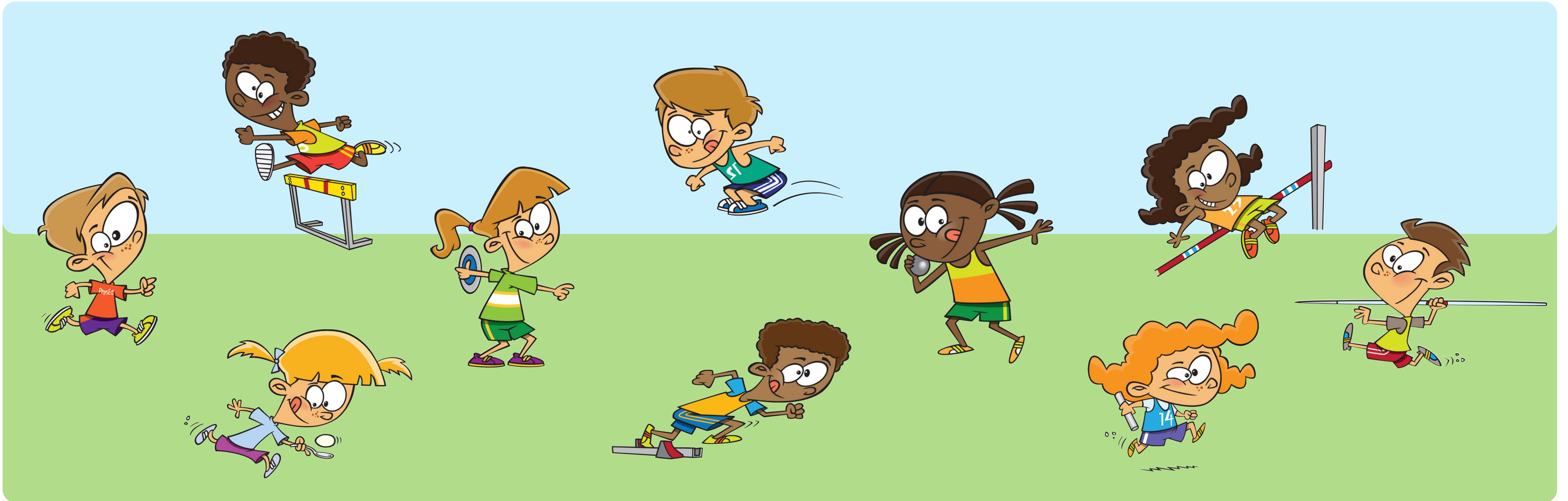


Using Addition and Subtraction 1



Learning Objective:

To use the formal method for subtraction, including exchanging more than once



My teacher has handed me back my work saying that they are all incorrect – can you help me figure out where I have gone wrong?

$$\begin{array}{r} 629 \\ - 438 \\ \hline 211 \end{array}$$

$$\begin{array}{r} 7\overset{1}{\cancel{2}}\overset{1}{4}3 \\ - 152 \\ \hline 7191 \end{array}$$

$$\begin{array}{r} 3547 \\ - 2532 \\ \hline 6079 \\ 1 \end{array}$$

Think, pair, then share your ideas.

Back

Next

Did you spot the error 1?

$$\begin{array}{r} 629 \\ - 438 \\ \hline 211 \end{array}$$

In the tens column,
the top digit was
taken away from
the bottom digit!



To solve correctly,
an exchange should
be made between
the hundreds and
tens column.

$$\begin{array}{r} \overset{5}{\cancel{6}}\overset{1}{2}9 \\ - 438 \\ \hline 191 \end{array}$$



I MUST remember to always take away the bottom number from the top! If I can't do this, then I have to exchange.

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Next

Did you spot the error 2?

$$\begin{array}{r} 7\cancel{2}^143 \\ - 152 \\ \hline 7191 \end{array}$$

In the hundreds column, the original value of the digit **before** the exchange was used in the calculation instead.



To solve correctly, the hundreds column calculation should have been $1 - 1 = 0$.

$$\begin{array}{r} 7\cancel{2}^143 \\ - 152 \\ \hline 7091 \end{array}$$



I MUST remember to subtract the correct numbers in each column calculation – if it has a cross through it, I should ignore it and use the number that is one less than it instead!

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Next

Did you spot the error 3?

$$\begin{array}{r} 3547 \\ -2532 \\ \hline 6079 \end{array}$$

These numbers have been added!

To solve correctly, the numbers need to be subtracted!

$$\begin{array}{r} 3547 \\ -2532 \\ \hline 1015 \end{array}$$

1



Oops! I must always look at the sign next to the column and make sure I am using the correct operation!

