Practising subtraction with regrouping of tens and hundreds

Choose a calculation.

$$272 - 143$$

$$541 - 227$$

$$362 - 245$$

$$326 - 164$$

$$437 - 252$$

$$548 - 272$$

$$322 - 165$$

$$523 - 246$$

$$434 - 276$$

Represent the whole using Dienes.



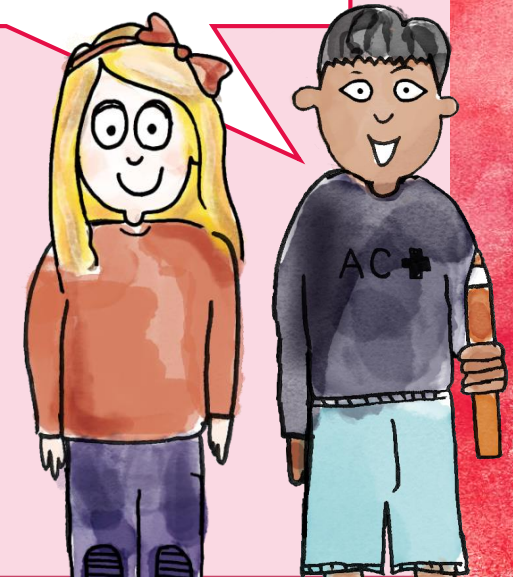
Talk Task

Identifying when subtracting 3-digit numbers requires regrouping from hundreds to tens

- Identify whether the calculation you chose needs regrouping.
- Explain how you know.
- Calculate the subtraction mentally.
- Then represent it with Dienes and record the steps using the column method.

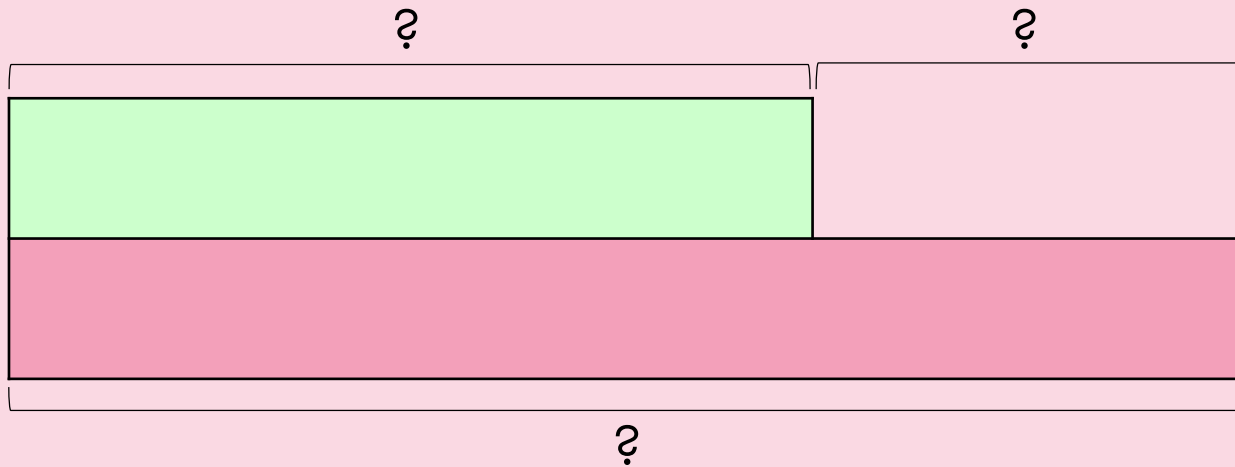
$527 - 379$ needs regrouping twice because both the ones and tens digits are greater in the part than in the whole.

I need to regroup 1 ten for 10 ones. That leaves 1 ten and gives 17 ones. I can use number bonds to 17, so I know $17 - 9 = 8$.

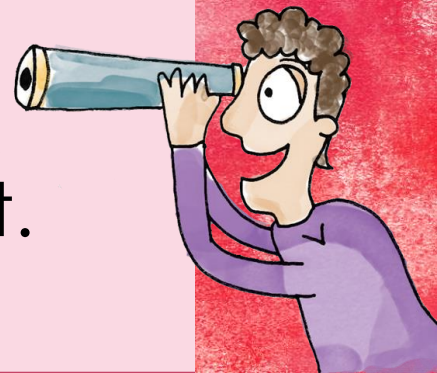


Practising subtraction requiring regrouping to regroup

In the Redcoat Café, 268 litres of cola was sold.
404 litres of lemonade was also sold.
How much less cola was sold than lemonade?



Estimate the answer to this problem before calculating it.



Key learning: To subtract 3-digit numbers using column subtraction

Subtracting 3-digit numbers using column subtraction, with regrouping in at least one column

Choose calculations that are appropriate to complete using column subtraction.

