

# Contents: Chapter 3

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# Chapter 3:

## Addition

# PIRATE LEAGUE





Winnie  
and I drew  
a total of eight  
**X**'s and six  
dots.

That's 8 tens  
and 6 ones,  
which makes  
86 coins.



$$\begin{array}{c} \text{XXXX}: \\ \text{XXXX} \\ = 86 \end{array}$$

Adding 4 tens to  
46 increases the  
tens digit by 4.

So,  
 $46 + 40 = 86$ .



$$46 + 40 = 86$$

Coins:  
 $\begin{array}{c} \text{XXXX}: \\ \text{XXXX} \\ = 46 \end{array}$

Coins:  
 $\begin{array}{c} \text{XXXX} \\ = 40 \end{array}$

Coins:  
 $\begin{array}{c} \text{XXX} : \\ \text{XXX} \\ = 37 \end{array}$

Coins:  
 $\begin{array}{c} \text{XX} \text{XX} \\ = 52 \end{array}$



Aye,  
well  
done.

Now, what  
be the sum  
o' Alex's coins  
'n' Grogg's  
coins?

All together,  
Grogg and I  
drew eight **X**'s  
and nine dots.

8 tens  
and 9 ones  
is 89.



$$\begin{array}{c} \text{XXX} : \\ \text{XX} \text{XX} \\ = 89 \end{array}$$

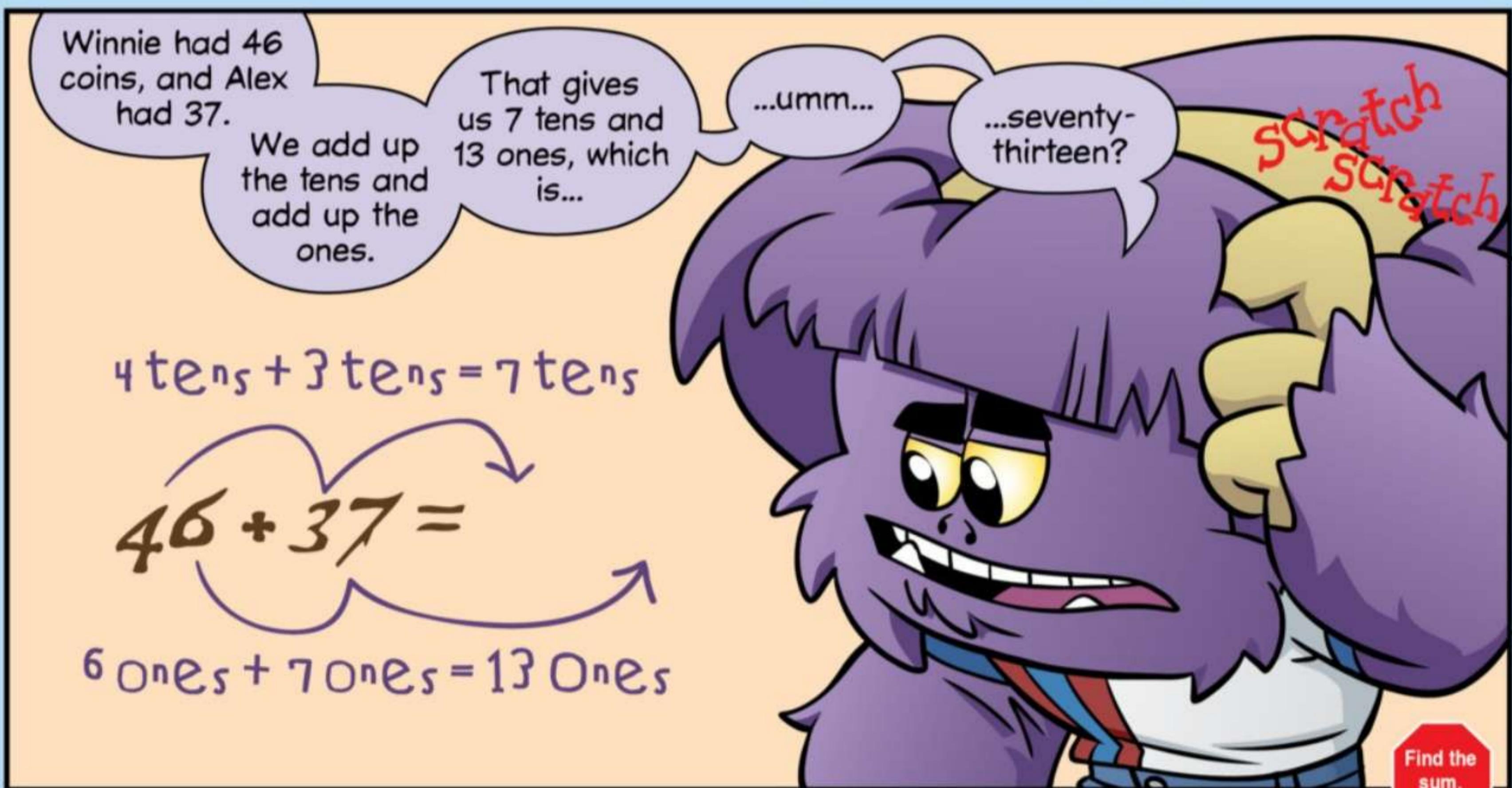
We add up  
the tens, and  
add up the  
ones. That  
makes  
89.

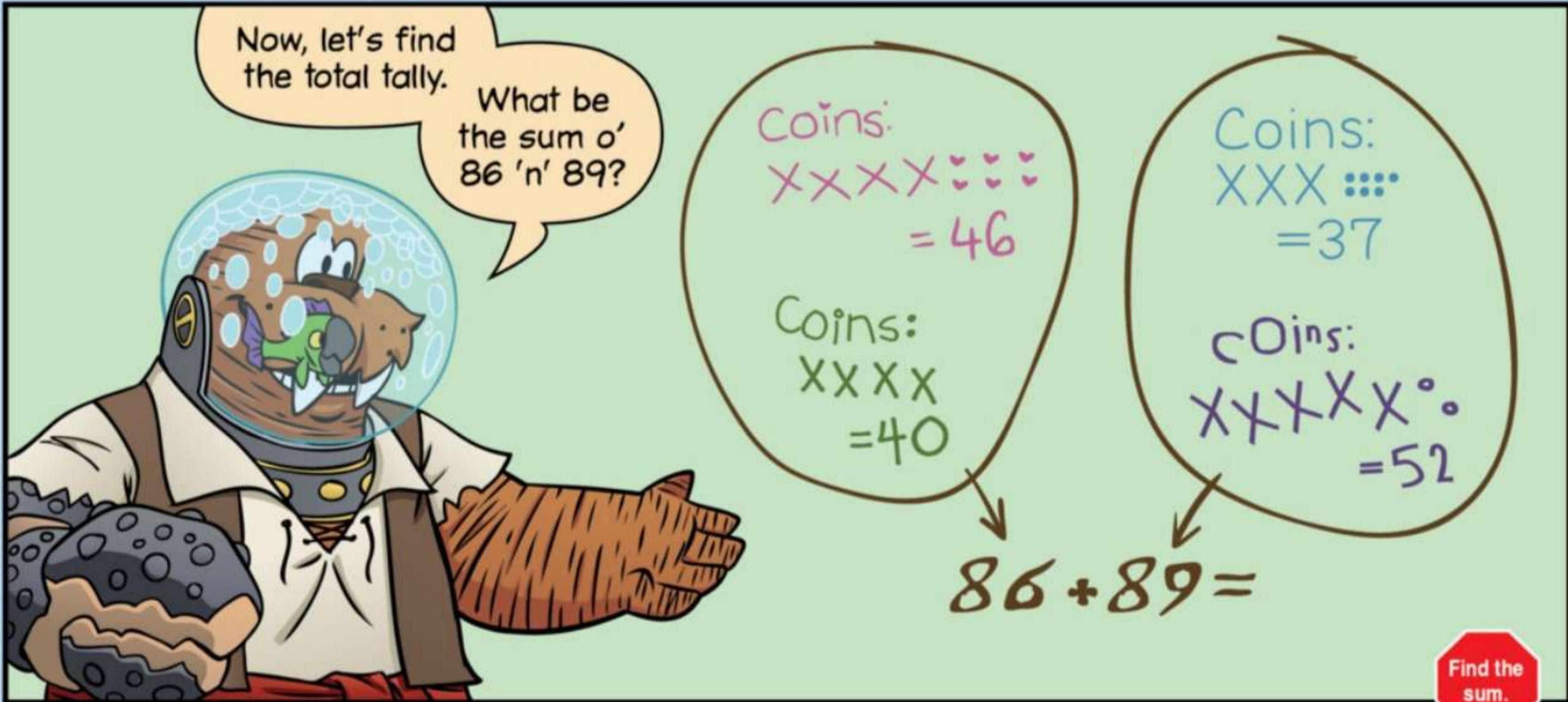
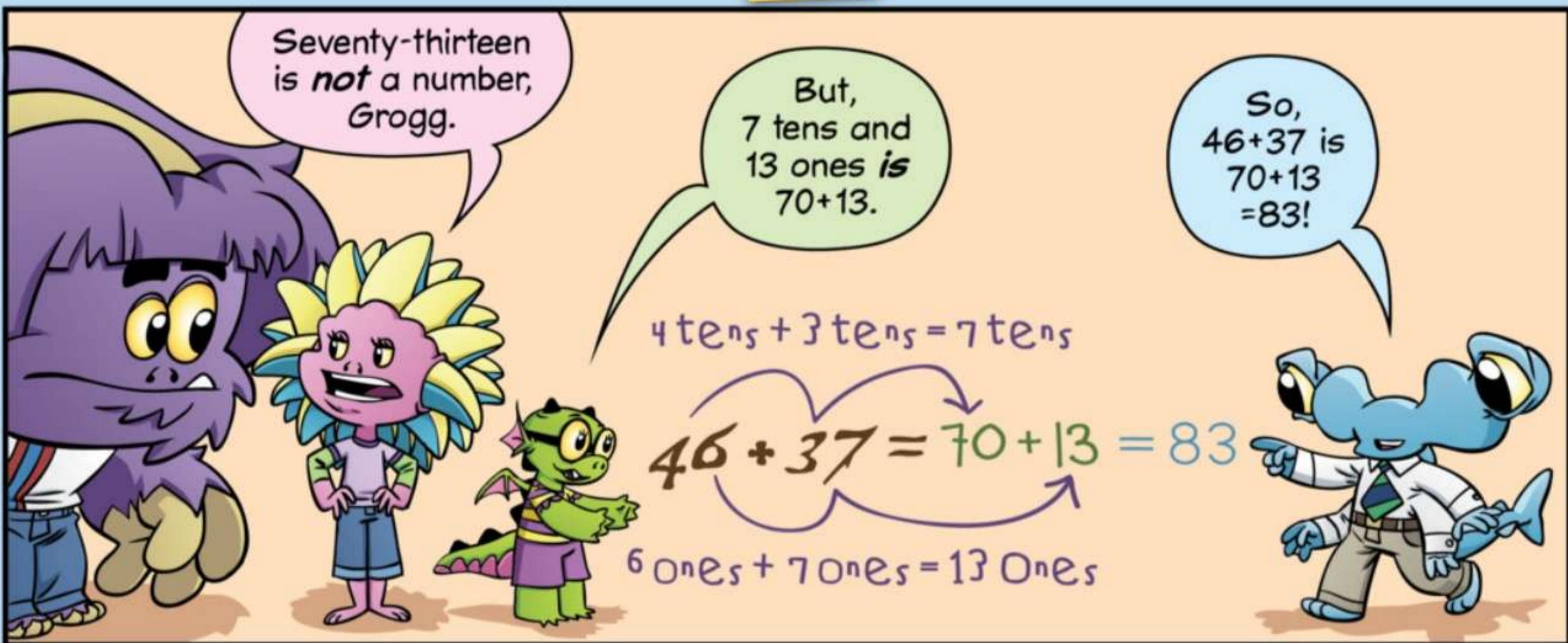
$$3 \text{ tens} + 5 \text{ tens} = 8 \text{ tens}$$