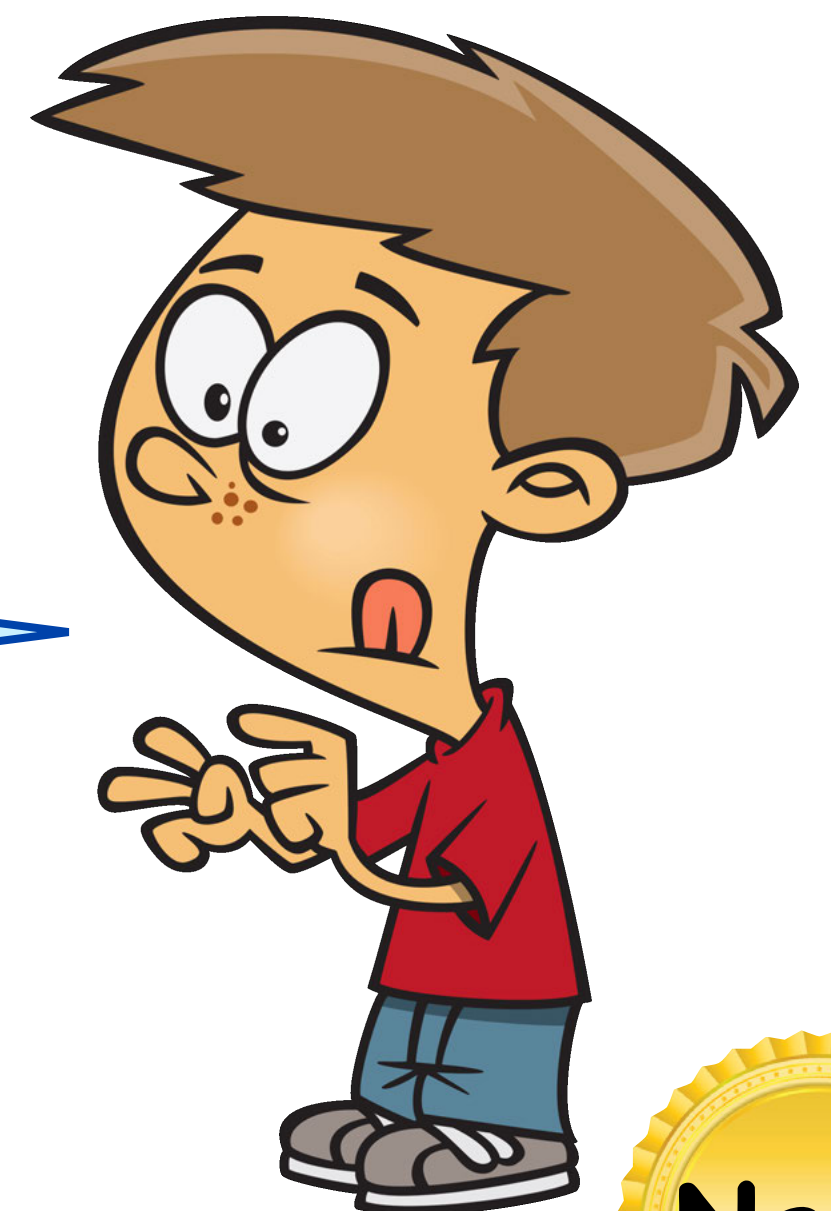
Back

Next

Now have a look at this column subtraction.
Talk through the steps you would take to solve it with a partner.

$$\begin{array}{r} 2136 \\ - 1528 \\ \hline \\ \hline \end{array}$$

What is different
about this column
subtraction to the
ones we have been
solving so far?



Back

Next

The answers to the ones and tens columns have been calculated correctly using exchanging.

$$\begin{array}{r} 21\overset{2}{\cancel{3}}\overset{1}{6} \\ - 1528 \\ \hline 08 \end{array}$$



What do you think we need to do next to be able to calculate the subtraction for the hundreds column?

Think, pair then share your ideas.

Back

Next

We need to **exchange** again! This time, we are exchanging **one thousand** for **ten hundreds**.

$$\begin{array}{r} \overset{1}{\cancel{2}} \overset{2}{1} \overset{1}{\cancel{3}} 6 \\ - 1528 \\ \hline 08 \end{array}$$

We put a cross through the thousands number that we are exchanging with, and write one less than that number next to it, as we have taken one 'thousand'.

In this case, two thousands have been turned into one thousand.

Back

Next

$$\begin{array}{r}
 \overset{1}{\cancel{2}} \overset{1}{1} \overset{2}{\cancel{3}} \overset{1}{6} \\
 - 1528 \\
 \hline
 08
 \end{array}$$

We then put the one 'thousand' (or ten 'hundreds') we have exchanged next to the number in the hundreds column. In this case it is one. This means we now have 11 hundreds in the hundreds column.

We can now subtract five from eleven.

Can you complete the calculation?



Back

Next

$$\begin{array}{r}
 \overset{1}{\cancel{2}} \overset{1}{1} \overset{2}{\cancel{3}} \overset{1}{6} \\
 - 1528 \\
 \hline
 608
 \end{array}$$

Did you solve it
correctly?

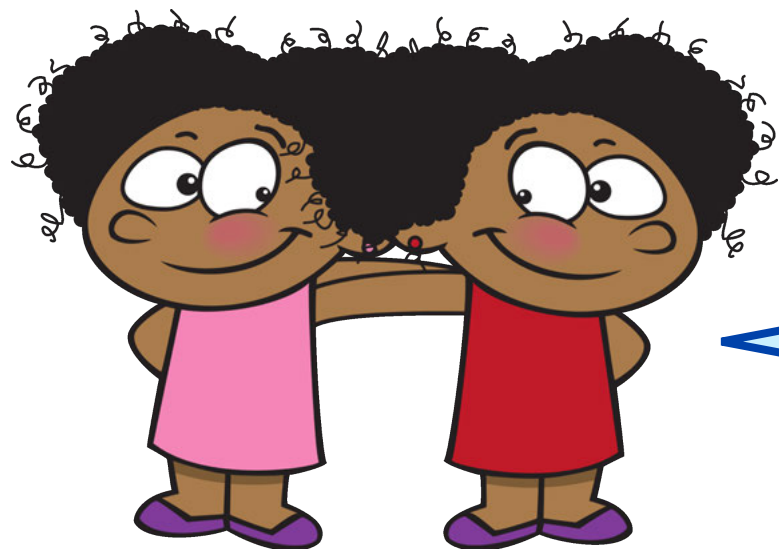
Great work!

Now let's see if you can
solve some more on
your own...