Your first four calculations must include:

- a) regrouping from tens to ones
- b) regrouping from hundreds to tens
- c) regrouping from hundreds and tens
- d) regrouping to regroup



Independent Task



Exploring efficient strategies

$$404 - 268 = \square$$

Is column subtraction the only strategy you could use to solve this calculation?

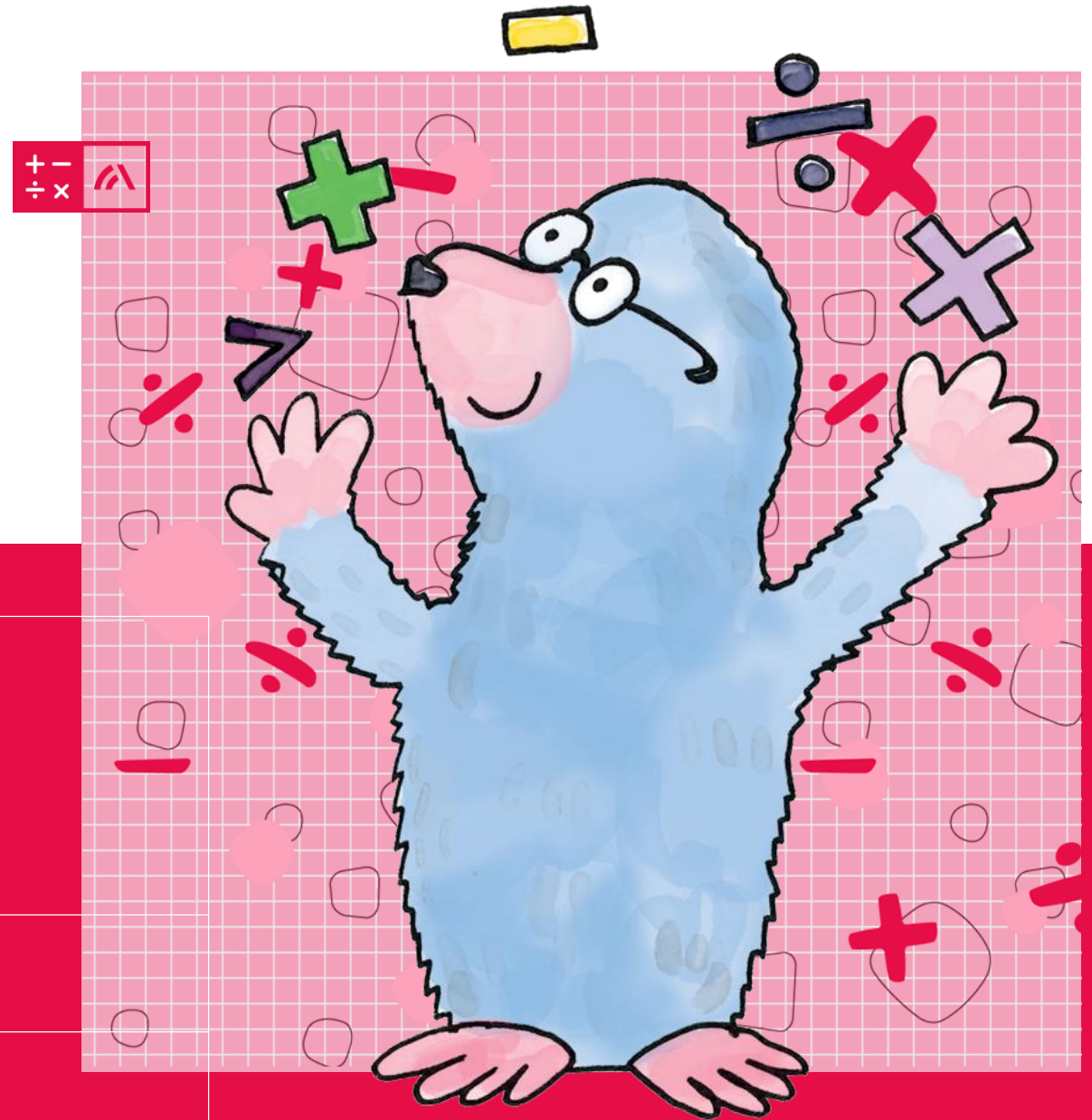
How else could you solve it?



Year 3 Unit 4: Addition and subtraction

Lesson 13: Addition and subtraction word problems

Mathematics
Mastery



Practising regrouping to regroup

$$203 - 126$$

$$806 - 204$$

$$503 - 246$$

$$403 - 327$$

- Use column subtraction to calculate the subtractions that need regrouping.
- Can you spot the calculation that does not need regrouping?
- How would you solve it? Be ready to explain your answer.



