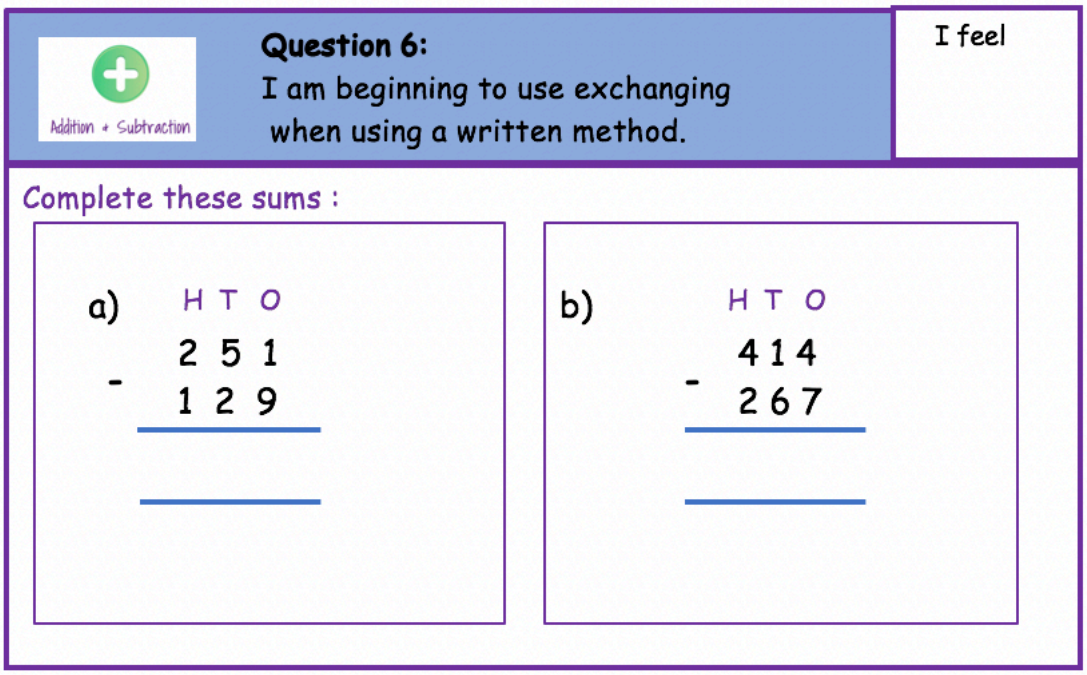
Subtraction Prior Learning Assessment Question 6:

LO: I can use a written method to subtract two amounts (involving exchanging)

NC NAS1: add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate

Teacher Input Ideas:

Prior Learning:



Starter ideas: partitioning numbers in different ways

For example:

345

300 and 40 and 5

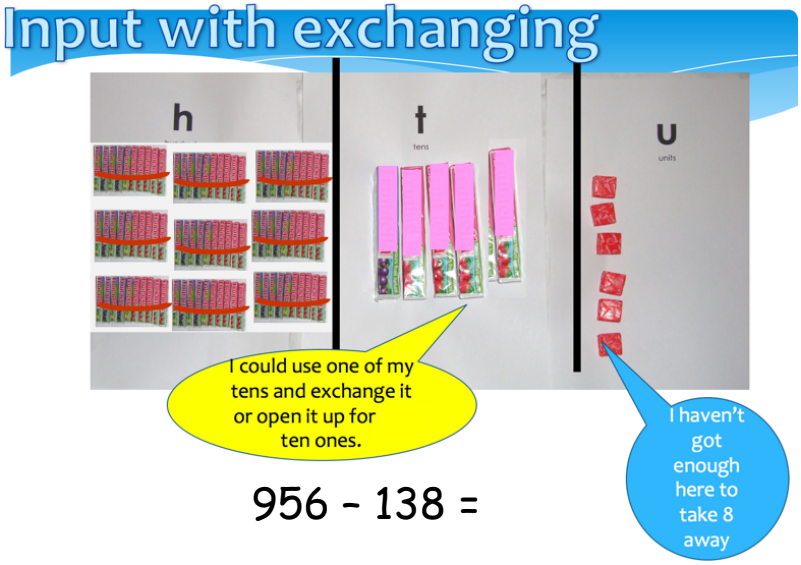
200 and 140 and 5

300 and 30 and 15.