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Next

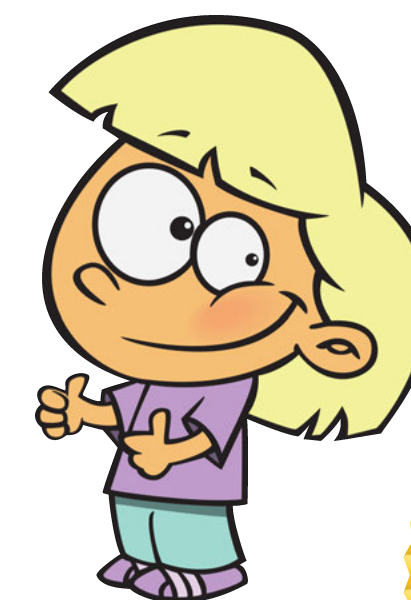


Choose one of these column subtractions, and solve it with a partner. Explain each step clearly.

$$\begin{array}{r} 4325 \\ - 1719 \\ \hline \\ \hline \end{array}$$

$$\begin{array}{r} 8752 \\ - 6823 \\ \hline \\ \hline \end{array}$$

Now solve the other column subtraction by yourself!



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Next

Did you complete all of the exchanges correctly?

$$\begin{array}{r} \overset{3}{\cancel{4}} \overset{1}{3} \overset{1}{\cancel{2}} \overset{1}{5} \\ - 1719 \\ \hline 2606 \end{array}$$

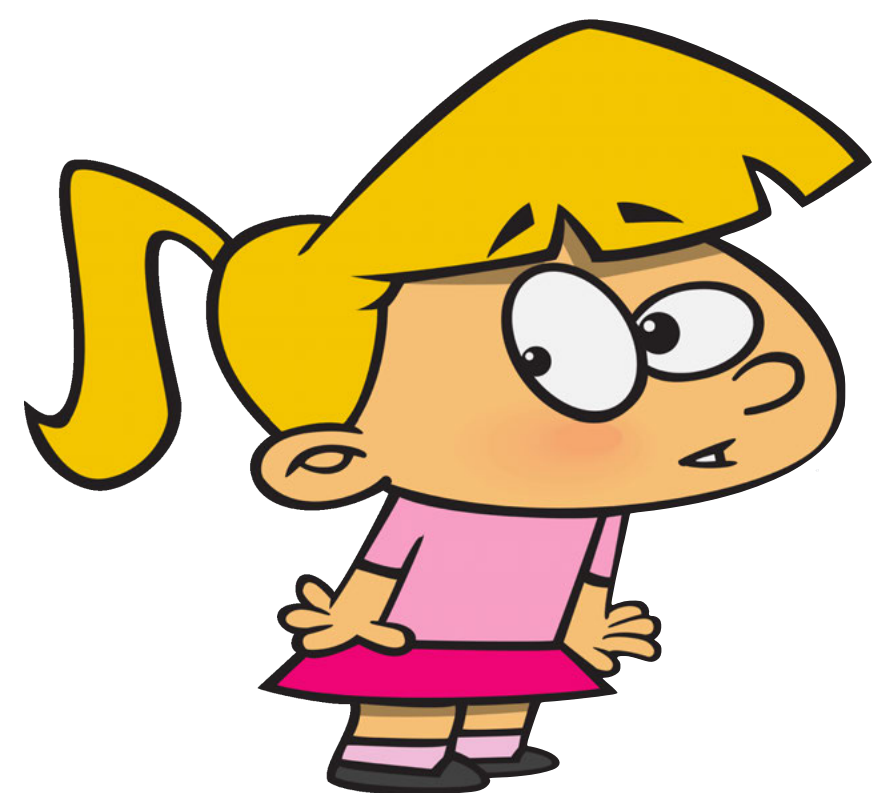
$$\begin{array}{r} \overset{7}{\cancel{8}} \overset{1}{7} \overset{4}{\cancel{5}} \overset{1}{2} \\ - 6823 \\ \hline 1929 \end{array}$$



How confident do you feel about solving column subtractions like these so far?

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Next



Can you help me?
I'm a bit stuck...

I've exchanged so that I can
calculate the tens column, but
now I'm trying to work out
the hundreds column – what do
I do here?

$$\begin{array}{r} 3 \overset{1}{\cancel{2}} \overset{1}{2} 9 \\ - 1476 \\ \hline \\ 53 \end{array}$$