Do Now



Key learning: To solve word problems using addition and subtraction skills

bar model

known

unknown

value

whole

part

difference

quantity



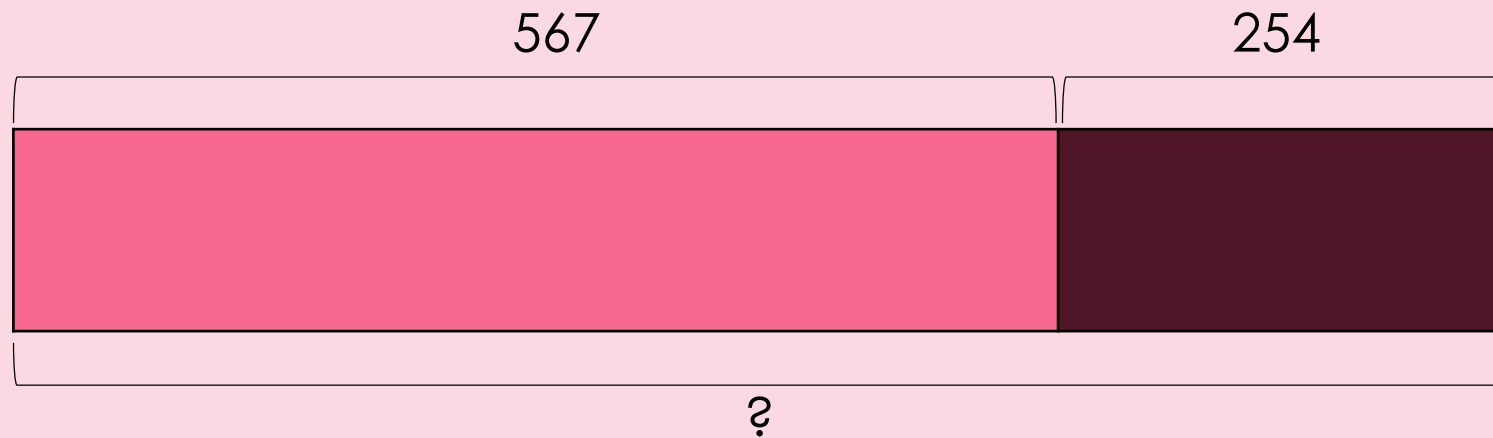
Star Words



Interpreting word problems

A one-hour traffic survey on the M8 motorway between Edinburgh and Glasgow counted 567 cars and 254 lorries.

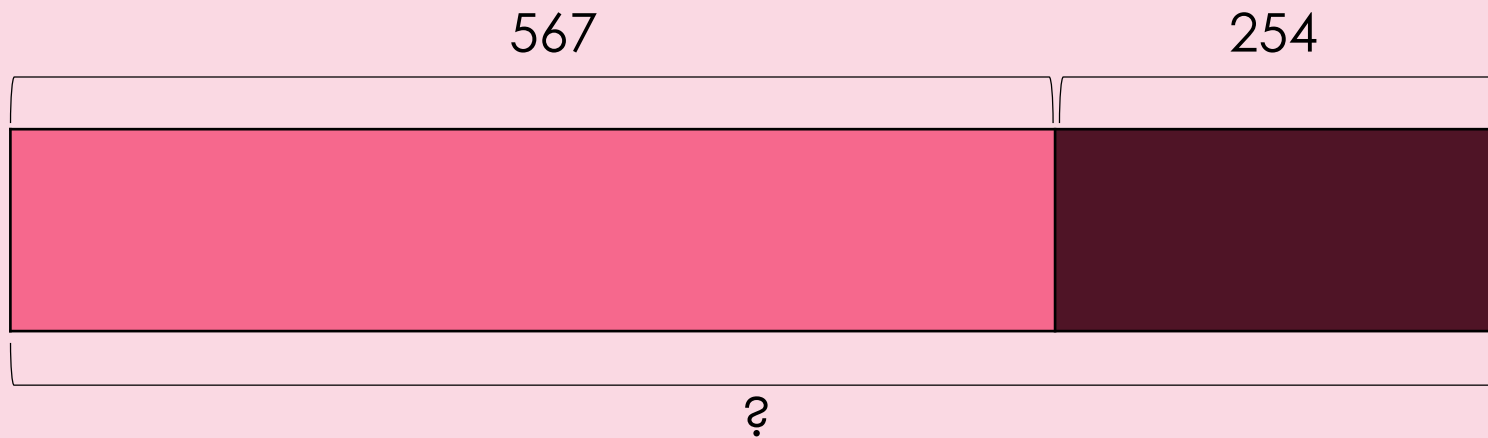
How many vehicles were counted altogether?



Interpreting word problems

$$567 + 254 = \boxed{}$$

Estimate the answer before you calculate it.