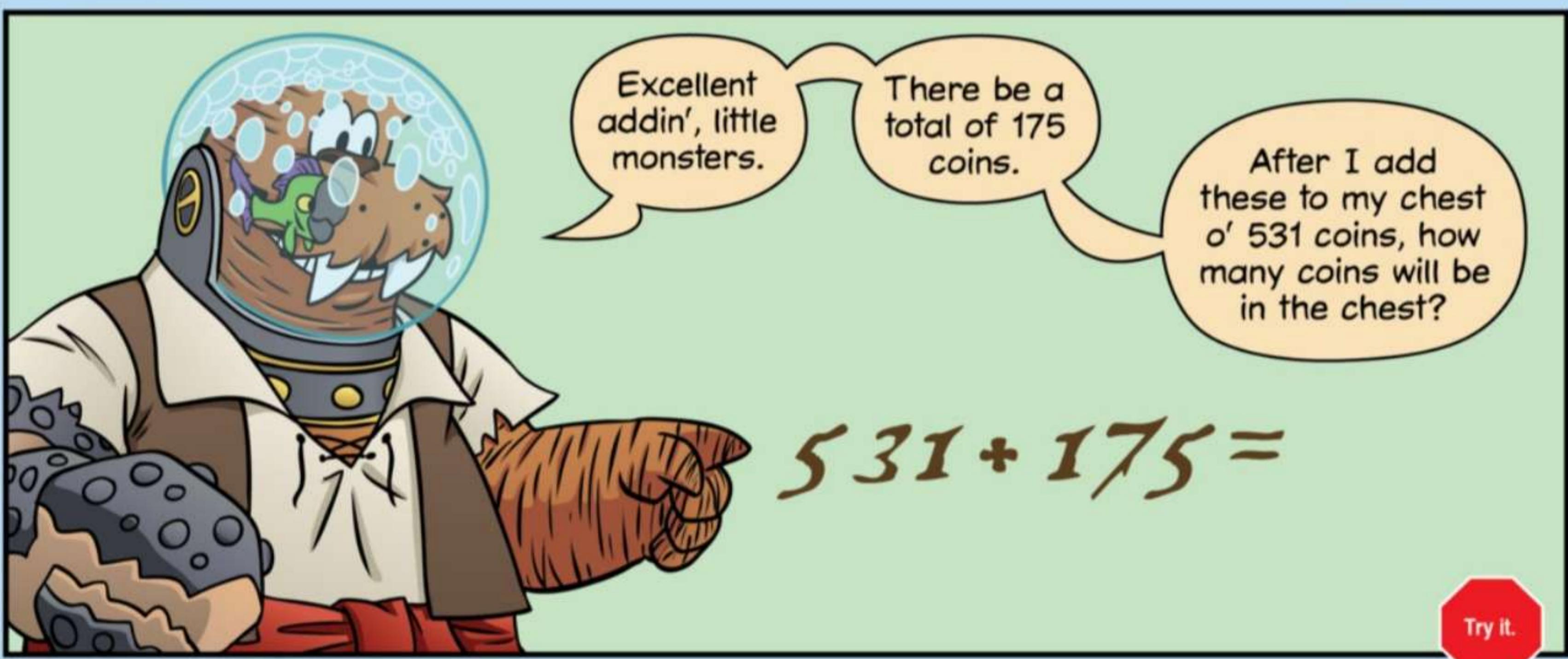
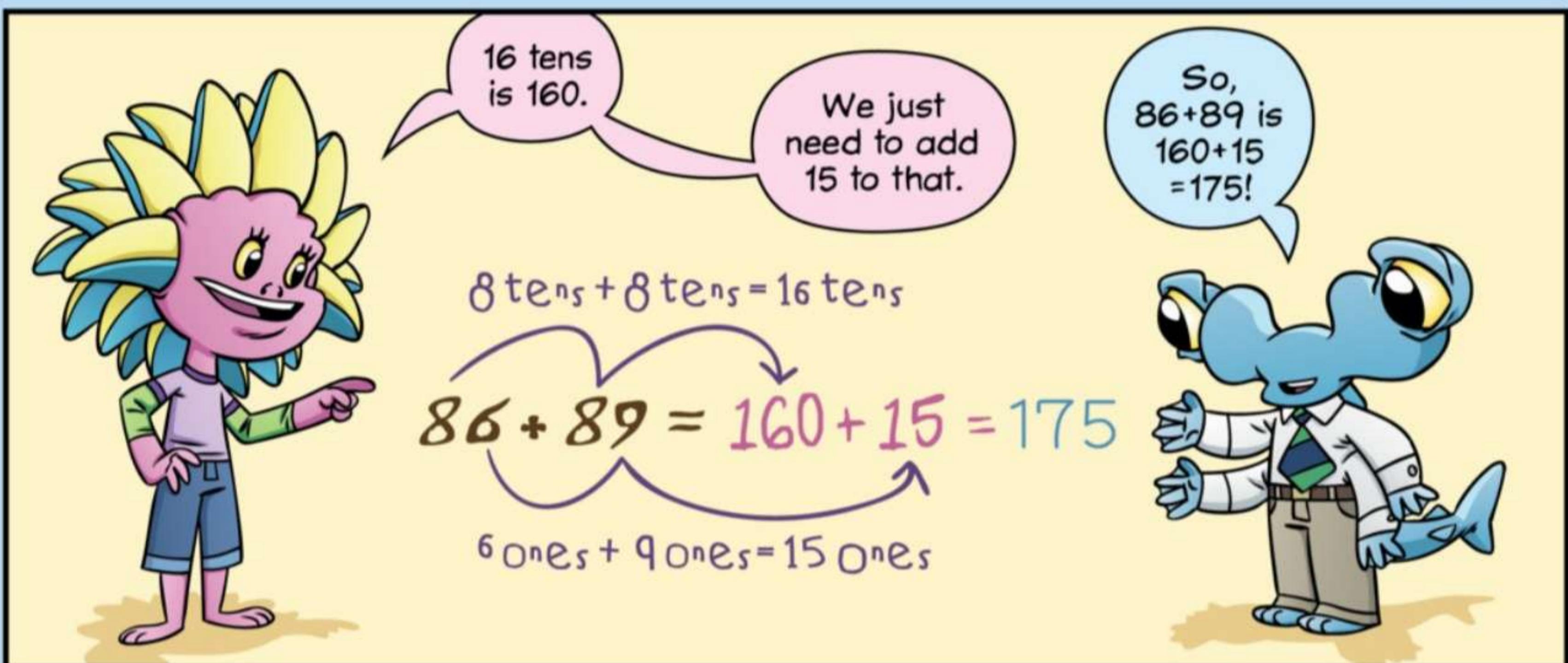
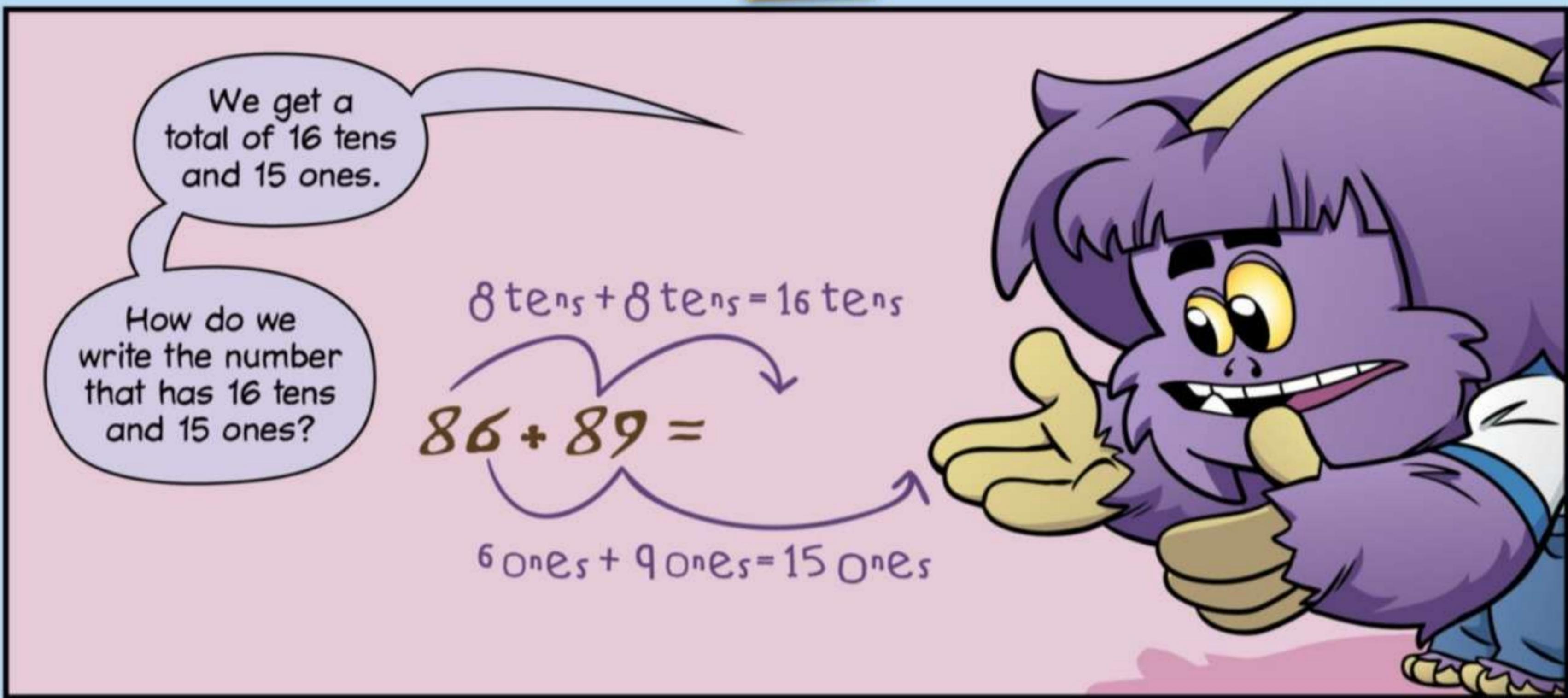
$$37 + 52 = 89$$