Input for exchanging (decomposition method)

Use a large place value chart and sweets organised into sticks of ten , ones and ten sticks of ten as a packet of hundred sweets. Practical modelling will help the children to understand why exchanging is needed and when. Sweets work well as packets of hundred sweets and sticks of ten sweets can be opened and moved columns. Model exchanging and why it is necessary. Encourage children to help you to explain ensuring that the children are using accurate vocabulary.

For example



I can see that I have 6 sweets. I want to give away/ take away 8. I haven't got enough here to do this, but I have more sweets in my packets of ten so I will have to open /exchange a pack of ten. I now have ten ones and my 6 ones so I now can take 8 sweets away from the 16 sweets.

I now have 4 sticks of ten sweets. I want to take away 3 of these. I have one left over. I have 9 packets of hundred sweets. I can take away 1 hundred. I have 8hundred left.

This is how I can record on paper what I am doing:

$$\begin{array}{r} {\scriptstyle 4\ \ 1} \\ 9\,5\!\!\not{6} \\ -\ 1\,3\,8 \\ \hline 8\,1\,8 \end{array}$$

I have 6 sweets, they are my ones. I want to give away/ take away 8. I haven't got enough here to do this, but I can exchange a pack of ten. I will then have ten ones and my 6 ones so I now can take 8 from the 16.

I have opened/exchanged one of my tens so I now have 4 lots of ten left . I want to take 3 tens away from this and I will have I pack of ten left.

9 lots of hundred take away 1 lots of hundred sweets equals 8 lots of hundred sweets left.

If some children are finding this difficult to understand they should use the purple activity to practically explore exchanging with 3 digit amounts. The children should be given objects that can be physically opened or ungrouped from a group of ten. For year 4, base ten may still be very abstract as the tens and hundreds cannot be separated for exchanging. Sweets organised in to sticks of ten and packs of hundred work really well as the children can open a pack of 100 to reveal ten sticks of ten and a stick of ten sweets to reveal ten individual sweets.

Once the children understand this visually using practical equipment and can explain how tens and hundreds are exchanged for ones and tens, encourage the children to record this using the subtraction column method.

Repeat with other amounts such as 233 – 141 and 209- 145.

Practice Activities

Purple Practice: Most suited for children who will benefit from exploring exchanging practically.

This is a practical activity using the purple resource sheets 1, 2 and 3 (2 and 3 can be replaced with sweets or objects grouped).

Resource 1 is a blank place value chart. Some children may find it beneficial to start with exchanging only 2 digits first, looking at how the tens can be exchanged into ones. Practically explore subtracting amounts from each column. Discuss what happens when we haven't got enough in that column to take the amount we want away. Encourage the children to suggest using some from the next column and exchanging these into ones. The children could cut these up/ open sweets to see how this works. Now can we take the amount away?

Suggested sums:

74- 59 82 – 18 91- 67 54-46 85- 61 (no exchanging needed, see if the children notice)

You may also want to discuss here that these sums can be performed mentally by counting on or back. Inform the children that these numbers have been selected to introduce the children to exchanging and that a mental method may be more beneficial as the children gain confidence.

Once children show confidence, then encourage the children to calculate the answers using the resources and grid for 3 digit amounts looking at when hundreds need to be exchanged into tens and as they progress when both hundreds and tens required to be exchanged.

Suggested sums:	256- 170	317 – 18	402 – 310	587 – 290
	215- 157	450 – 284	578- 190	706- 320

Green Practice: Most suited for children who made errors in Question 6 of the prior learning assessment and will benefit from securing the use of the formal subtraction method including exchanging.

Children are presented with 9 sums laid out ready to use the written formal subtraction method. These questions require the children to exchange tens and hundreds to help to work out the answer.

For a further challenge, you can ask the children to decide if any of the sums can be worked out mentally. Which method would they use?

<u>Yellow Practice</u>: Most suited for children who demonstrate a good understanding of using the formal method and are ready to exchange with amounts containing zero.