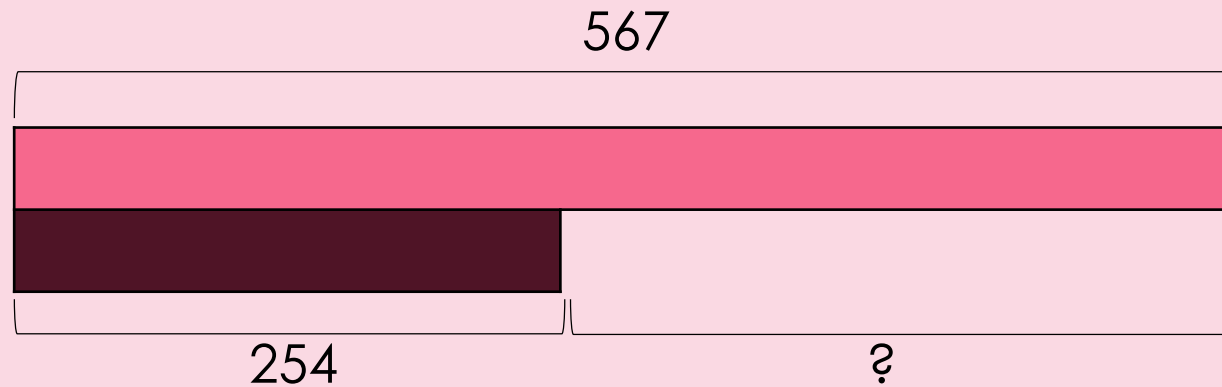


Interpreting word problems

A one-hour traffic survey on the M8 motorway between Edinburgh and Glasgow counted 567 cars and 254 lorries.

How many more cars than lorries were there?

How could you solve this calculation?



Interpreting word problems

A one-hour traffic survey on the M8 motorway between Edinburgh and Glasgow counted 567 cars and 254 lorries.

How many more cars than lorries were there?

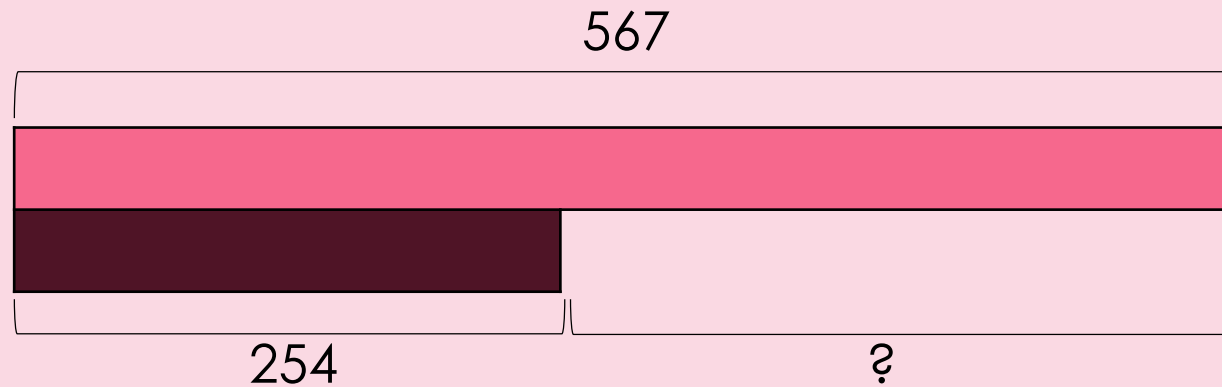
How could you solve this calculation?

567

-

254

=



Matching word problems to bar models

- Choose a word problem and read it to your partner.
- Find the bar model that matches the maths in the problem.
- Explain how you know this, by identifying what is known and what is unknown.
- Discuss what calculation will solve the problem – but don't solve it yet.



We know the value of _____ and _____.
We don't know the value of _____.

I think I've identified which bar model
matches the problem, because ...

I think we need to calculate ...