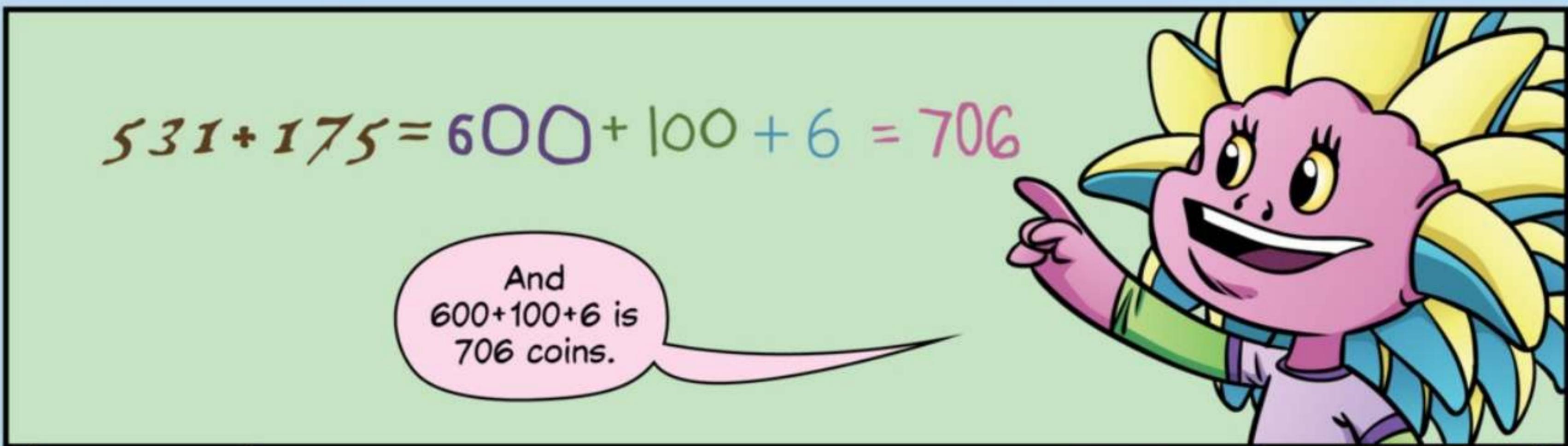
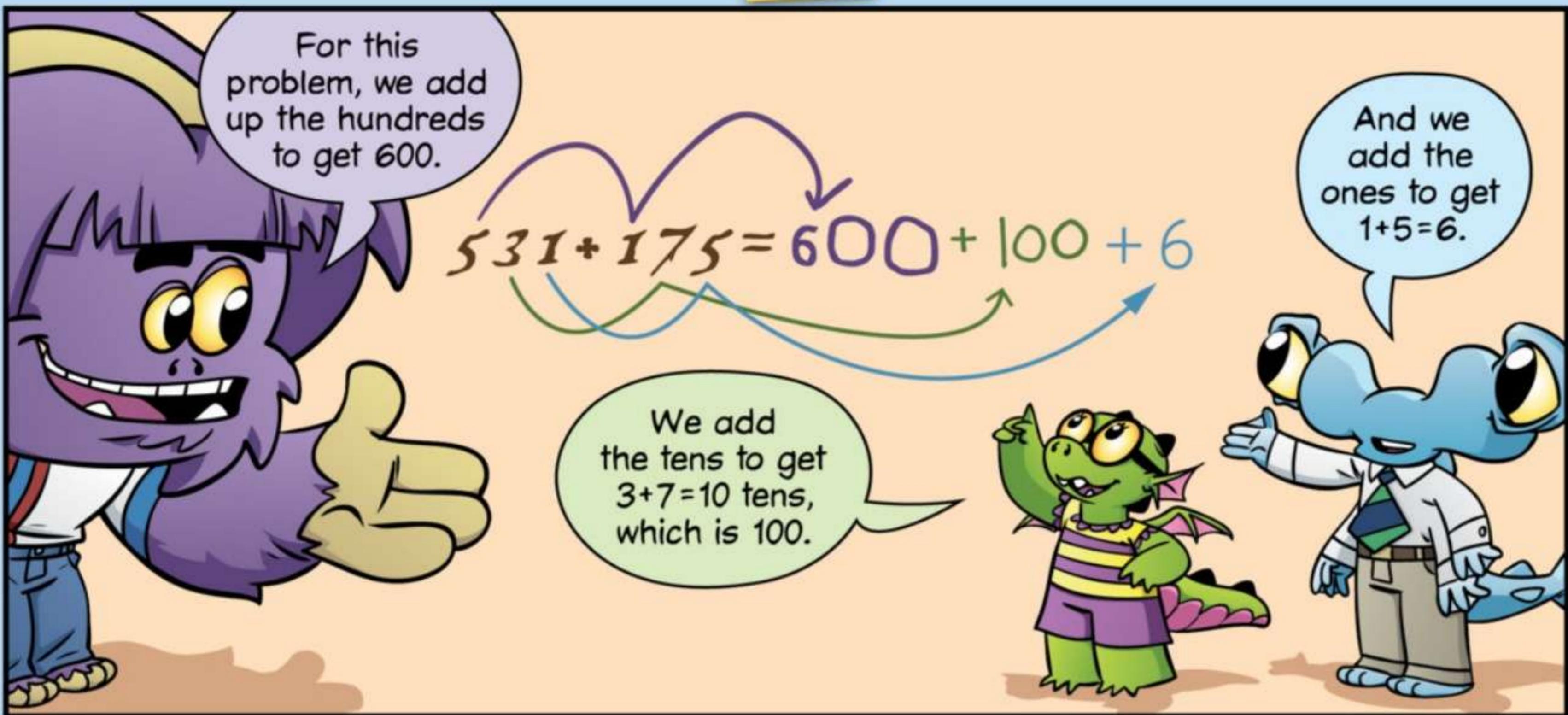
$$7 \text{ ones} + 2 \text{ ones} = 9 \text{ ones}$$