The children are provided with nine sums that require them to exchange. As the questions progress , the children are to subtract from a zero or exchange from the next column that contains a zero. The children are to explore how to exchange a hundred into tens and then into ones in order to subtract the amount they have been asked to. Children may find this difficult to understand, therefore resources suggested in the purple activity may also be beneficial as the children can explore exchanging amounts into tens first and then into ones, exploring what happens at each step.

Mastery : Reasoning

The children are presented with a sum and 3 attempts at calculating the answer using the column method. The children are to look at each way the sum has been worked out and decide if the calculations are accurate and where they feel errors have been made. Encourage the children to explain what the errors are and how they know this. The children should prove they are right by modelling use of the column method accurately. The children should be able to explain the steps they are going through and identify that Safa was accurate in her working out

<u>Answers</u>

Green:

1) 238	2) 303	3) 117
4) 238	5) 73	6)161
7) 278	8) 147	9)257

Yellow :

1) 233	2) 31	3) 253
4) 136	5) 56	6)217
7) 47	8) 166	9)111

Mastery:

Safa is correct, because she has exchanged one of the 6 hundreds in to tens. Once these have been exchanged then one of the tens can be exchanged into ones, this now means that 9 can be taken away from the 2 as now it is 12. Then she has 9 tens left so now 5 can be taken away from 9. We have 5 hundreds left and now 3 hundred can be subtracted.

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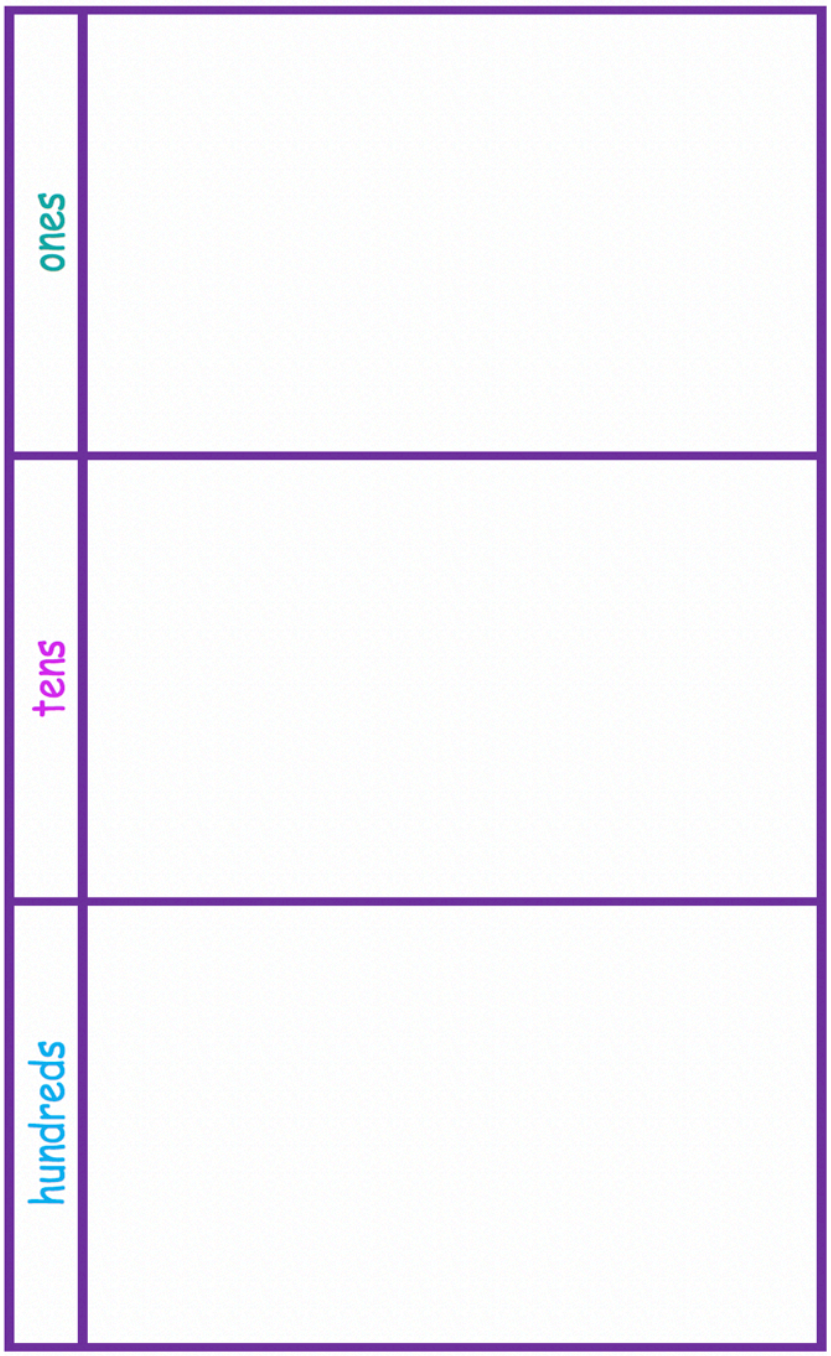
Purple Practice

