Place Value Lesson 2

Tuesday 9th June 2020

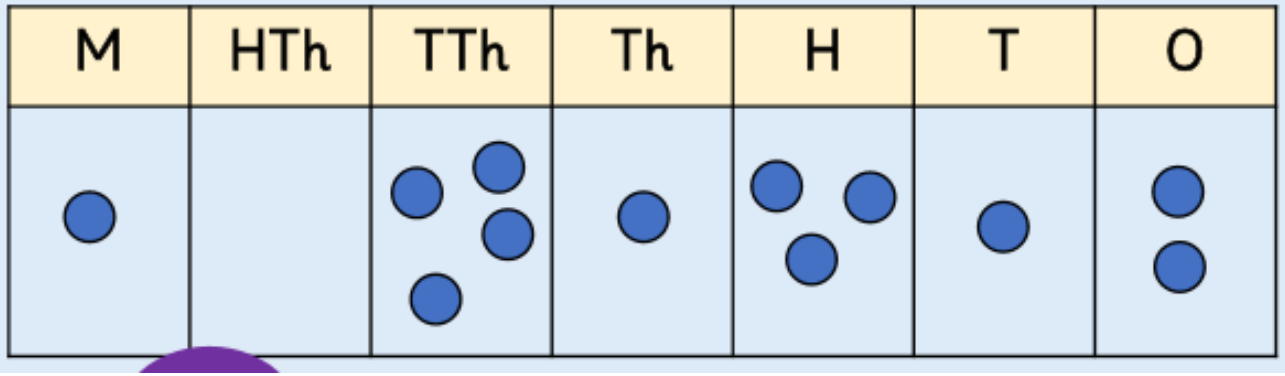
L.O – I am learning to answer reasoning and problem solving place value questions.

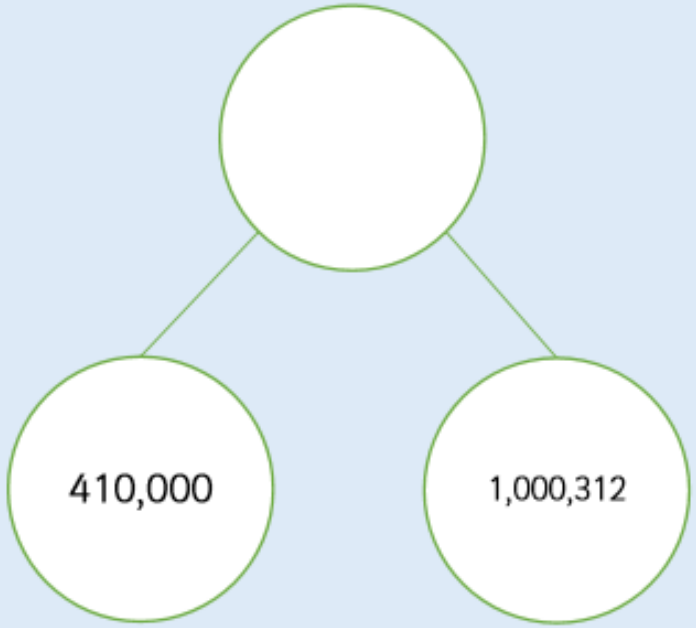
Starter:

Match the representations to the numbers in digits.