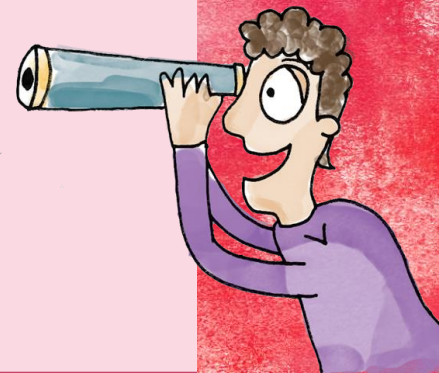
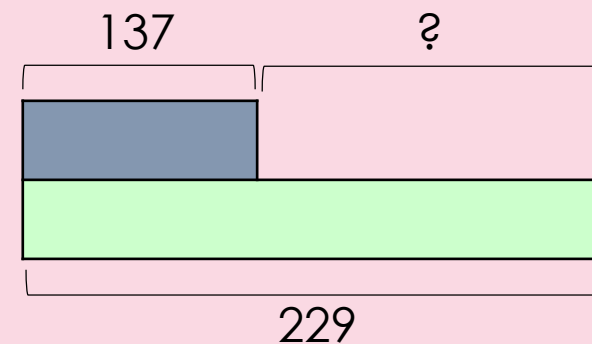
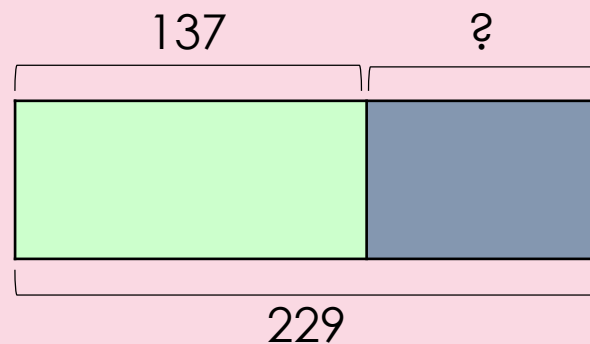
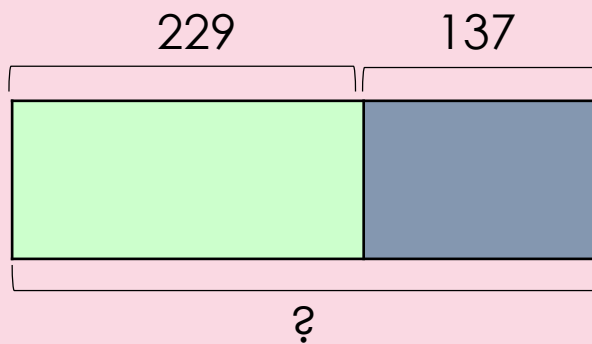


Solving problems with unknowns in 'non-standard' positions

Abdi's family used 137 litres of petrol to drive to Edinburgh and back.

They used a different quantity of petrol to drive to France and back for a camping holiday.

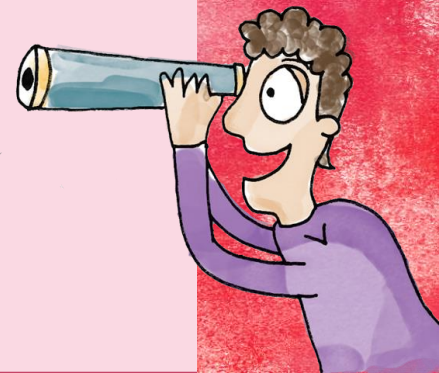
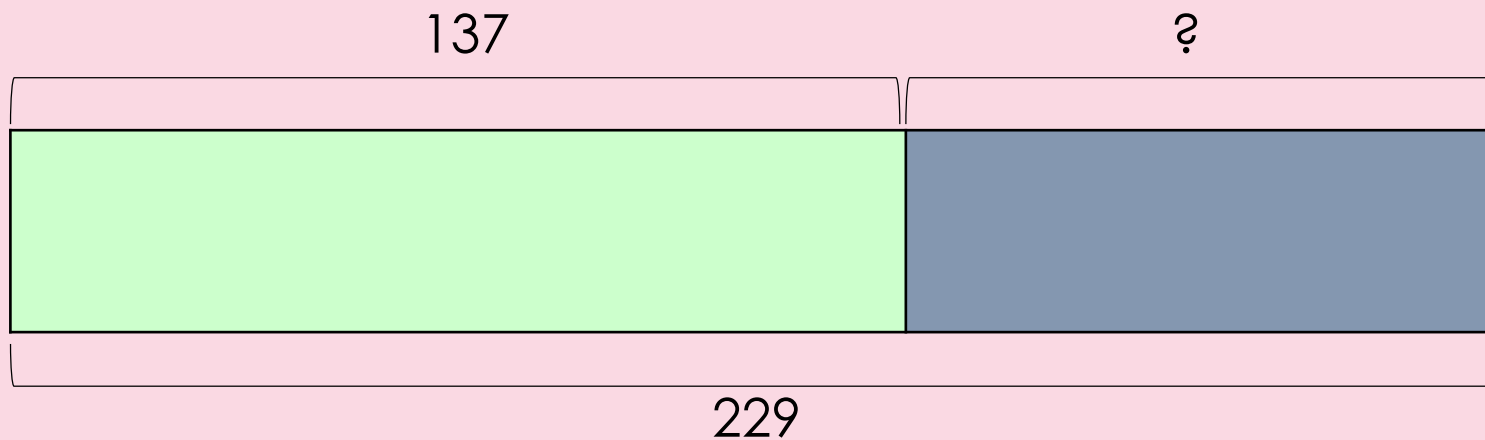
If they used 229 litres altogether, how much petrol did they use on their camping holiday?



Solving problems with unknowns in 'non-standard' positions

$$229 - 137 = \square$$

Estimate the answer before you calculate it.



Key learning: To solve word problems using addition and subtraction skills

Bar modelling word problems

- Choose a word problem and read it carefully.
- Use Cuisenaire rods, or draw a bar model, to show the known and unknown values in the problem.
- Use the bar model to identify the relationships between the values and work out what calculation is needed.
- Choose an appropriate strategy and solve the calculation.
- Write the answer to the problem in a sentence.