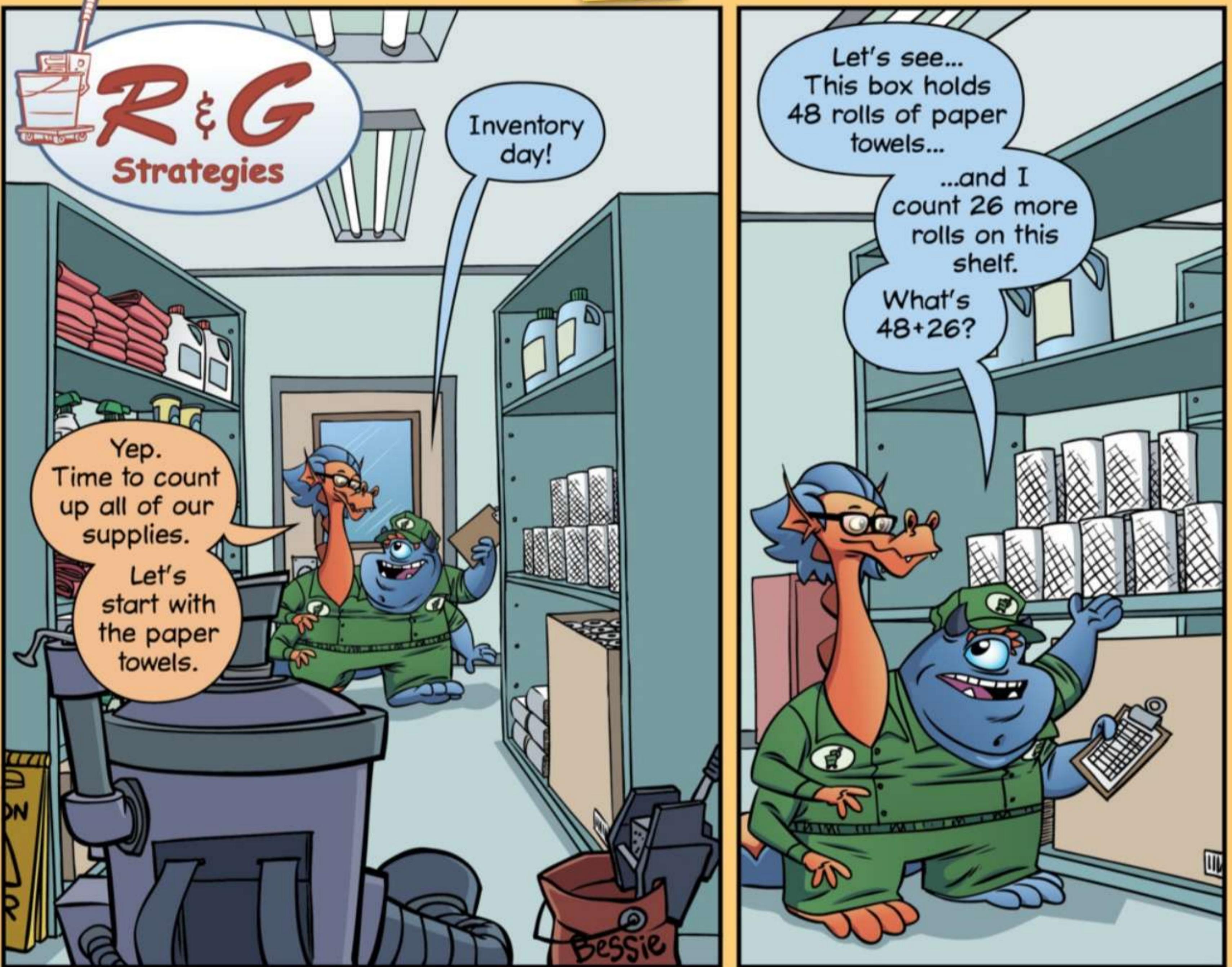


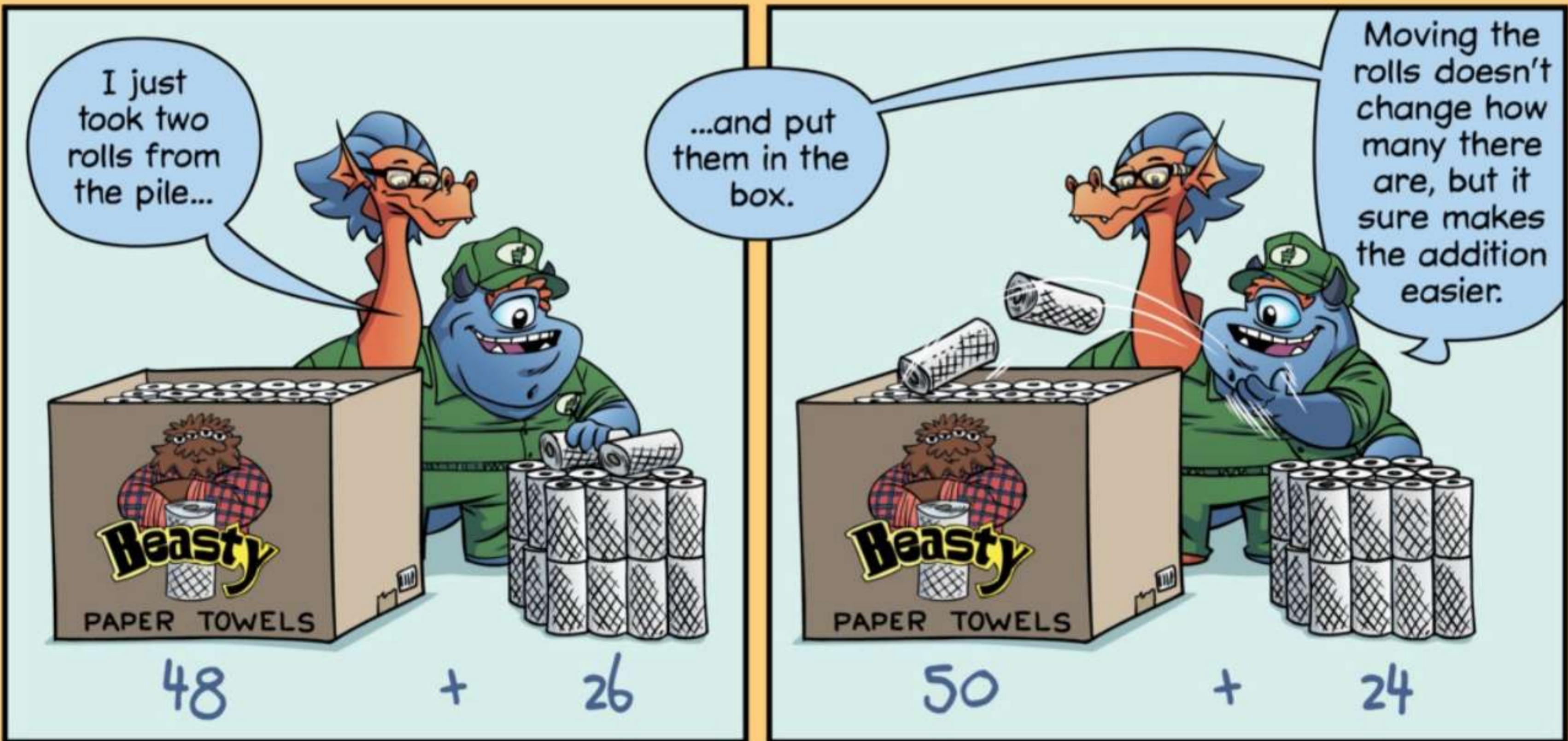
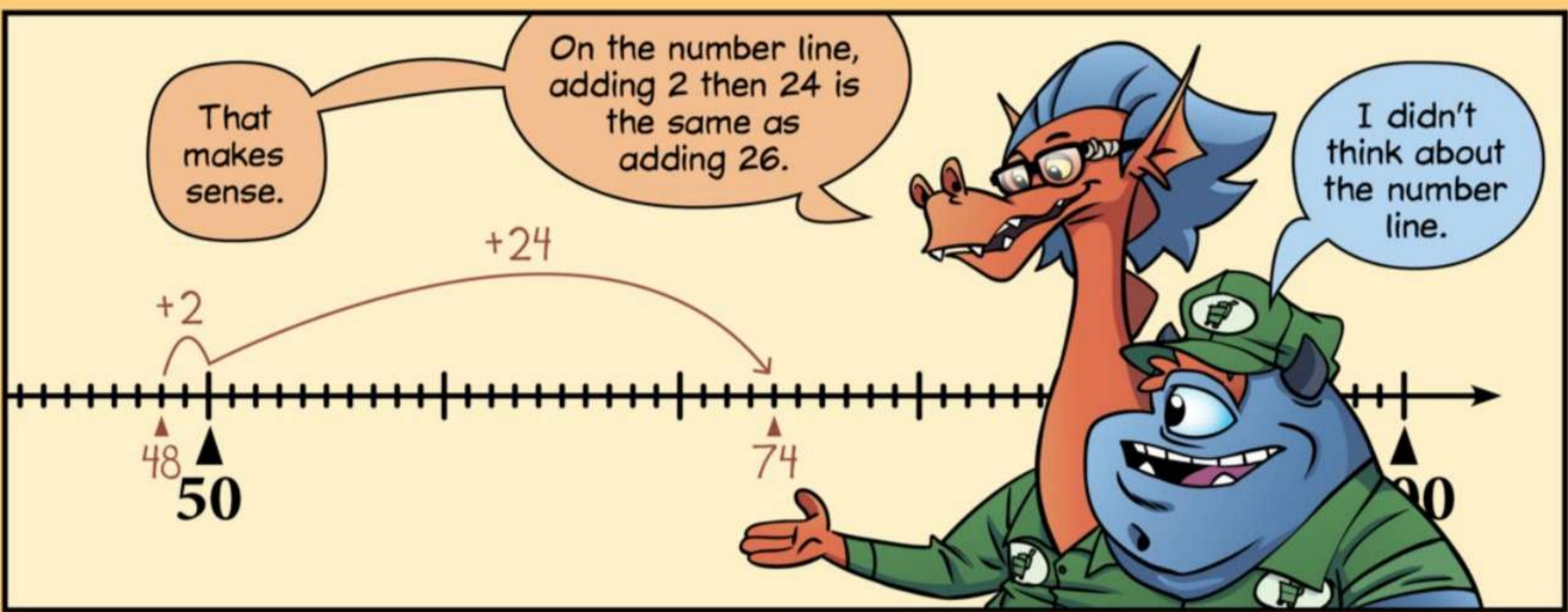
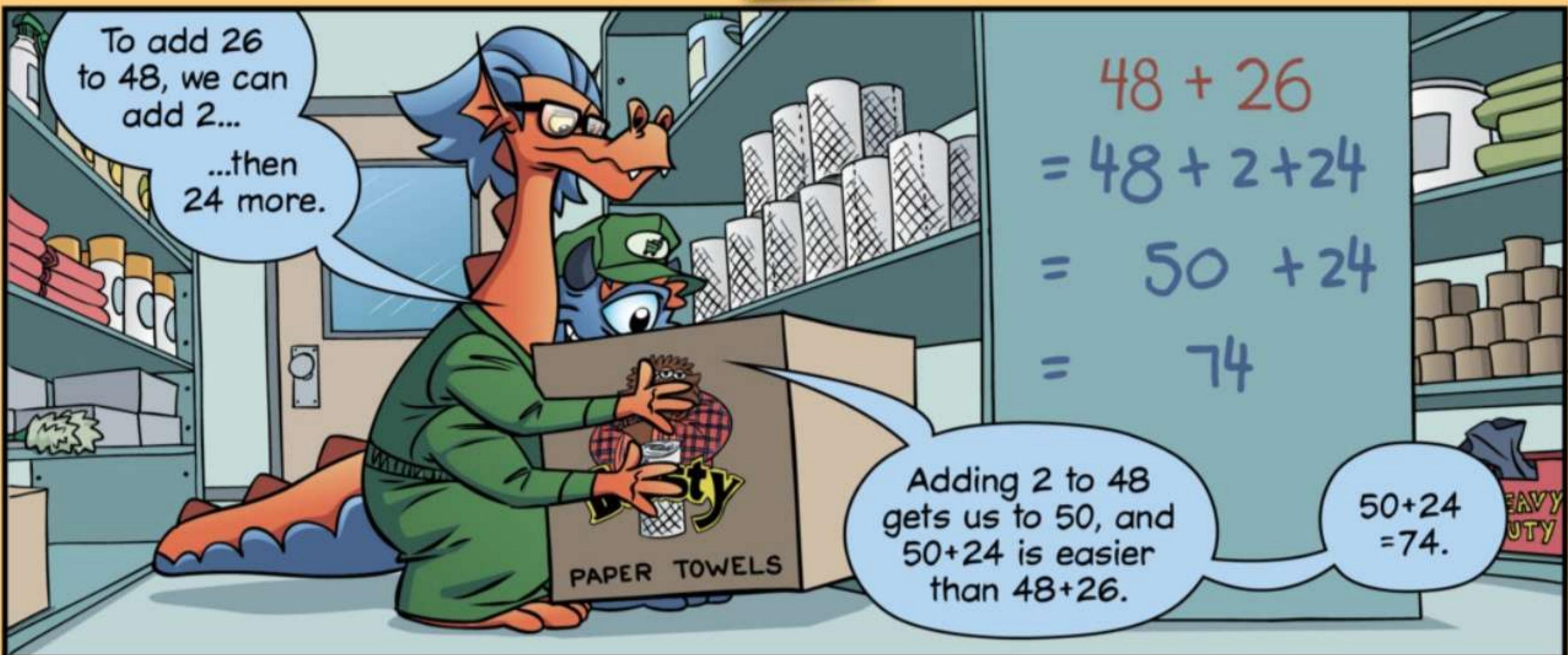