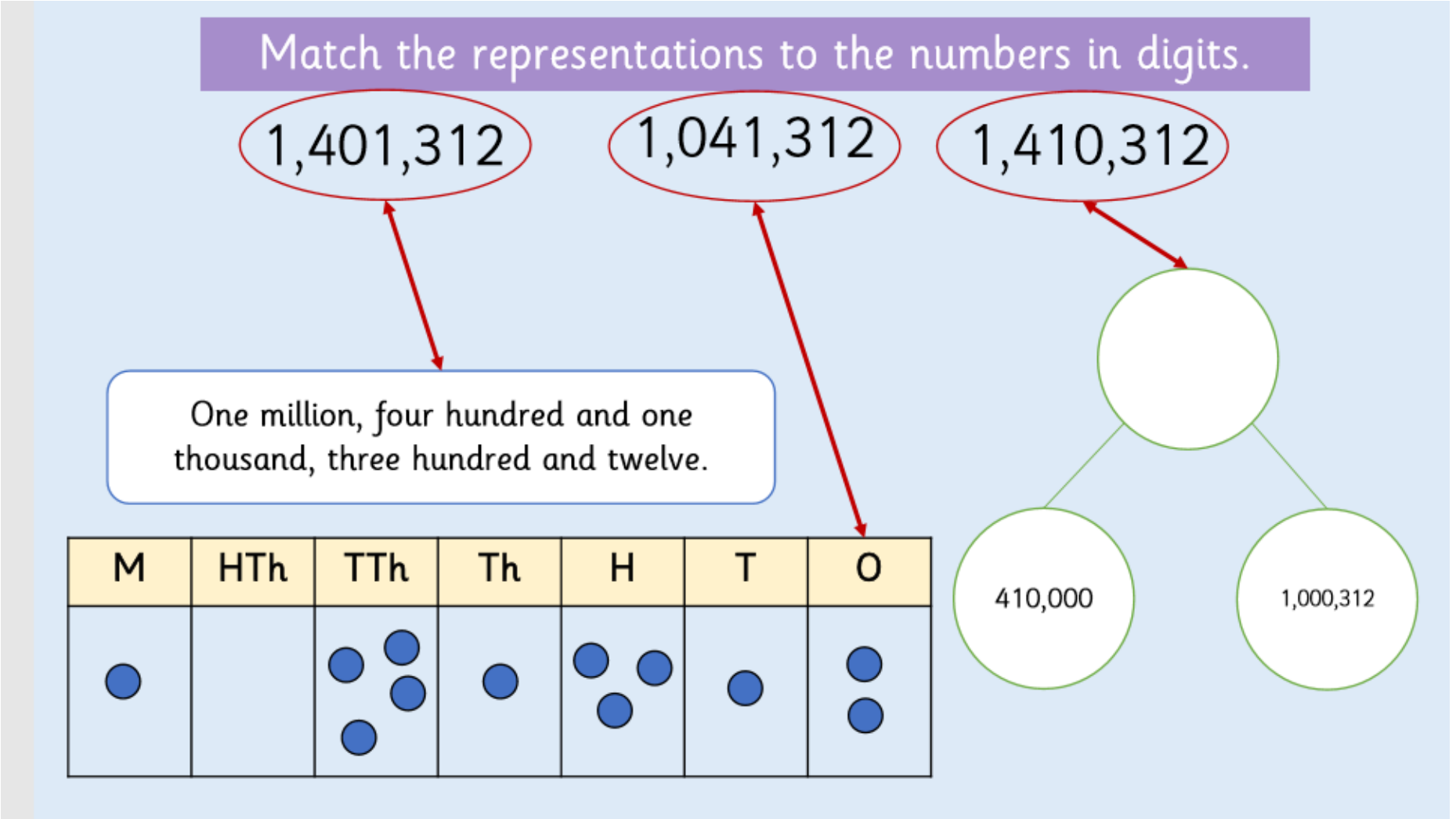
1,401,312 1,041,312 1,410,312

One million, four hundred and one thousand, three hundred and twelve.