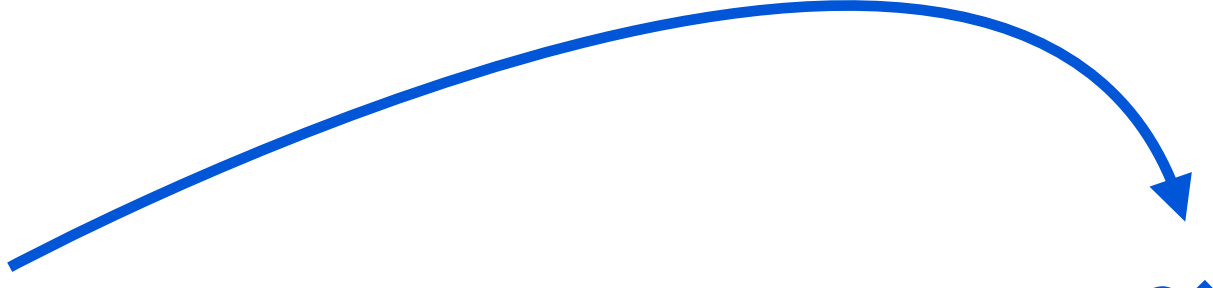
Back

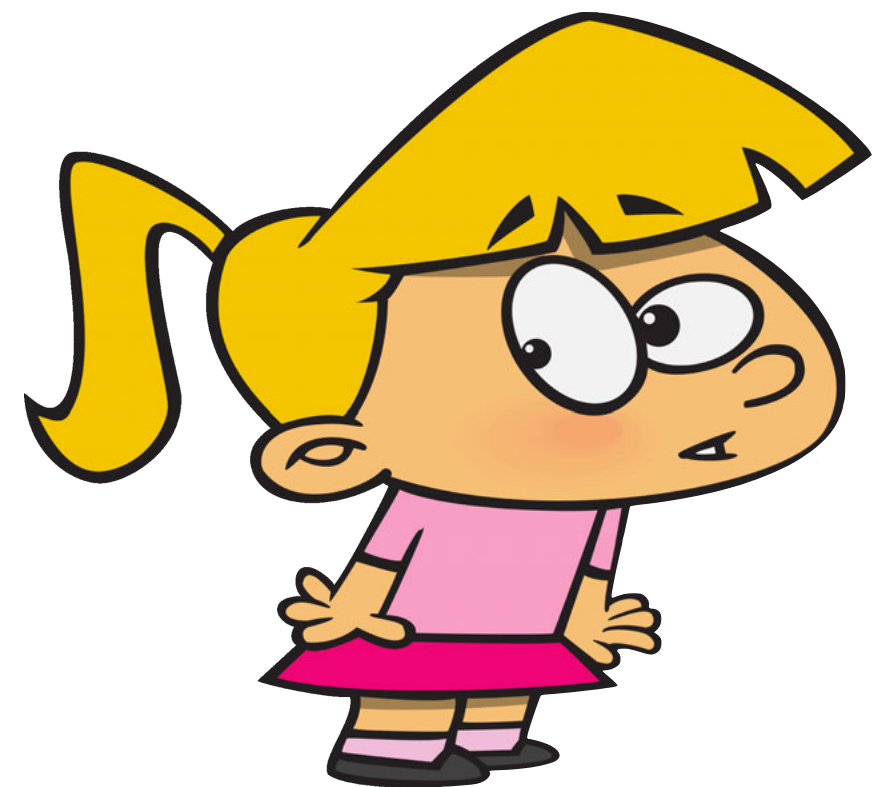
Think, pair then share your ideas.

Next

We cannot subtract four from one, so we need to **exchange** again.

We put a cross through the thousands number that we are exchanging with, and write one less than that number next to it, as we have taken one 'thousand'.


$$\begin{array}{r} \overset{2}{\cancel{3}} \overset{1}{\cancel{2}} \overset{1}{2} 9 \\ - 1476 \\ \hline 53 \end{array}$$



But where do we put the one 'thousand' that we have exchanged?

Think, pair then share your ideas.

Back

Next

We put it next to the number that was left after we had exchanged with the hundreds column. This means that we now have eleven hundreds in the hundreds column.