Checking using the inverse

How could you check that your answer is exactly right?



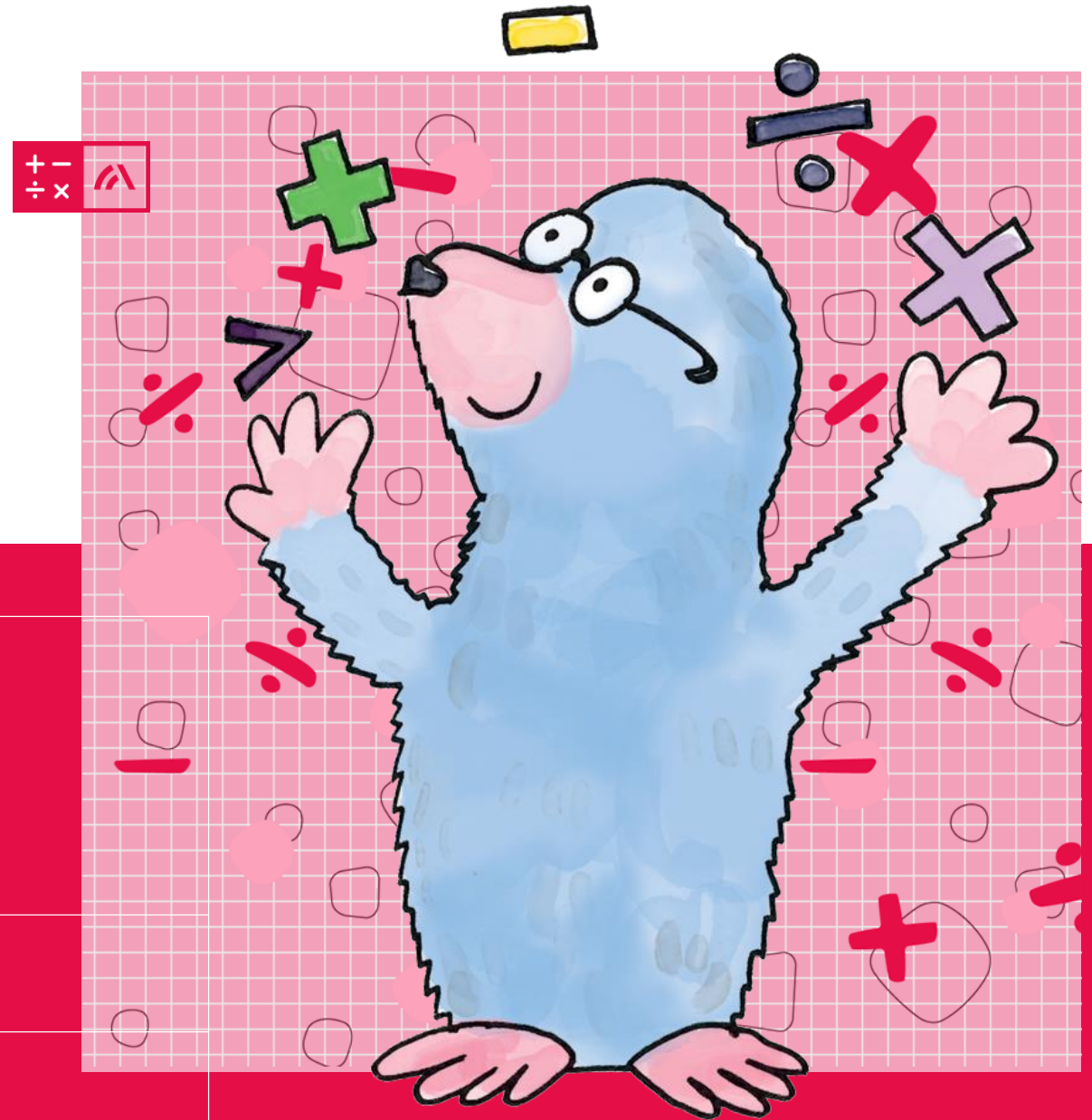
Plenary



Year 3 Unit 4: Addition and subtraction

Lesson 14: Word problems with tricky unknown values

Mathematics
Mastery



Estimating numbers on a number line

Place the following numbers on each number line.
Make sure you check what numbers are represented on each line.