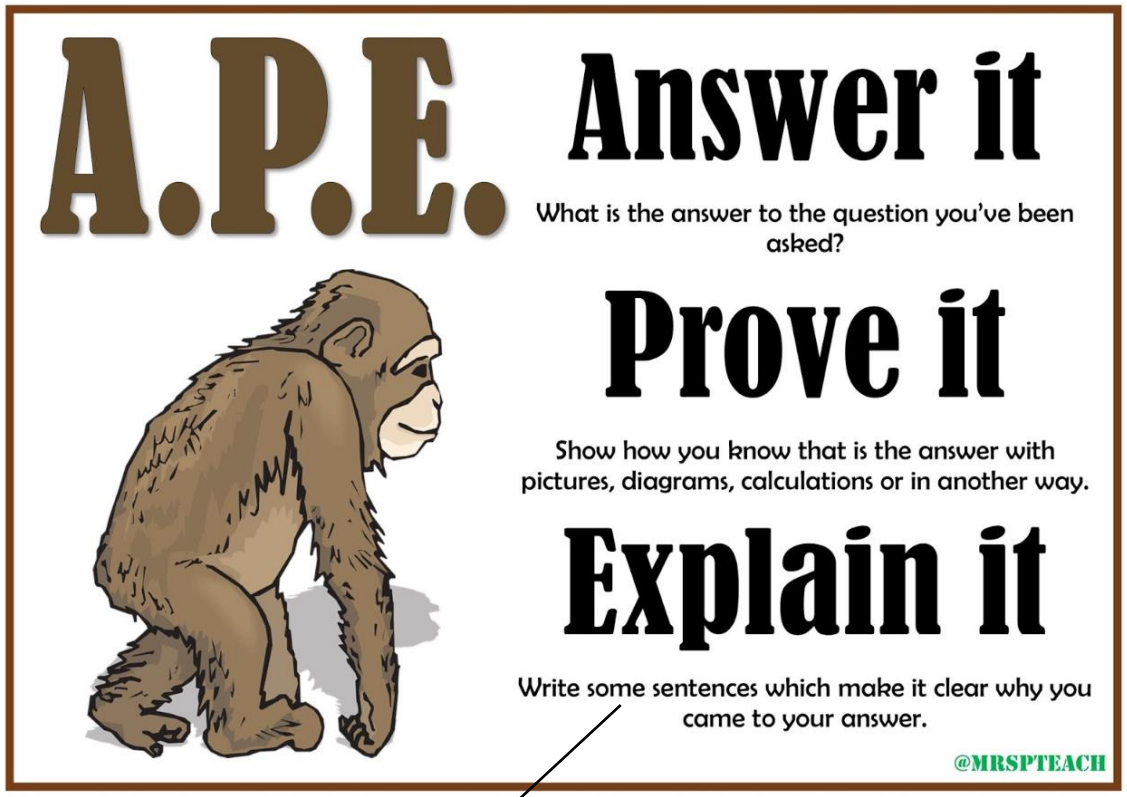




Answers:

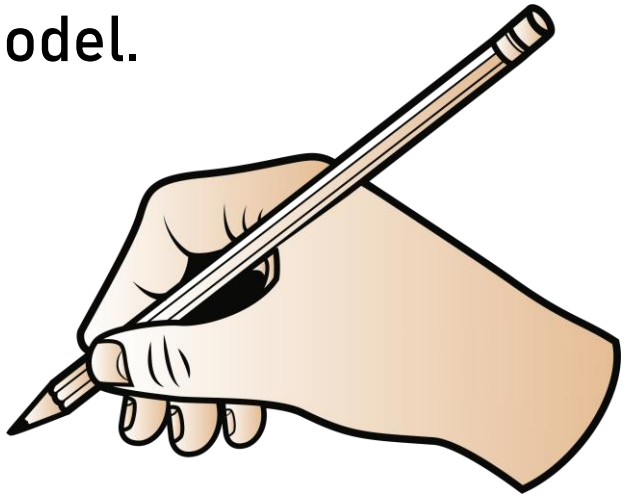

Match the representations to the numbers in digits.
1,401,312
1,041,312
1,410,312
One million, four hundred and one thousand, three hundred and twelve.
M
HTh
TTh
Th
H
T
O
410,000
1,000,312