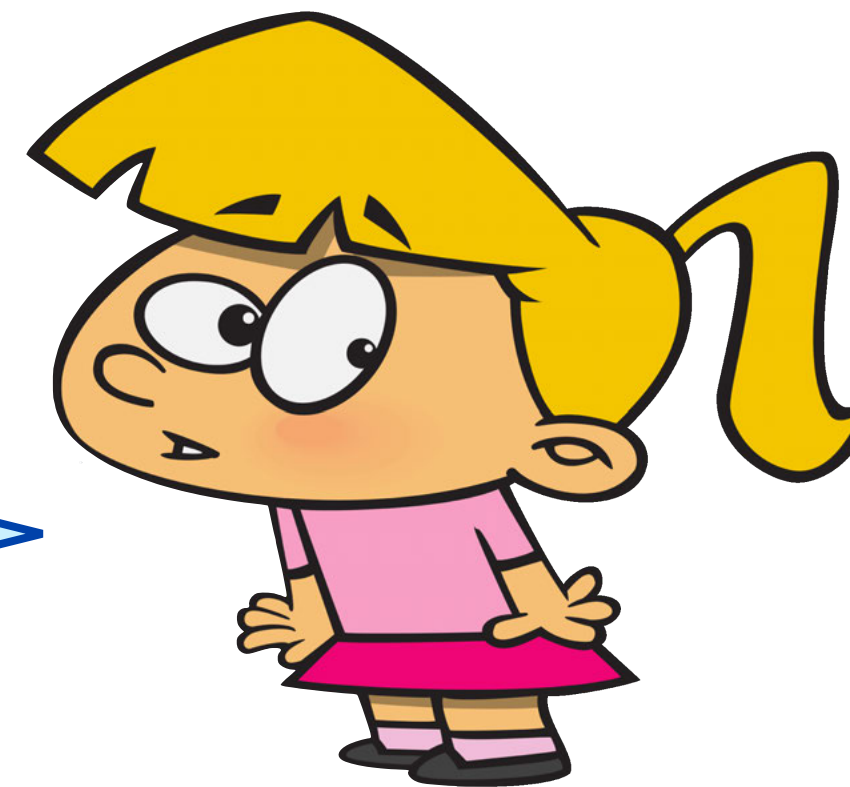
²~~3~~ ¹¹~~2~~ ¹2 9

- 1 4 7 6

5 3

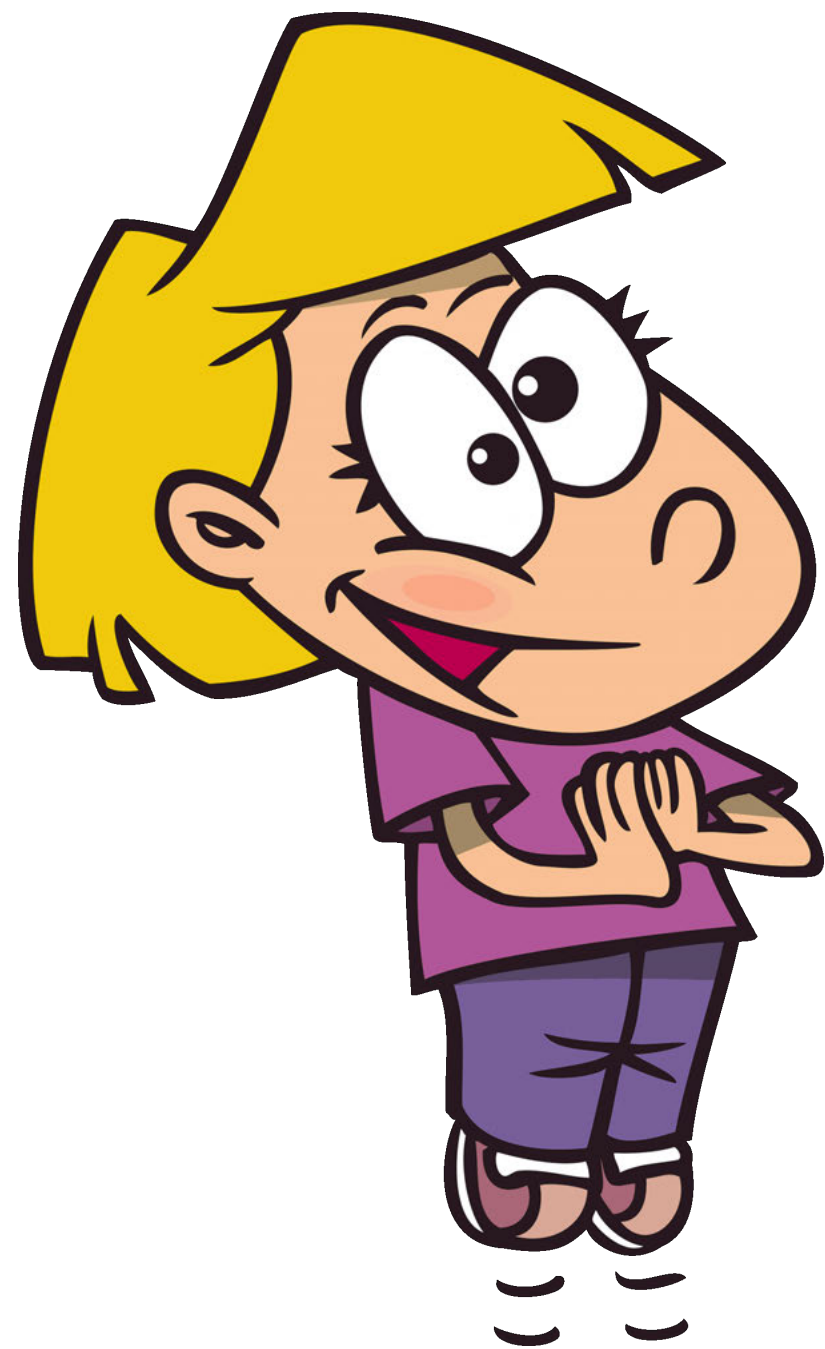
We can now subtract four from eleven.

OK, I get it now! Can you help me work out the rest of the column subtraction?



Back

Next



Did you solve it
correctly?

Fantastic!

Now let's see if you can
solve some more on
your own...

$$\begin{array}{r} \overset{2}{\cancel{3}} \overset{11}{\cancel{2}} \overset{1}{2} 9 \\ - 1476 \\ \hline 1753 \end{array}$$

Back

Next



See how many of these column subtractions you can solve in two minutes...

7 5 3

- 2 9 6

6 4 5 3

- 1 7 6 1

7 6 7 4

- 2 9 8 6

Think, pair, then share your answers.

Back

Next

How did you do? Did you complete all of the exchanges correctly?

$$\begin{array}{r} \overset{6}{\cancel{7}} \overset{14}{\cancel{5}} \overset{1}{3} \\ - 296 \\ \hline 457 \end{array}$$

$$\begin{array}{r} \overset{5}{\cancel{6}} \overset{13}{\cancel{4}} \overset{1}{5} 3 \\ - 1761 \\ \hline 4692 \end{array}$$

$$\begin{array}{r} \overset{6}{\cancel{7}} \overset{15}{\cancel{6}} \overset{16}{\cancel{7}} \overset{1}{4} \\ - 2986 \\ \hline 4688 \end{array}$$

Which did you find the most challenging and why?



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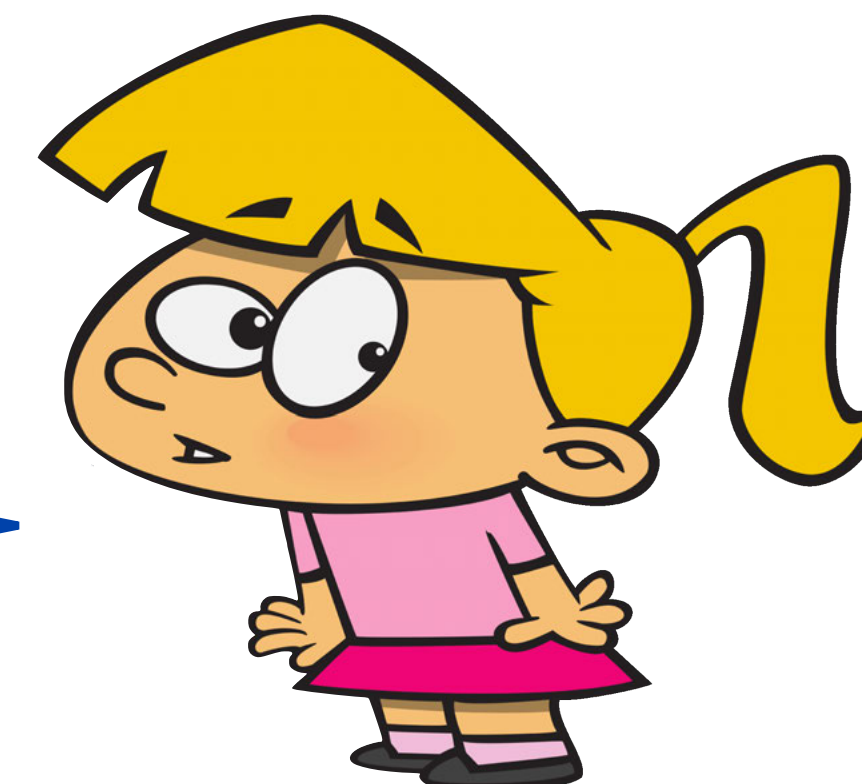
Next

$$\begin{array}{r} 2305 \\ - 1147 \\ \hline \\ \hline \end{array}$$

I'm stuck again!