50

600

710



Do Now



Key learning: To interpret and represent addition and subtraction problems with bar models



known

unknown



quantity



value

difference



part



whole



Star Words



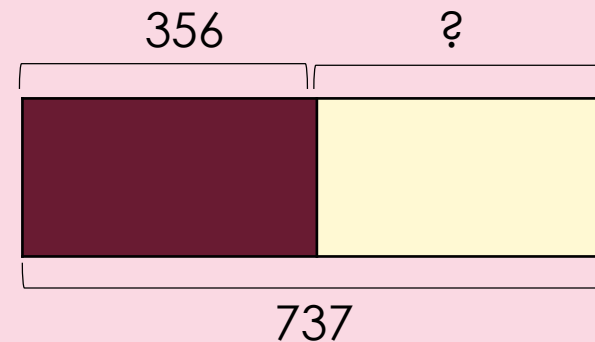
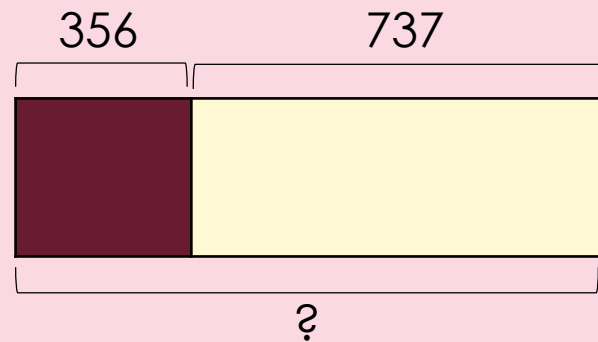
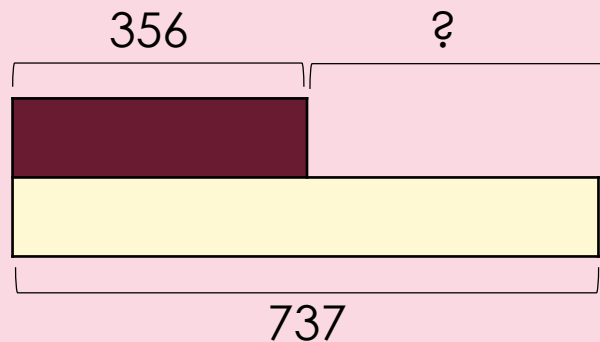
Interpreting tricky addition and subtraction problems



For most of the year, Edinburgh has 356 official tourist sites.

This increases greatly during the Edinburgh Festival in August, when a total of 737 are listed.

How many more tourist sites does the festival create?



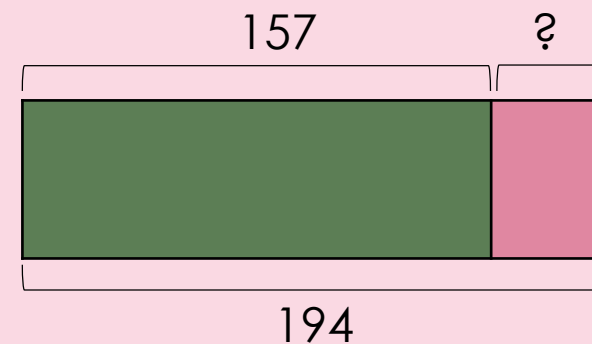
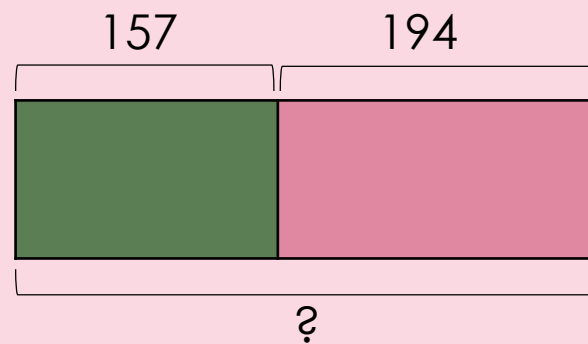
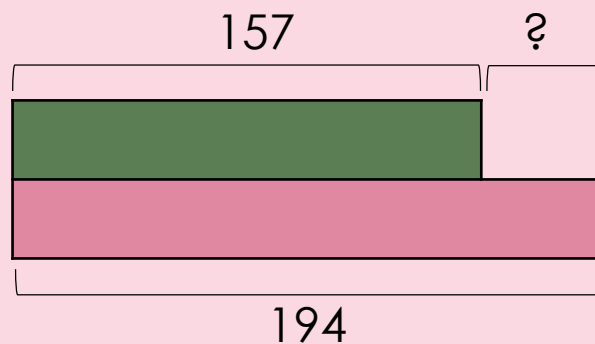
Interpreting tricky addition and subtraction problems

Elly sorted all the photos from her trip to Edinburgh into two folders.

In the 'People' folder, she had 157 photos.

In the 'Sights' folder, she had 194 photos.

How many photos did she take?



Identifying bar models for problems with tricky unknowns

- Choose a word problem and read it carefully.
- Identify the known and unknown values.
- Use this information to explain which bar model is correct.
- Explain what calculation you will need to solve the problem – but don't solve it yet.



We know the value of _____ and _____.
We don't know the value of _____.

We are looking a bar model with ...

The correct calculation is ...