Reasoning Questions



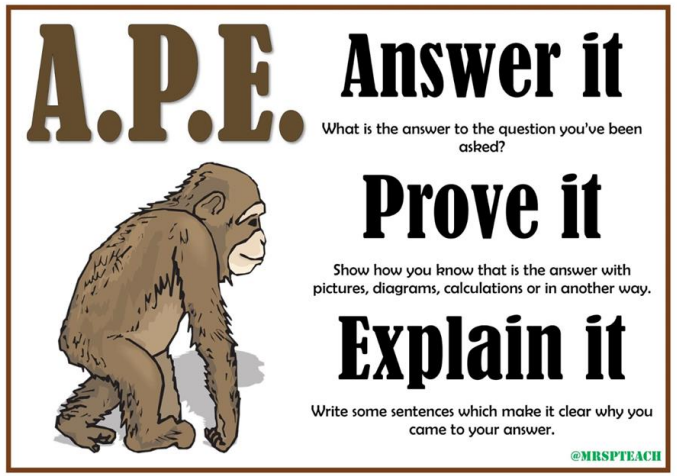
This could also explain the mistakes that have been made.

Remember some answers require a written answer. When you see the words 'explain' or 'prove it,' use the A.P.E model.



Let's practise using APE:

Your turn:



Dora has the number 824,650

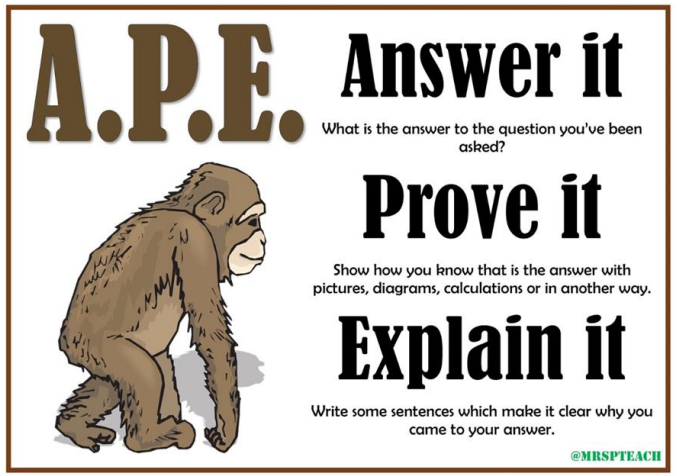
She subtracts forty thousand from her number.

She thinks her new number is 820,650

Is she correct?

Explain how you know.

Answer:



Dora has the number 824,650

She subtracts forty thousand from her number.

She thinks her new number is 820,650

Is she correct?

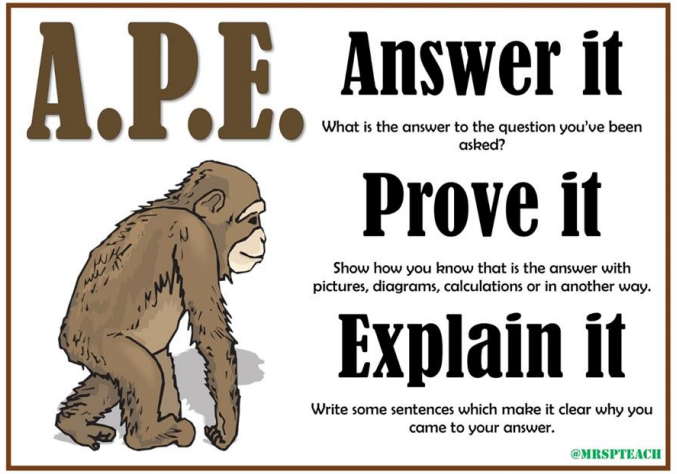
Explain how you know.

Answer Prove Explain

Dora is incorrect. 824,650 – 40,000 = 784,650 (this should be supported with your working out e.g. column method/bar model). Dora subtracted 4,000 rather than 40,000 which is how she got to her answer of 820,650 instead of 784,650.