Practical resource



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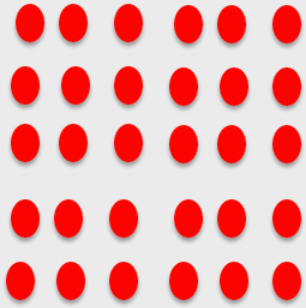
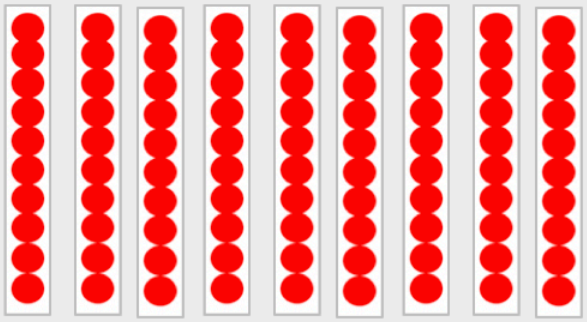
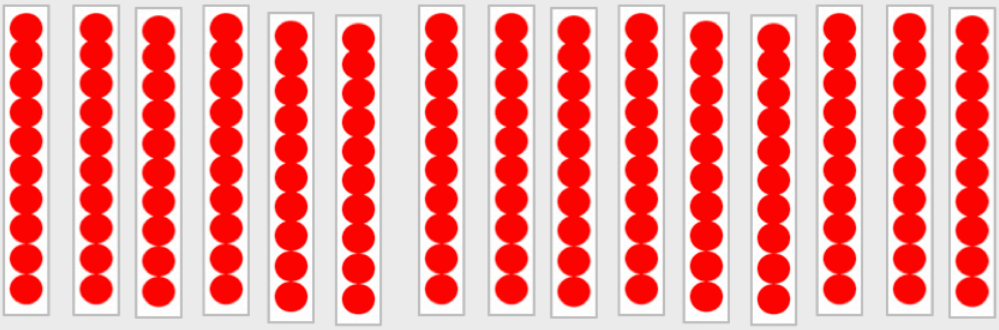
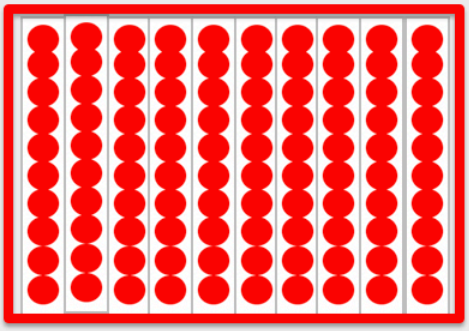
Purple Practice