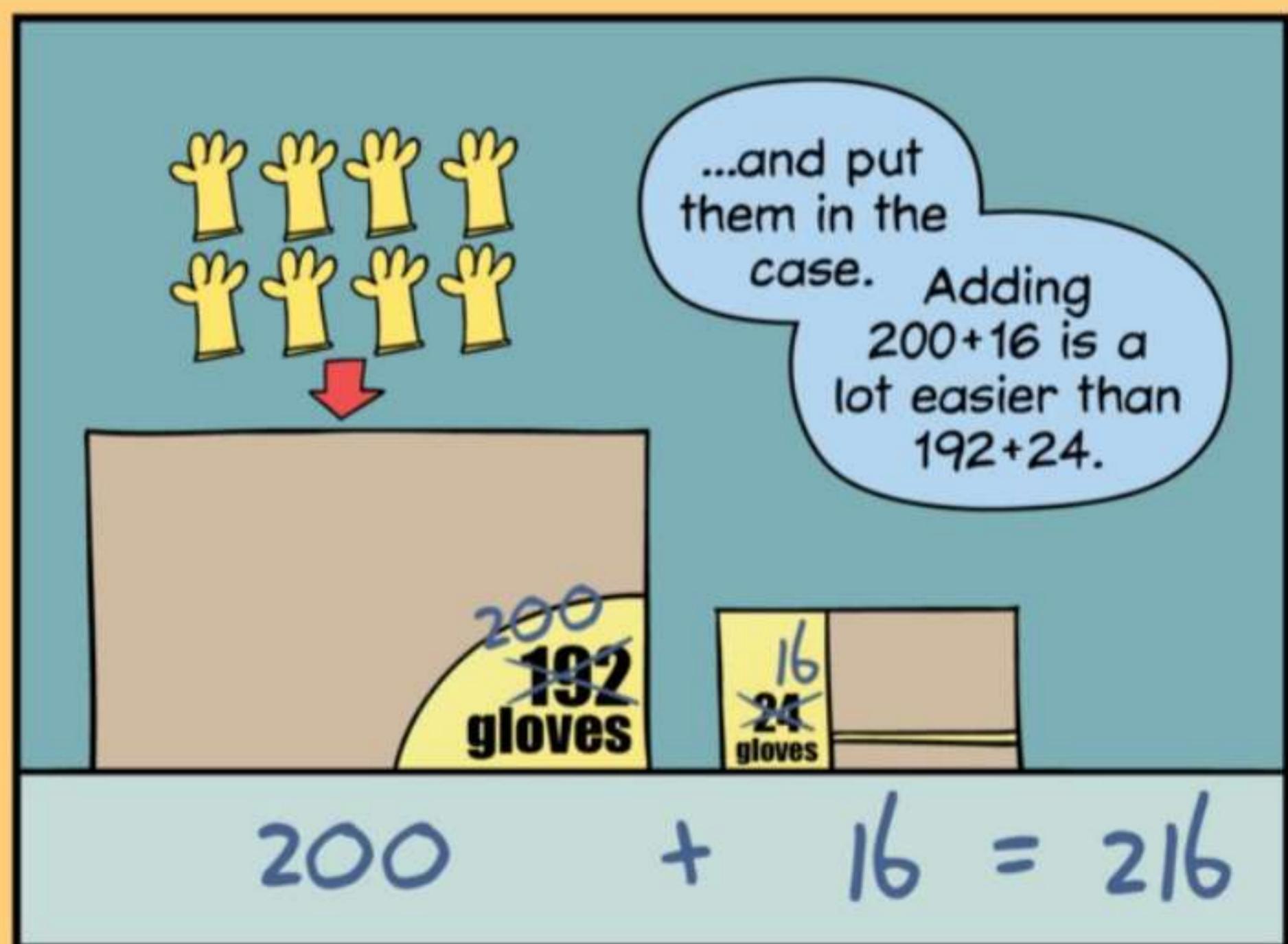
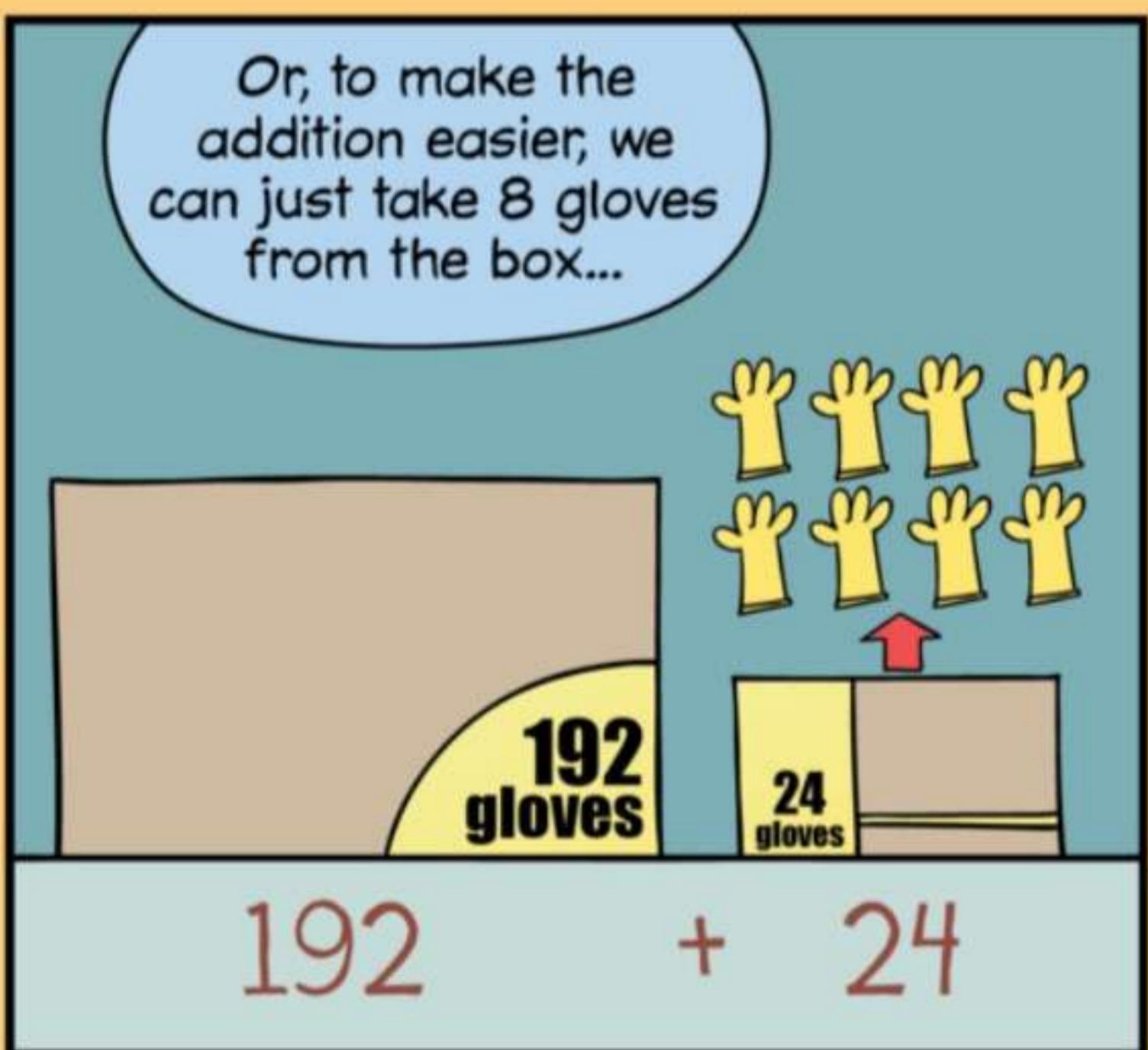
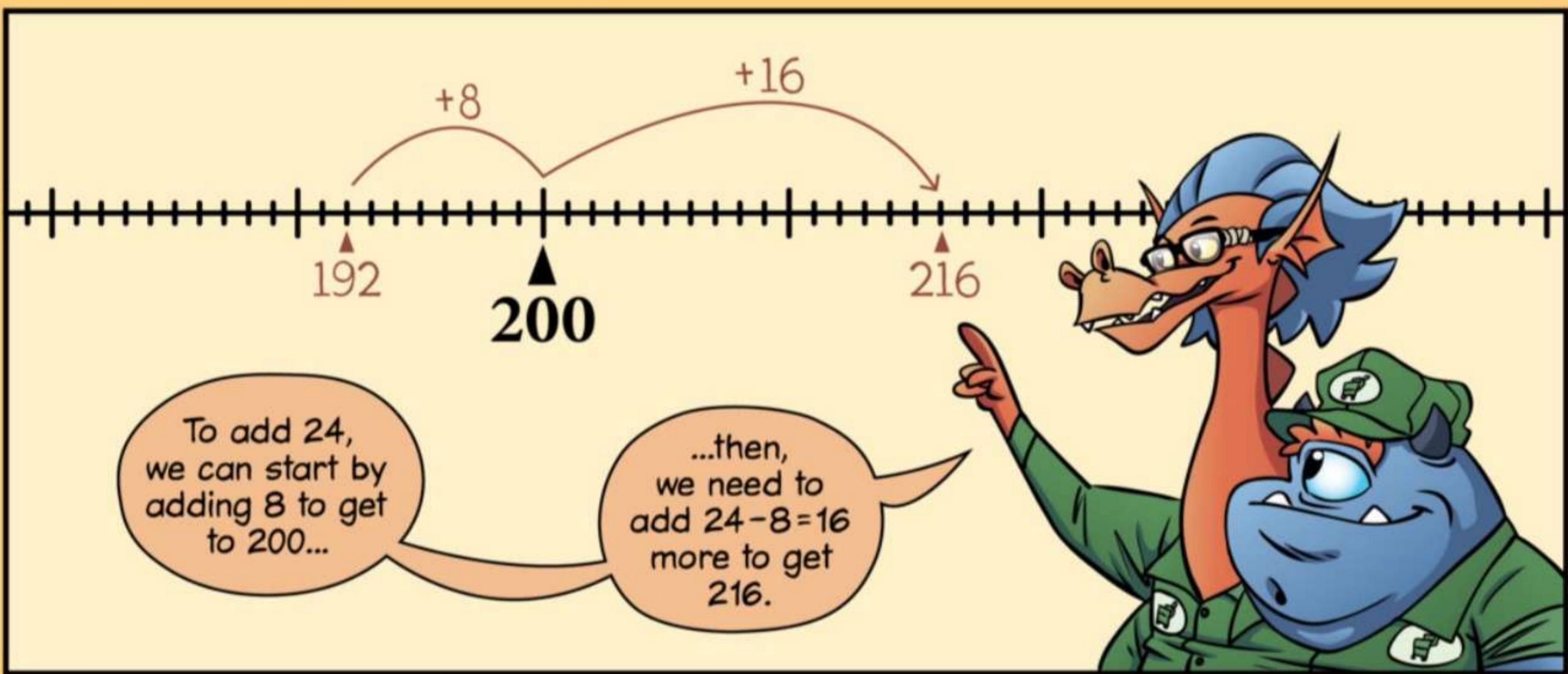
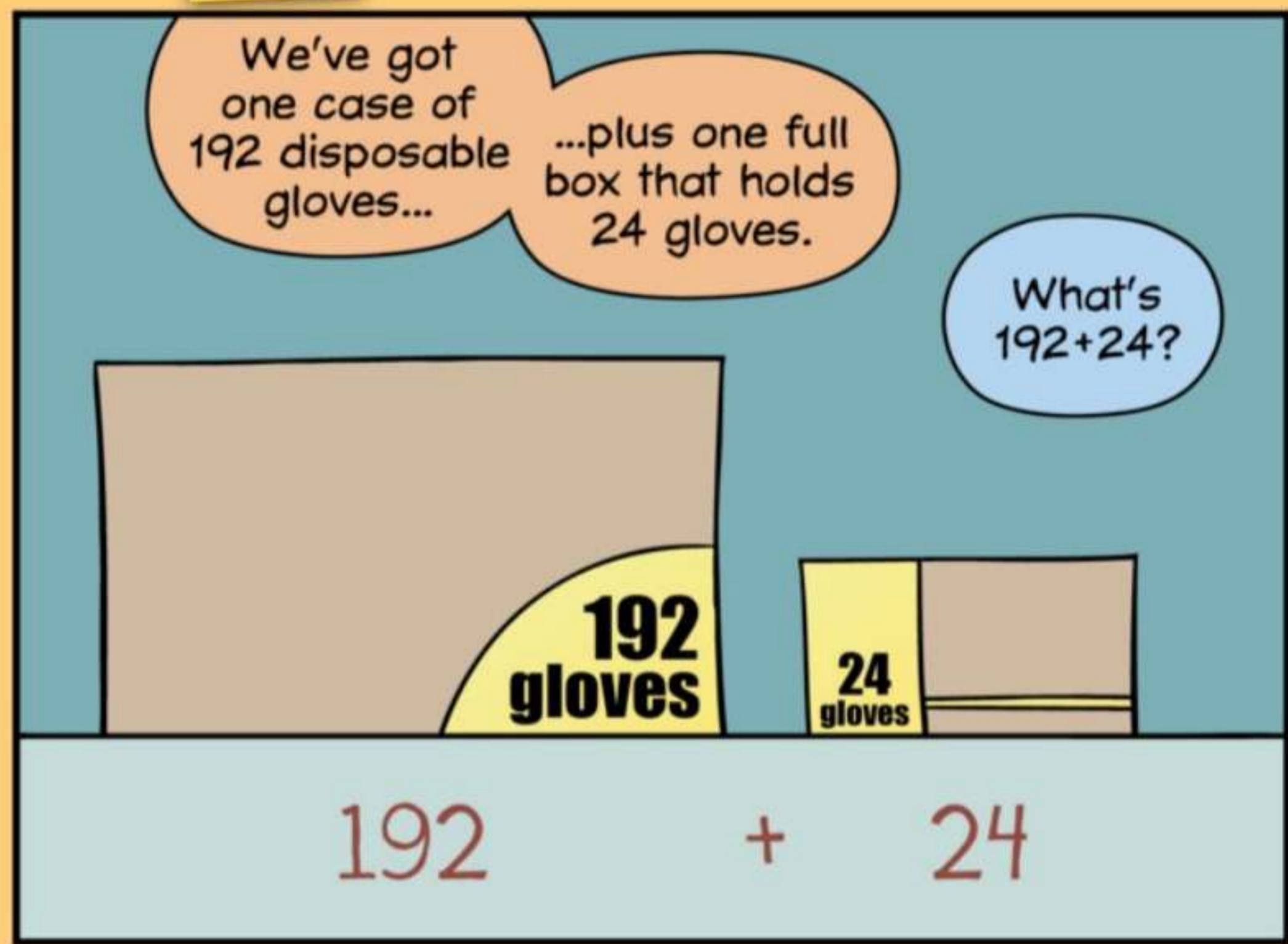