I know I need to exchange so that I can calculate the ones column, but there are no tens!

What do I do?



Think, pair then share your ideas.

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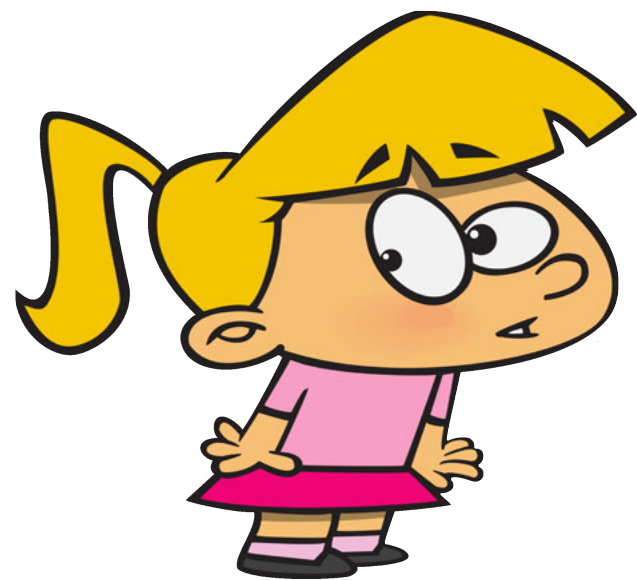
Next

As there are no tens to exchange with, we need to look at the next column to the left – the hundreds column.

$$\begin{array}{r} 2\overset{2}{\cancel{3}}\overset{1}{0}5 \\ - 1147 \\ \hline \end{array}$$

We put a cross through the hundreds number that we are exchanging with, and write one less than that number next to it.

Then we then put the one 'hundred' we have exchanged next to the number in the tens column.



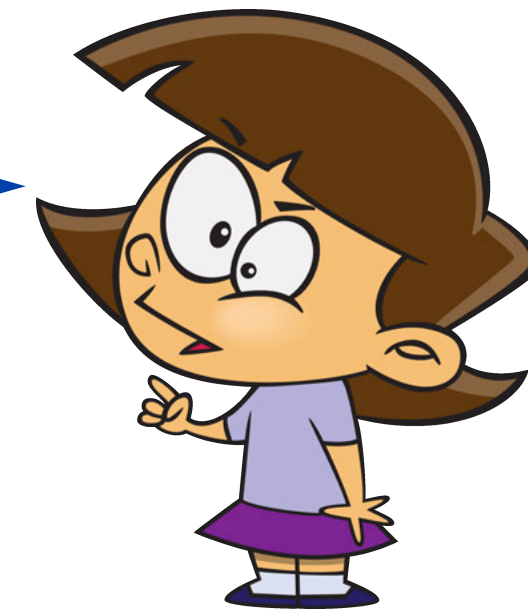
But why can't I just exchange from the hundreds column straight to the ones column?

Think, pair then share your ideas.

Back

Next

The number we have exchanged is one 'hundred' – if we put that straight into the ones column, the calculation would be $105 - 7$! So we need to pass it to the tens column first, and then exchange again there.



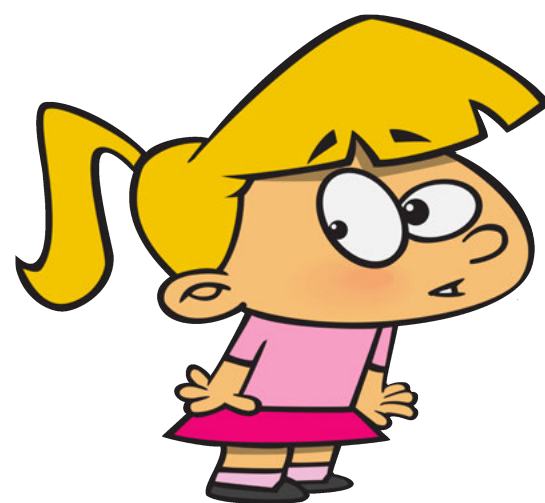
2 ²3 ⁹0 ¹5

- 1 1 4 7

The tens column now has 10 'tens'.

We put a cross through the number in the tens column, and write one less than that number next to it or above it, which is '9'.

We put the one ten we have exchanged next to the number in the ones column.



Now I understand! Can you help me find the answer?