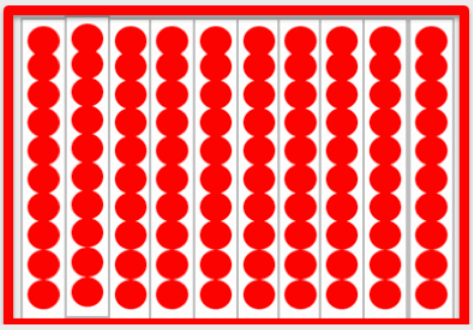
Practical resource

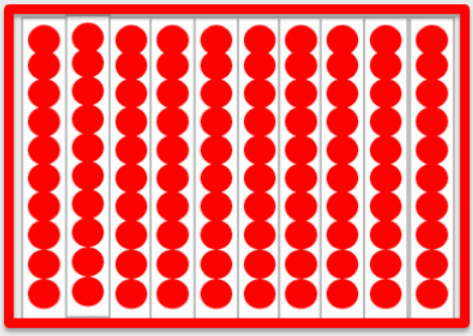


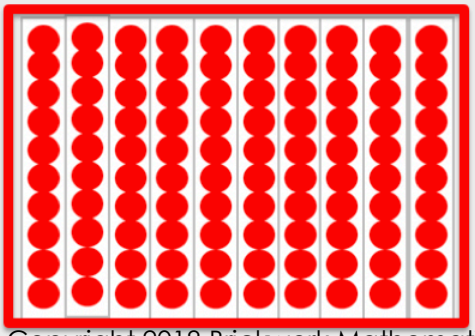












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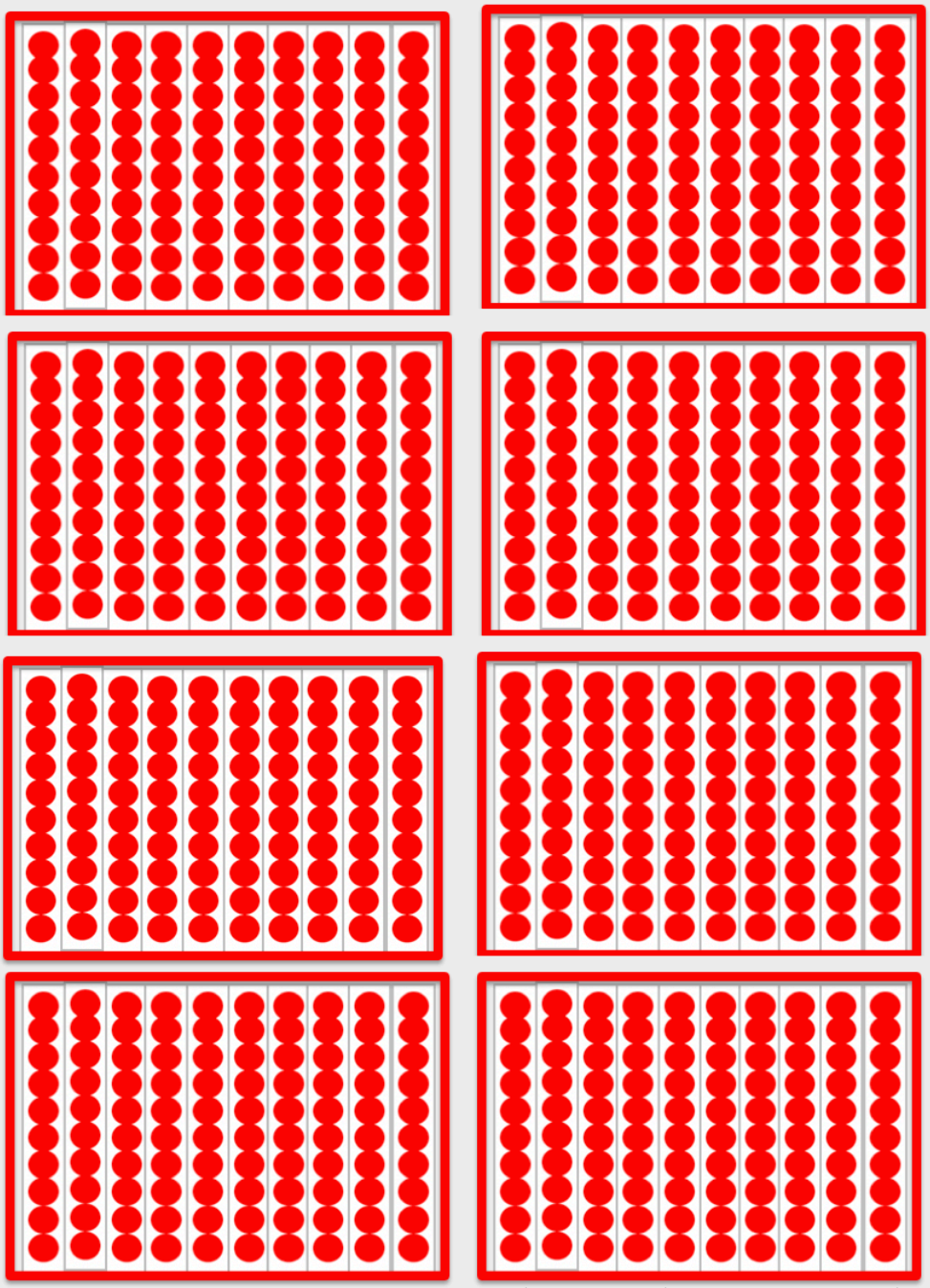
Purple Practice