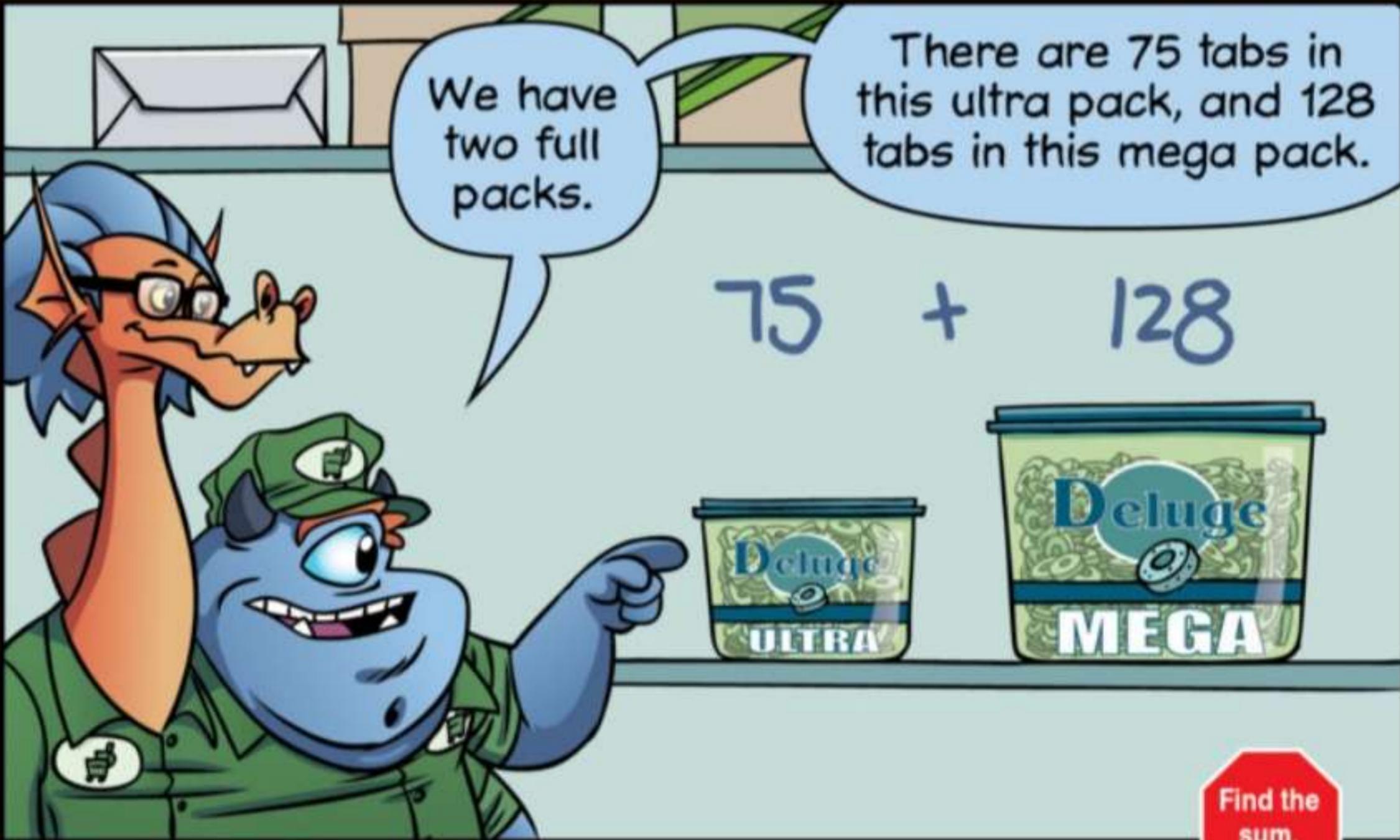
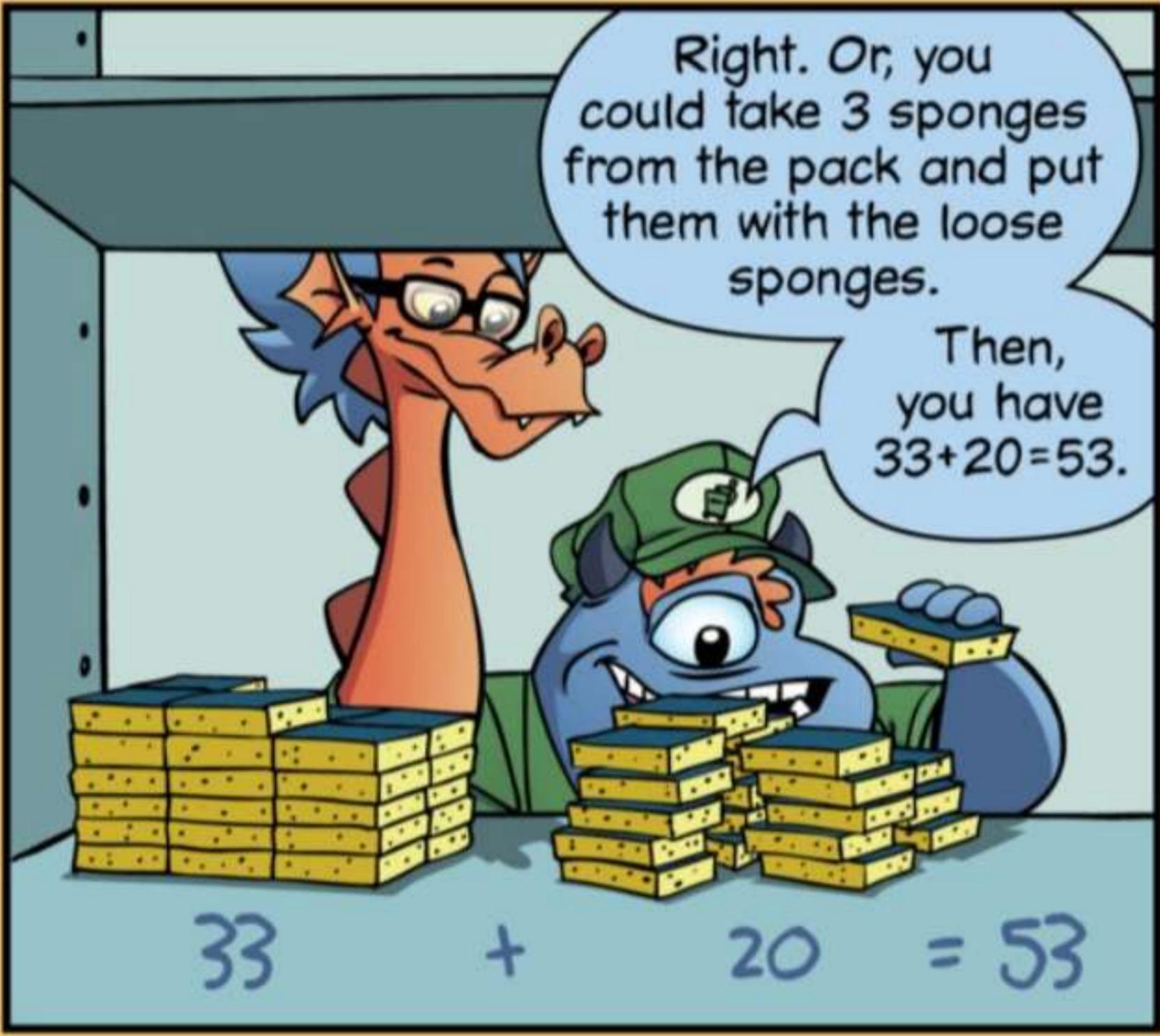
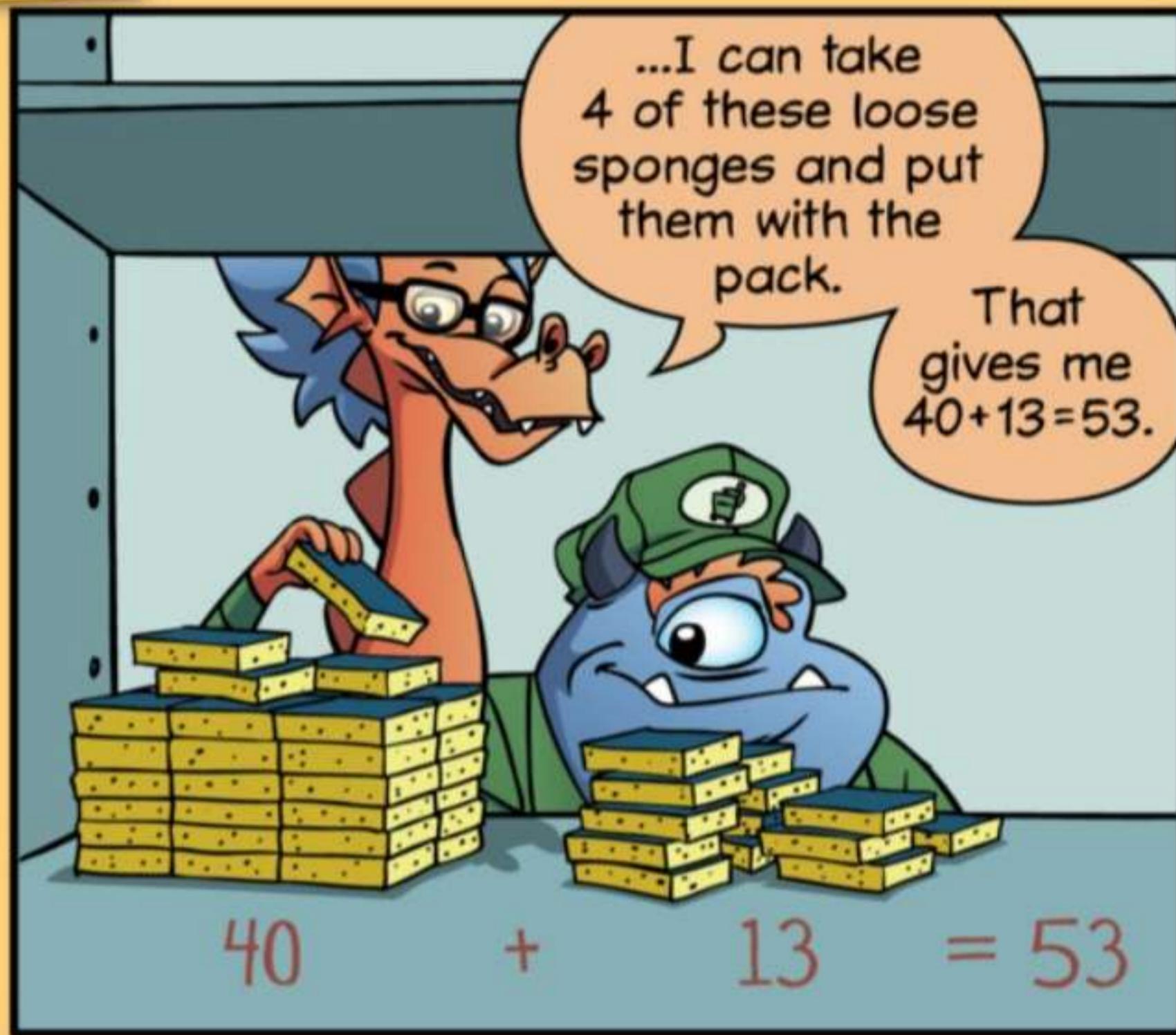