Let's practise using APE:

Your turn:



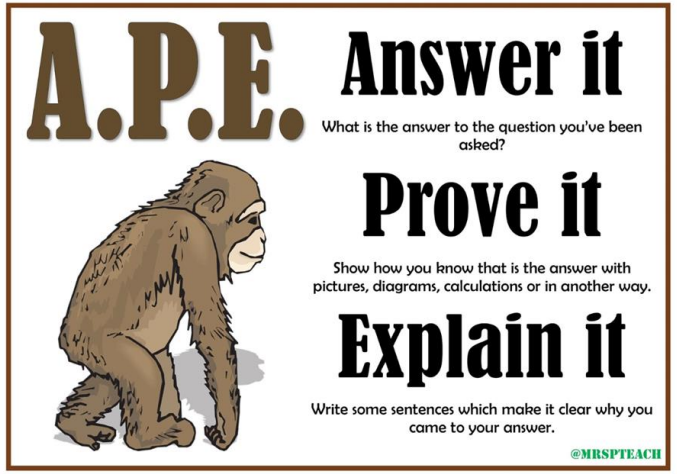
5b. Simon says,

If I add ninety-six thousand and two to any six-digit number, I will have to change the thousands column and the ten-thousands column.

Is he correct?

Explain how you know, using examples to help you.

Answer:



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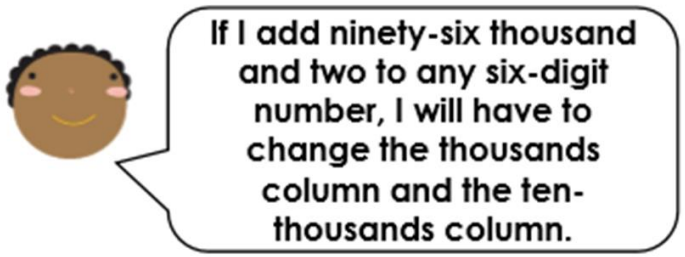


Is he correct?

Explain how you know, using examples to help you.

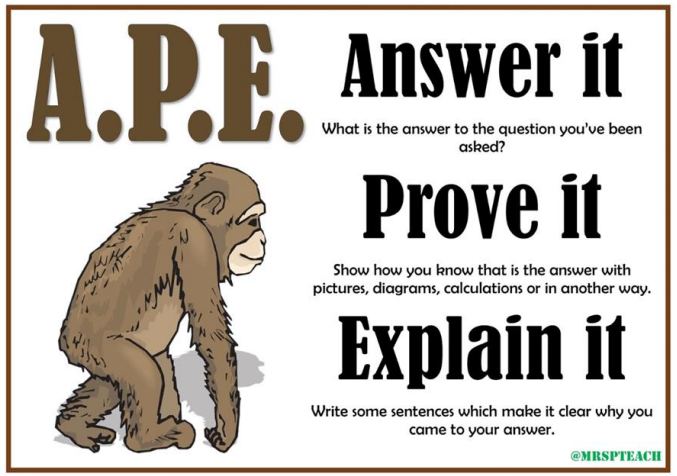
Answer Prove Explain

Simon is incorrect. As soon as you cross the ten boundary, multiple columns will need to change. For example, 999,999 + 96,002 = 1,096,001.

(Sometimes you may want to explain before you prove it. That's fine too.)

Let's practise using APE:

Your turn:



5b. Freddie thinks the smallest possible missing number would be 30,001.

$6{,}310{,}724 + 40{,}000 < 6{,}320{,}724 +$?