Practical resource



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Green Activity

LO: I can use a formal written method to subtract (including exchanging).

Use the column method to subtract these amounts.

1)

$$\begin{array}{r} 456 \\ -\ 218 \\ \hline \\ \hline \end{array}$$

2)

$$\begin{array}{r} 351 \\ -\ \ 48 \\ \hline \\ \hline \end{array}$$

3)

$$\begin{array}{r} 274 \\ -\ 157 \\ \hline \\ \hline \end{array}$$

4)

$$\begin{array}{r} 528 \\ -\ 290 \\ \hline \\ \hline \end{array}$$

5)

$$\begin{array}{r} 616 \\ -\ 543 \\ \hline \\ \hline \end{array}$$

6)

$$\begin{array}{r} 304 \\ -\ 143 \\ \hline \\ \hline \end{array}$$

7)

$$\begin{array}{r} 526 \\ -\ 248 \\ \hline \\ \hline \end{array}$$

8)

$$\begin{array}{r} 246 \\ -\ \ 99 \\ \hline \\ \hline \end{array}$$

9)

$$\begin{array}{r} 742 \\ -\ 485 \\ \hline \\ \hline \end{array}$$

Challenge : which of these questions can be worked out mentally quickly and efficiently?

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Yellow Activity

LO: I can use a formal written method to subtract (including exchanging).

Use the column method to subtract these amounts.

1)

$$\begin{array}{r} 450 \\ -\ 217 \\ \hline \\ \hline \end{array}$$

2)

$$\begin{array}{r} 103 \\ -\ \ 72 \\ \hline \\ \hline \end{array}$$

3)

$$\begin{array}{r} 509 \\ -\ 256 \\ \hline \\ \hline \end{array}$$

4)

$$\begin{array}{r} 303 \\ -\ 167 \\ \hline \\ \hline \end{array}$$

5)

$$\begin{array}{r} 102 \\ -\ \ 46 \\ \hline \\ \hline \end{array}$$

6)

$$\begin{array}{r} 610 \\ -\ 393 \\ \hline \\ \hline \end{array}$$

7)

$$\begin{array}{r} 100 \\ -\ \ 53 \\ \hline \\ \hline \end{array}$$

8)

$$\begin{array}{r} 300 \\ -\ 134 \\ \hline \\ \hline \end{array}$$

9)

$$\begin{array}{r} 600 \\ -\ 489 \\ \hline \\ \hline \end{array}$$

Challenge which of these questions can be worked out mentally quickly and efficiently?

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Mastery

Reasoning

Three children are given this sum to calculate:

$$602 - 359 =$$

Look at how each child has worked out the answer. Decide who is right and explain where the errors are and why.

Harry

$$\begin{array}{r} 602 \\ -\ 359 \\ \hline 357 \end{array}$$

Harry is

Zara is

$$\begin{array}{r} {\scriptstyle 5\ 1\ 1} \\ \cancel{6}\,\cancel{0}\,2 \\ -\ 359 \\ \hline 253 \end{array}$$

Zara

Safa

$$\begin{array}{r} {\scriptstyle 5\ 9\ 1} \\ \cancel{6}\,\cancel{0}\,\cancel{2} \\ -\ 359 \\ \hline 243 \end{array}$$

Safa is

Can you demonstrate how to work out the answer and explain each step you take?

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