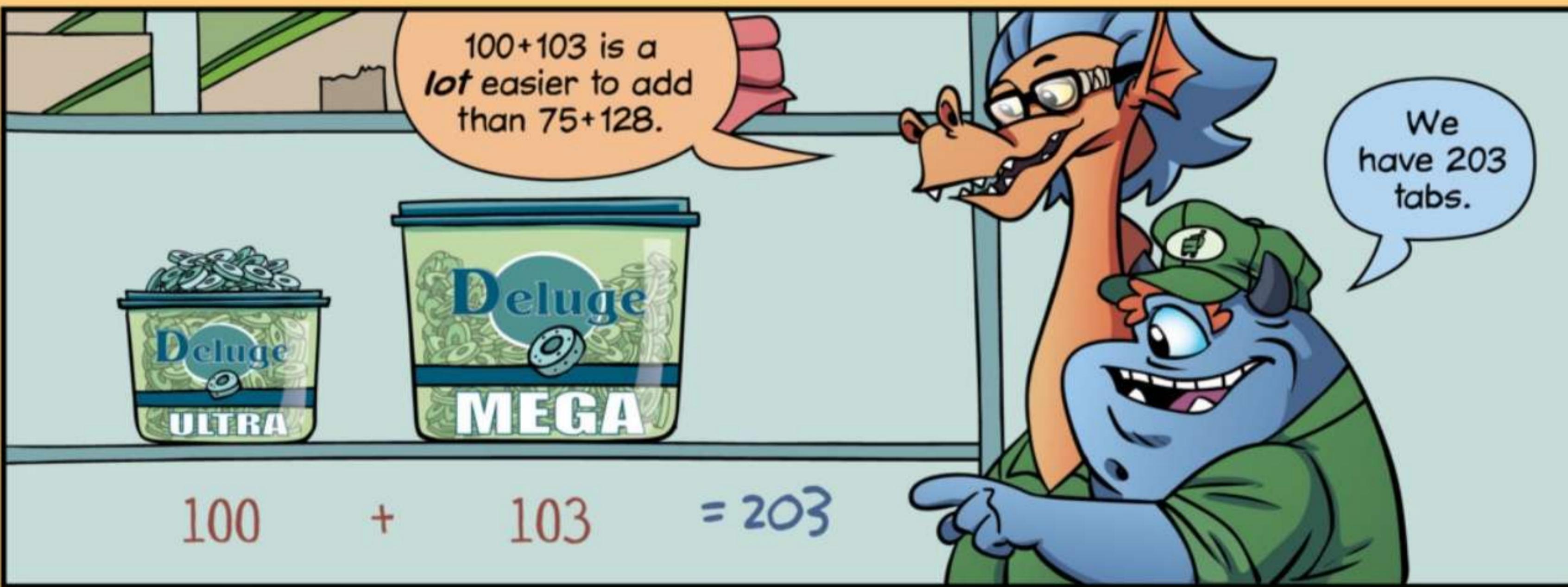
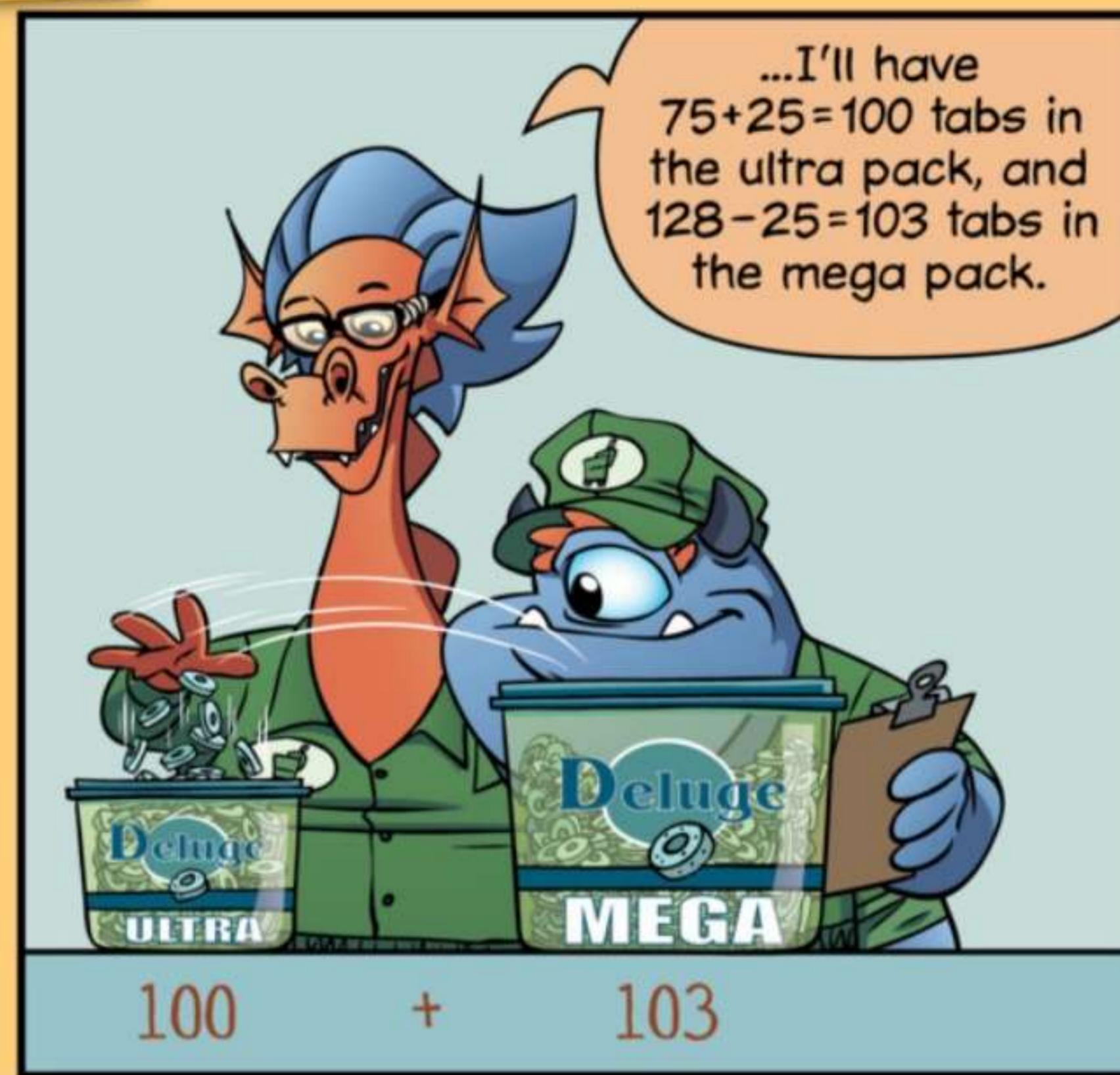
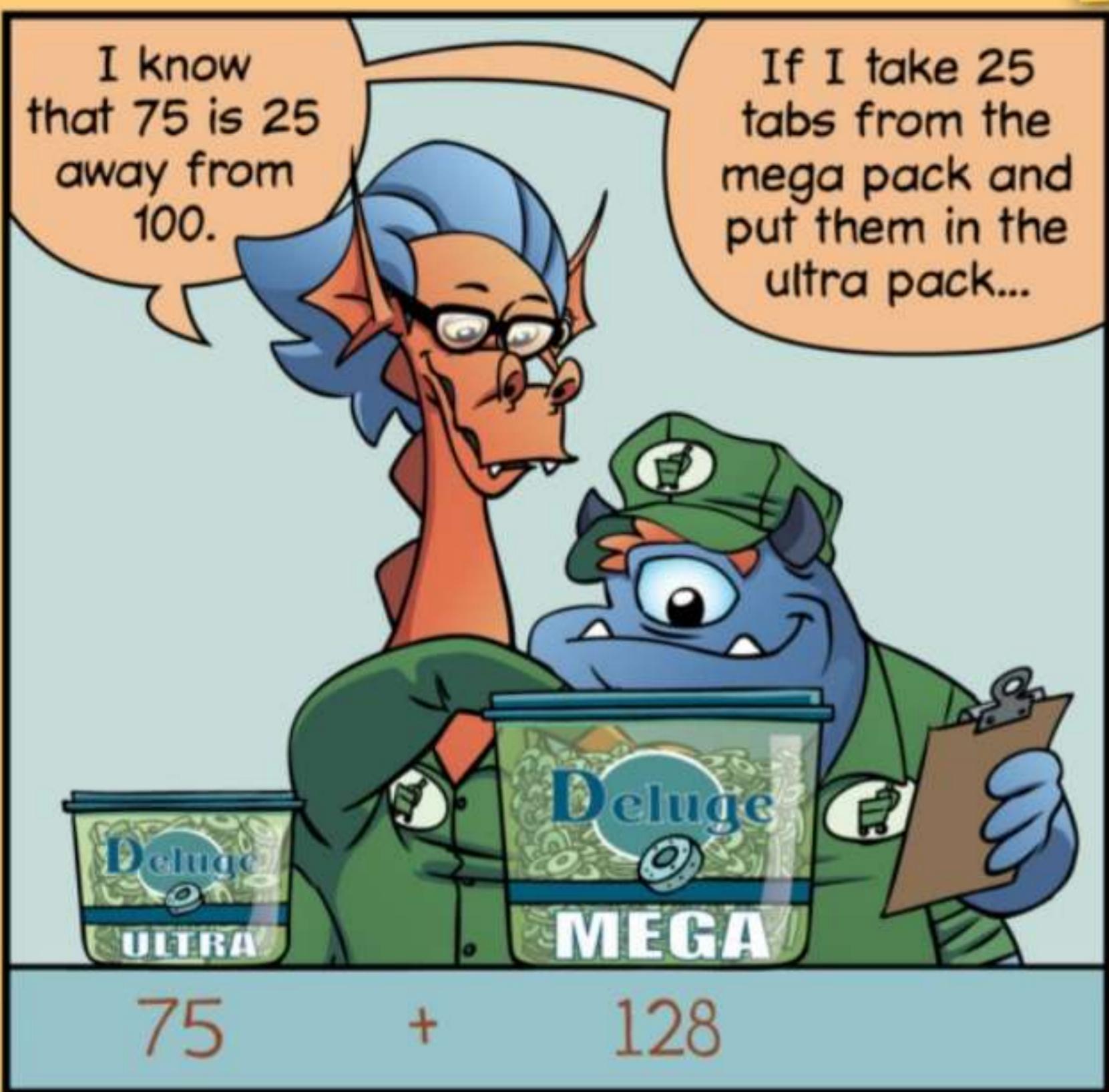








Find the sum.





**Ms.  
Q**  
A Little  
Extra

Did anyone else bring in cans for the food drive?



We have 29 cans to add to the 53 cans we collected last week.

What are some ways to add  $53+29$ ?

$$53 + 29$$



We can add up the tens and add up the ones.

$53+29$  gives us 7 tens and 12 ones.

And  $70+12=82$ .