Solving comparison problems with tricky unknowns

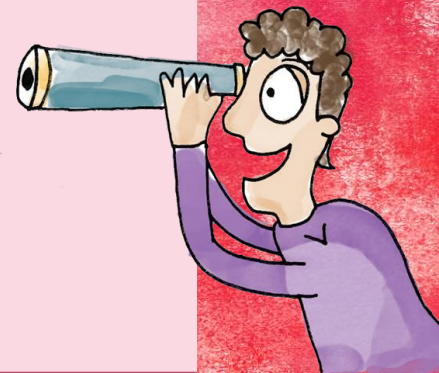


256 more children visited Edinburgh Castle in March than in February.

The number of children visiting in March was 486.

How many visited in February?

- What is known? What is unknown?
- What do you need to find out?
- How could you represent the problem on a bar model?
- What calculation is needed in order for you to find the unknown value?
- Did the problem sound like a subtraction? Why is that?



Solving comparison problems with tricky unknowns

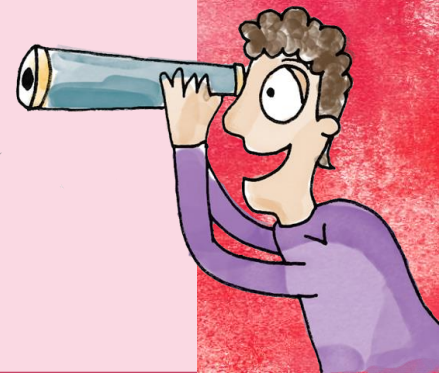
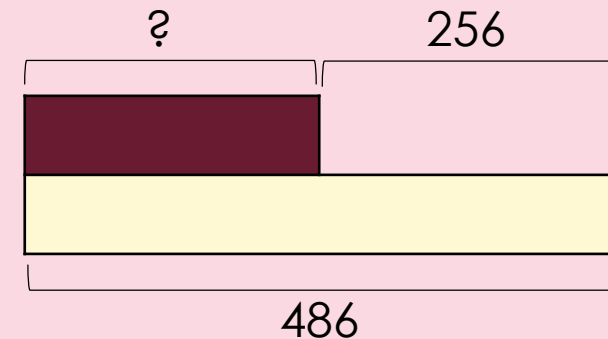


256 more children visited Edinburgh Castle in March than in February.

The number of children visiting in March was 486.

How many visited in February?

- What is known? What is unknown?
- What do you need to find out?
- How could you represent the problem on a bar model?
- What calculation is needed in order for you to find the unknown value?
- Did the problem sound like a subtraction? Why is that?



Solving comparison problems with tricky unknowns

237 more children visited Edinburgh Castle in April than in March.

We know number of children visiting in March was 486.
How many visited in April?

- What is known? What is unknown?
- What do you need to find out?
- How could you represent the problem on a bar model?



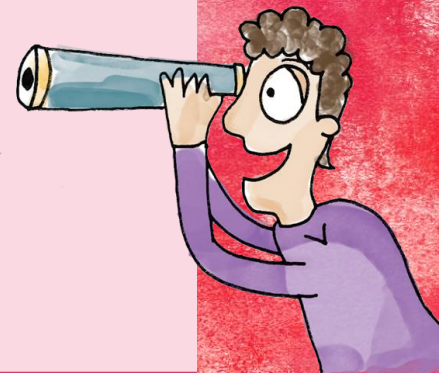
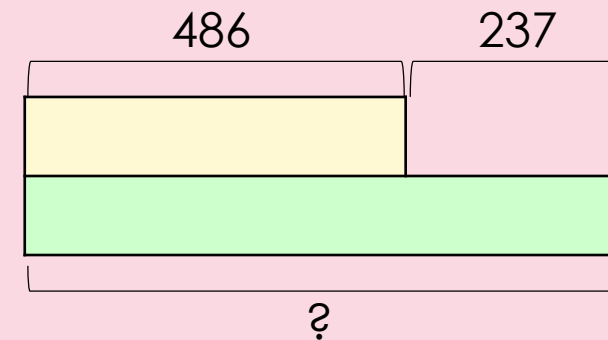
Solving comparison problems with tricky unknowns



237 more children visited Edinburgh Castle in April than in March.

We know number of children visiting in March was 486.
How many visited in April?

- What is known? What is unknown?
- What do you need to find out?
- How could you represent the problem on a bar model?



Key learning: To interpret and represent addition and subtraction problems with bar models

Solving problems, including those with tricky unknowns

- Read the problem carefully.
- Identify the known and unknown values.
- Create a bar model to represent the problem.
- Identify the calculation needed to solve it.
- If necessary, estimate the solution.
- Choose an efficient strategy to solve the calculation.
- Write the answer to the problem in a sentence.



Reflecting on learning

- What have you learned about solving problems?
- What new skills have you learned for adding and subtracting?
- What skills have you improved?
- What helped you to improve?