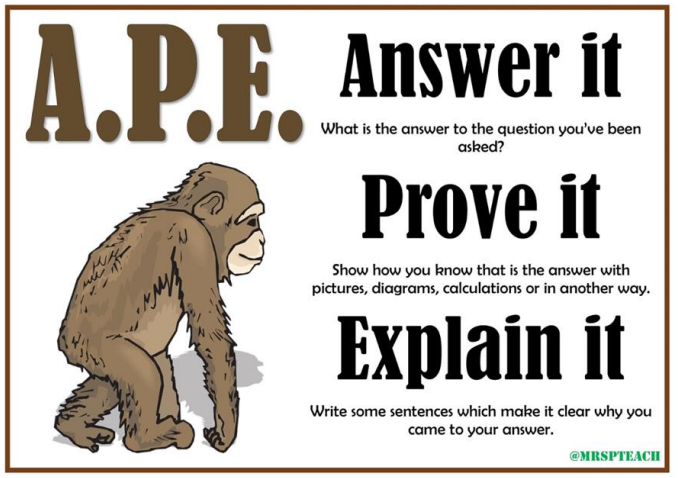
Do you agree? Explain why.

Answer:

5b. Freddie thinks the smallest possible missing number would be 30,001.

$6{,}310{,}724 + 40{,}000 < 6{,}320{,}724 +$?

Do you agree? Explain why.



Answer Prove Explain

Freddie is correct. The first part of the equation equals 6,350,724. If Freddie adds 30,001 to 6,320,724 it equals 6,358,725, which would be 1 greater than the first part of the equation. If Freddie adds any lower than 30,001, it won't work e.g. 6,350,724 < 6,320,724 + 30,000 and the answer would be 6,350,724 which would make the equation incorrect.

Problem Solving Questions

Some problem solving questions will ask you to find all the possibilities. Try and work in a methodical way to ensure you don't miss any.

Try this one:

Put a digit in the missing space to make the statement correct.

$$4{,}62\_\_\_{,}645 < 4{,}623{,}642$$

Is there more than one option? Can you find them all?

Answers:

Both numbers start with 4,62 and as the first number is less than the second number, we must look at the 4th digit on the second number. In order for the equation to be correct.
The first missing digit can be 0, 1 and 2.

Put a digit in the missing space to make the statement correct.

$$4{,}62\ \_\_\ {,}645 < 4{,}623{,}642$$

4,620, 645 < 4,623,642
4,621, 645 < 4,623,642
4,622, 645 < 4,623,642

Is there more than one option? Can you find them all?

Your turn:

Use the digit cards and statements to work out my number.

- The ten thousands and hundreds have the same digit.
- The hundred thousand digit is double the tens digit.
- It is a six-digit number.
- It is less than six hundred and fifty-five thousand.

Is this the only possible solution?

Answer:

Use the digit cards and statements to work out my number.

0	3	3	5	5	6	7

- The ten thousands and hundreds have the same digit.
- The hundred thousand digit is double the tens digit.
- It is a six-digit number. First bit of information we need
- It is less than six hundred and fifty-five thousand.

Is this the only possible solution?

Must be either 3 or 5 as these are the only digits where there are two of them.

__ 3 __ 3 __ __ or __ 5 __ 5 __ __

The only double option we have is 3 and 6. If we are using the 3 for this digit then we must use 5 for the clue above.

6 5 __ 5 3 __

The third digit must be less than 5.

6 5 3 5 3 __ or 6 5 0 5 3 __

Then use the remaining digits to find the possibilities.

653530, 653537, 6505337, 650533

Your turn:

Eva has ordered eight 6-digit numbers.

The smallest number is 345,900

The greatest number is 347,000

All the other numbers have a digit total of 20 and have no repeating digits.

What are the other six numbers?

Can you place all eight numbers in ascending order?

Your turn:

Eva has ordered eight 6-digit numbers.

The smallest number is 345,900

The greatest number is 347,000

All the other numbers have a digit total of 20 and have no repeating digits.

What are the other six numbers?

Can you place all eight numbers in ascending order?

The digits in 345,900 already total more than 20 (21) so our numbers must start with 346.

3 + 4 + 6 = 13 so the remaining digits must total 7.
Remember we can't repeat any of the remaining digits:

We could use these combinations:

0 4 3 0 1 6 0 2 5 1 2 4

Here are some examples of numbers you could make:

345,900 346,016 346, 124 346,340

346, 430, 346, 601 346, 610 347,000

(There are other possibilities)