Back

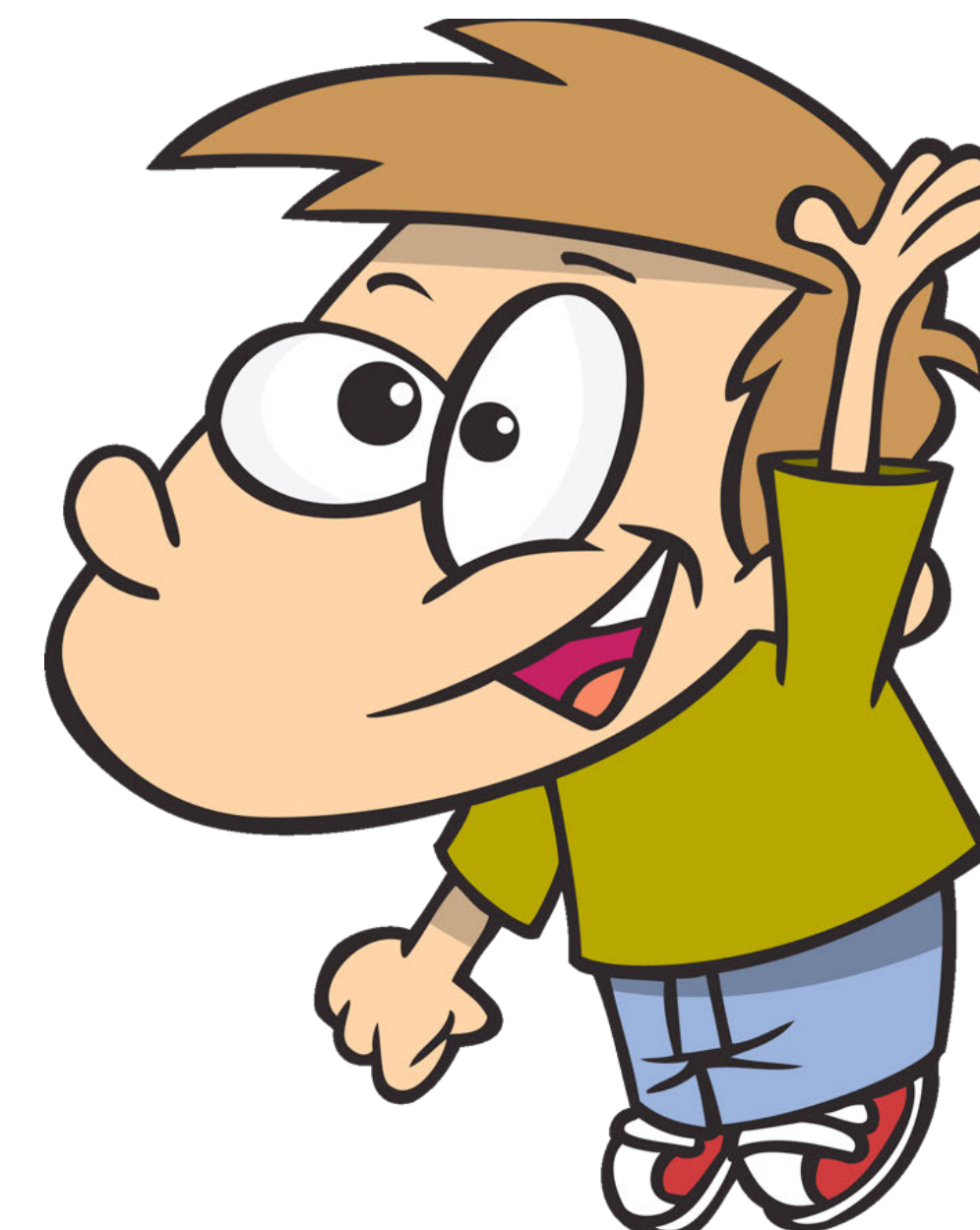
Next

$$\begin{array}{r}
 2305 \\
 - 1147 \\
 \hline
 1158
 \end{array}$$

Did you solve it
correctly?

Great work!

Now let's see if you can
solve some more on
your own...



Back

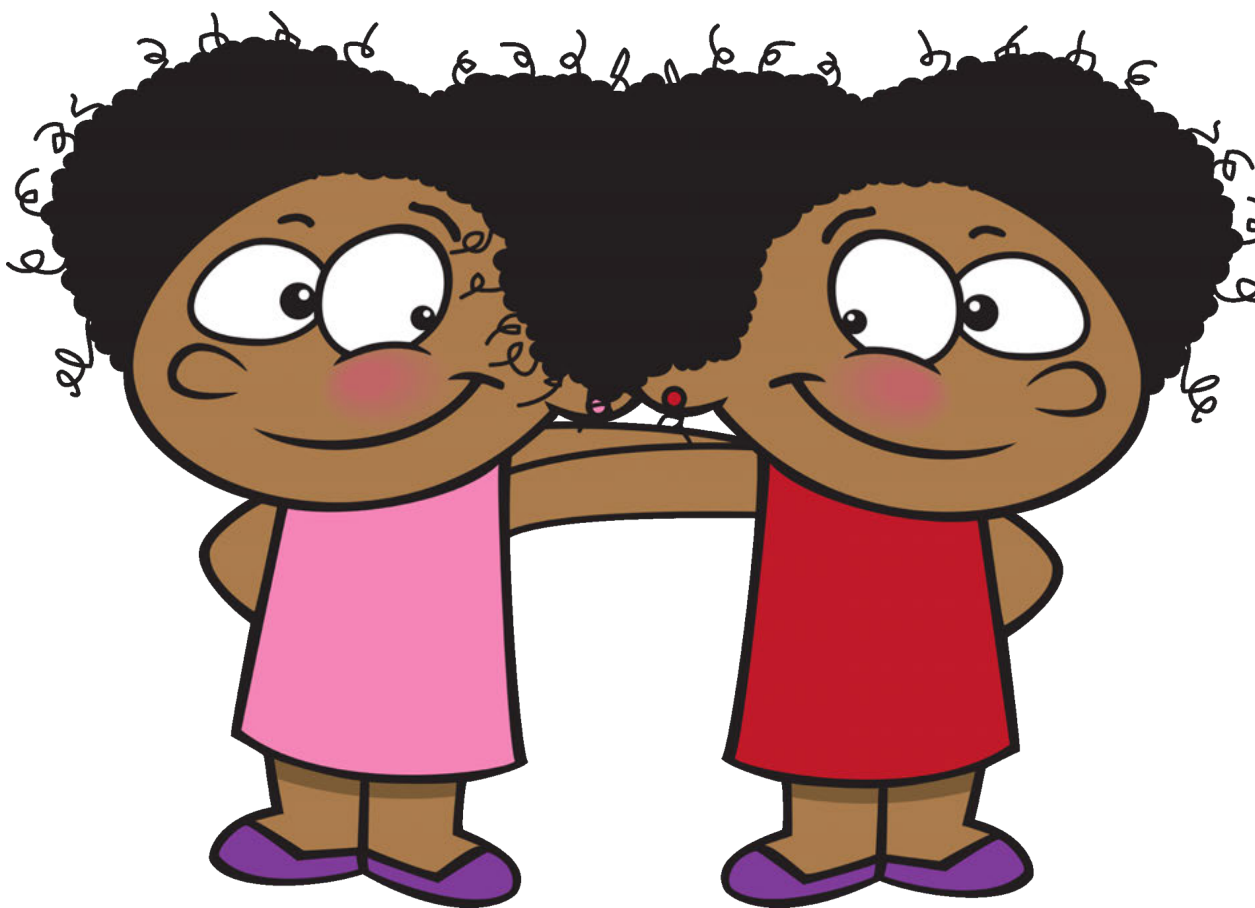
Next

With a partner, explain how this column subtraction has been solved.

$$\begin{array}{r} 6602 \\ - 3485 \\ \hline 3117 \end{array}$$

With a partner, solve this column subtraction. Remember to exchange correctly!

$$\begin{array}{r} 4076 \\ - 1283 \\ \hline \\ \hline \end{array}$$



Share your answer with the rest of the class.

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Next



Did you manage
to solve this one
correctly too?
Great work!

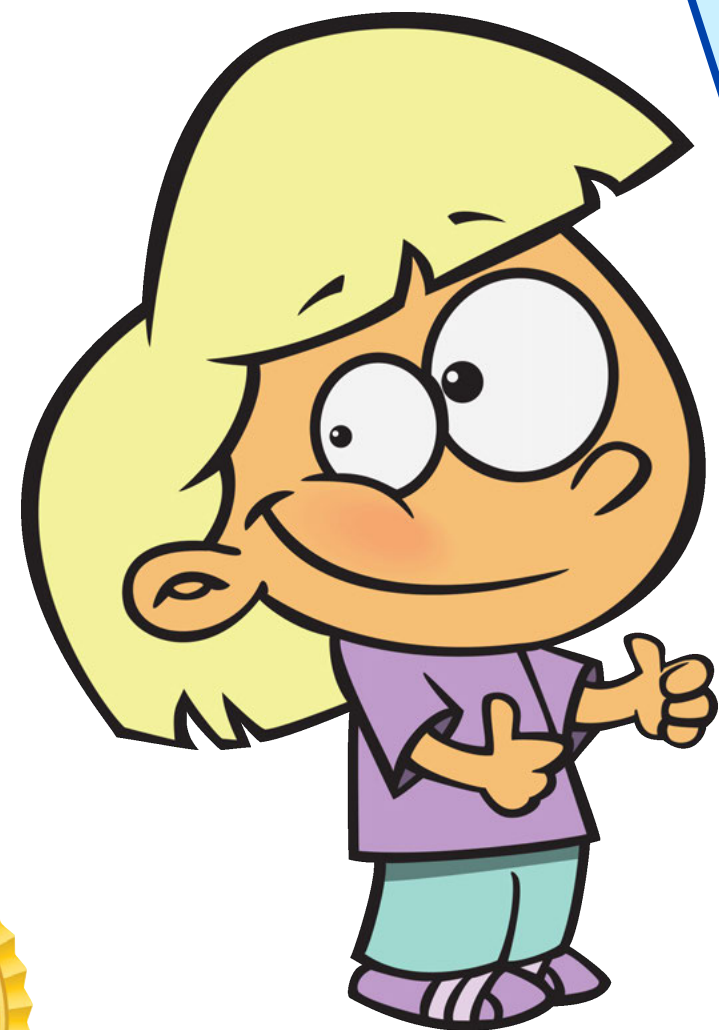
$$\begin{array}{r} \overset{3}{\cancel{4}} \overset{9}{\cancel{0}} \overset{1}{7} 6 \\ - 1283 \\ \hline 2793 \end{array}$$

Back

Next

Let's have a look at one more...

Using all of your knowledge and understanding, can you explain how to solve this?



$$\begin{array}{r} 5006 \\ - 2328 \\ \hline \\ \hline \end{array}$$

Remember what you have learnt about exchanging! Can you work out the answer?



Think, pair, then share your ideas.

Back

Next

As there are no tens or hundreds to exchange with, in order to solve this we need to exchange with the thousands column!

Next we have to exchange with the hundreds column, and then the tens column, so that we can turn the '6' in the ones column into sixteen.

$$\begin{array}{r} \overset{9}{\cancel{4}}\overset{9}{\cancel{5}}\overset{9}{\cancel{0}}\overset{1}{\cancel{0}}6 \\ - 2328 \\ \hline 2678 \end{array}$$



Well done if you managed to explain these steps!

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Next

Now it's time to put your
knowledge and
understanding to work with
some more sports day
problems to solve!



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Next

Plenary:

PB stands for '**Personal Best**'. It is the best time or score the athlete has achieved in a specific event.



Michael

I had a previous
PB score of
989cm for the
shot put. Today, I
scored a new **PB**
of **1017cm**!

I had a previous
PB score of
1279cm for the
shot put. Today, I
scored a new **PB**
of **1304cm**!



Alisha

Who has increased their **PB** the most?
Think, pair, then share your answers.

Back

Next

Plenary:



Michael

$$\begin{array}{r} \overset{9}{0} \cancel{1} \overset{10}{0} \cancel{1} \overset{1}{7} \\ - \quad 989 \\ \hline 28 \end{array}$$

$$\begin{array}{r} \overset{2}{1} \cancel{3} \overset{1}{0} \cancel{1} \overset{1}{4} \\ - 1279 \\ \hline 25 \end{array}$$



Alisha

Alisha increased her PB by 25cm, but Michael increased his PB by 28cm!

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