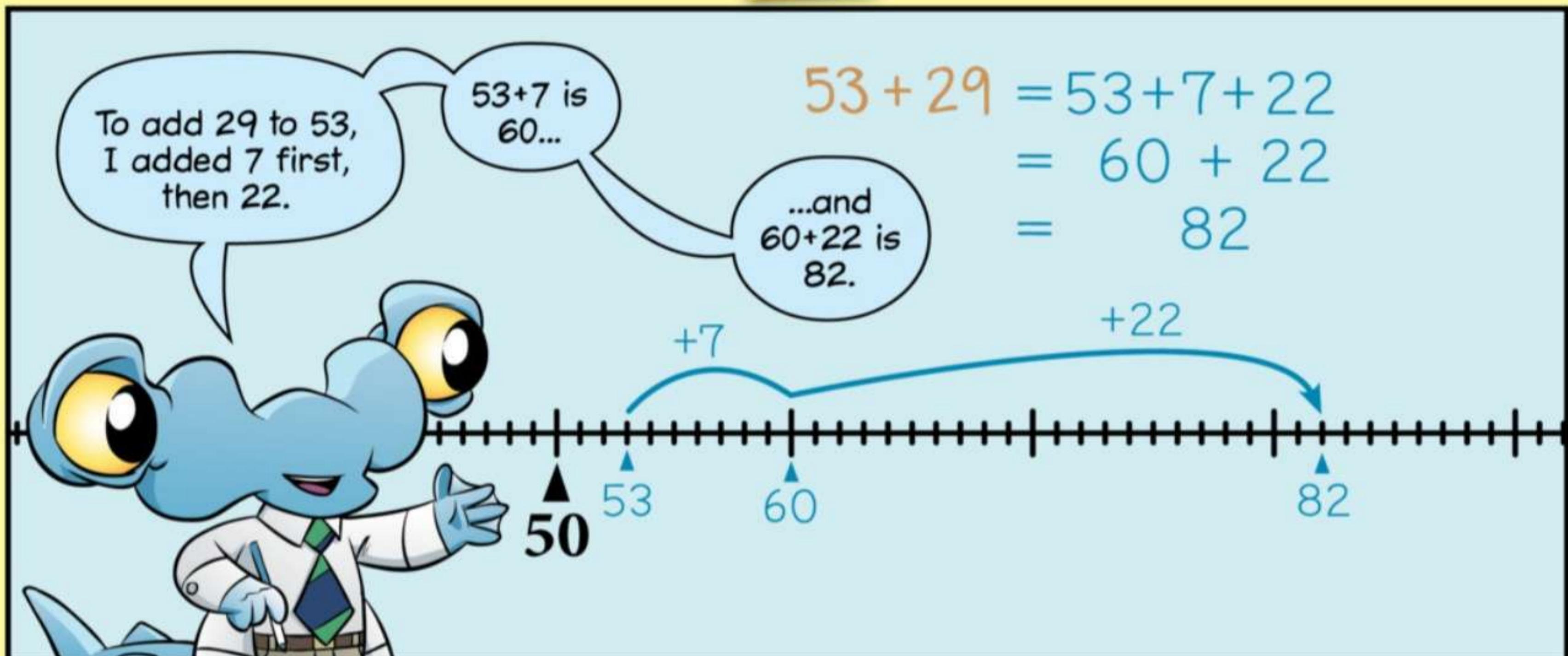
$$5 \text{ tens} + 2 \text{ tens} = 7 \text{ tens}$$

$$53 + 29 = 70 + 12 = 82$$

$$3 \text{ ones} + 9 \text{ ones} = 12 \text{ ones}$$



How do you add  $53+29$ ?





$$\begin{aligned} 53 + 29 &= 53 + 30 - 1 \\ &= 83 - 1 \\ &= 82 \end{aligned}$$

So, to add  $53+29$ , we can start by adding  $53+30$  to get 83.

Then, we subtract 1 to get 82.



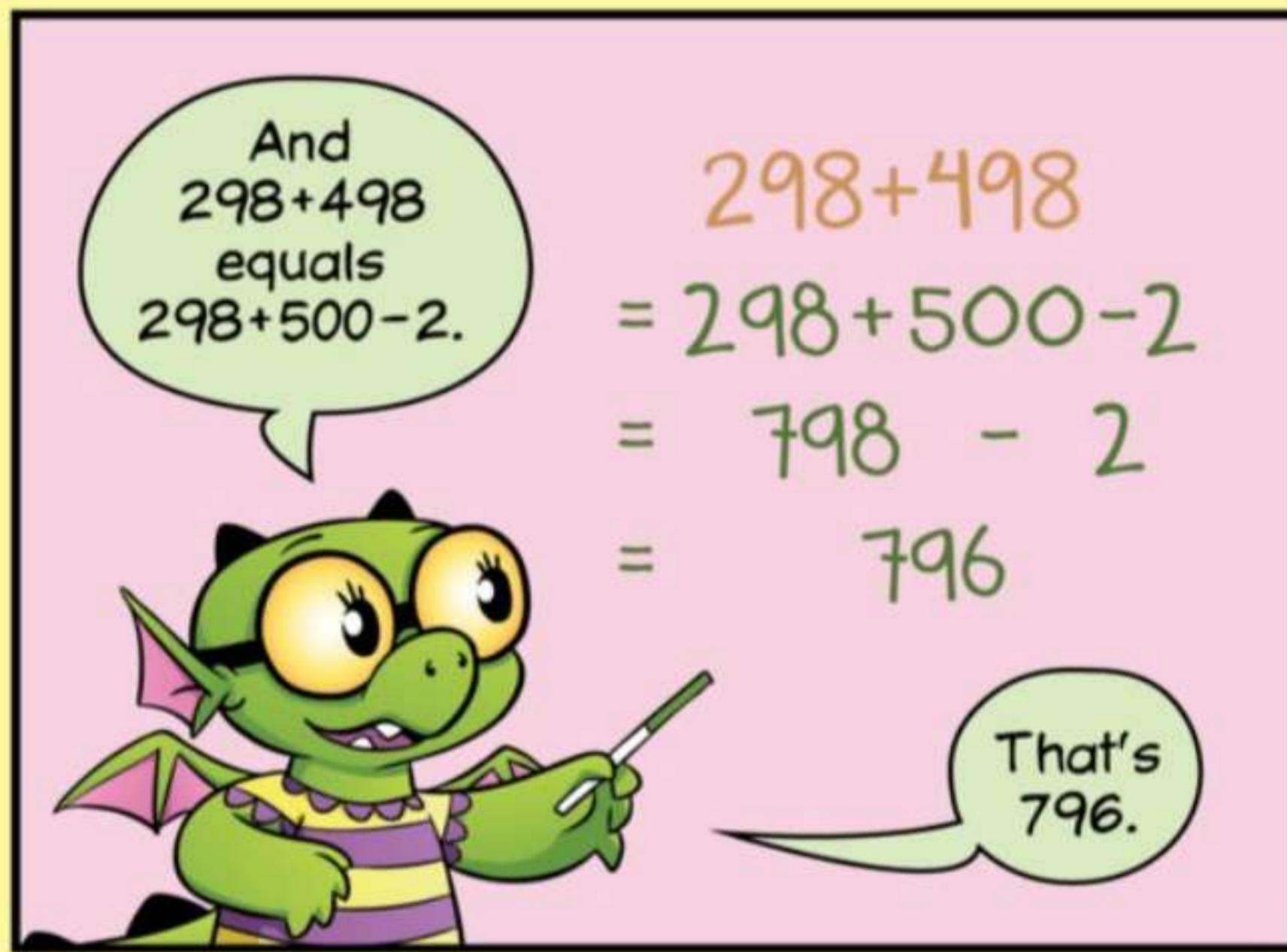
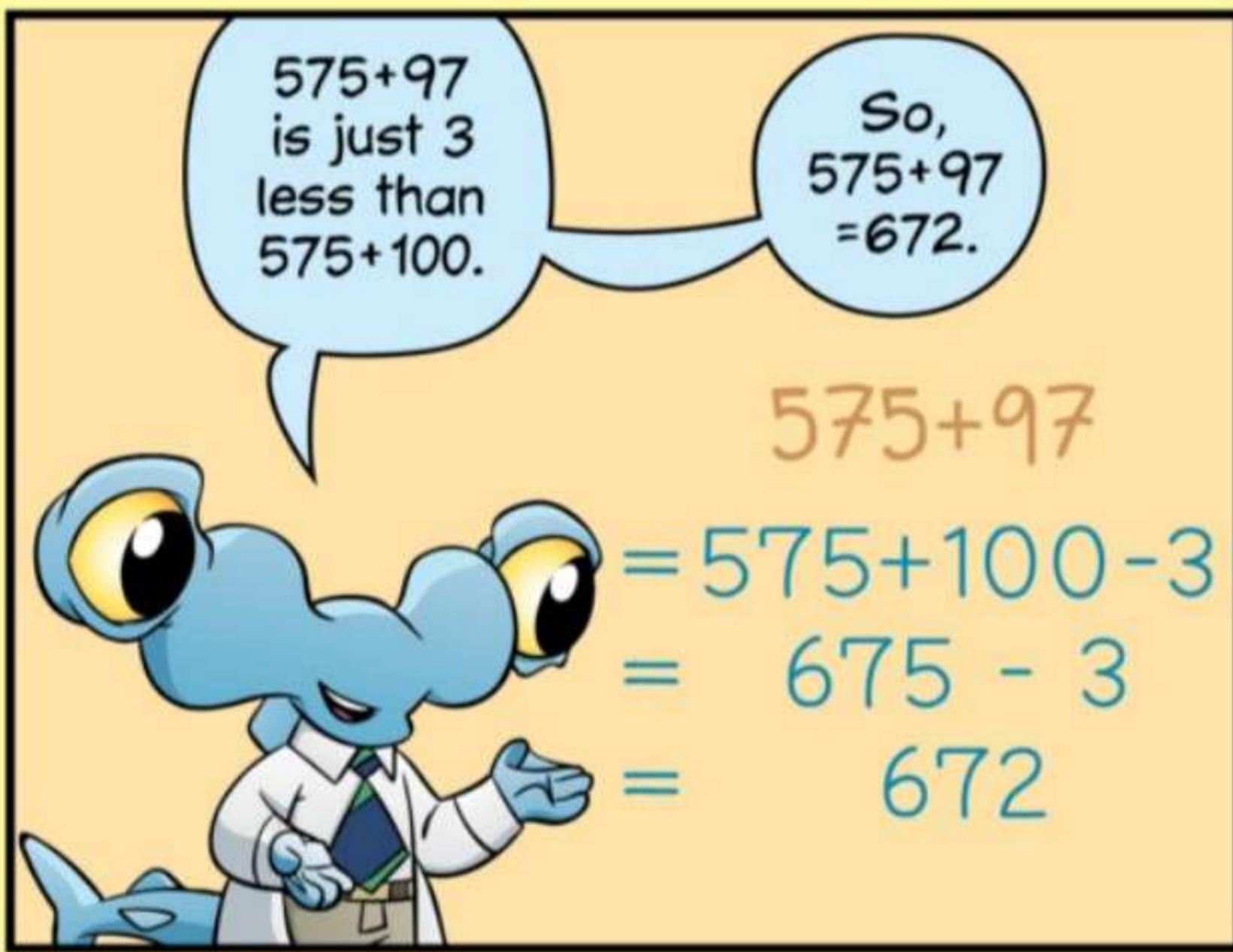
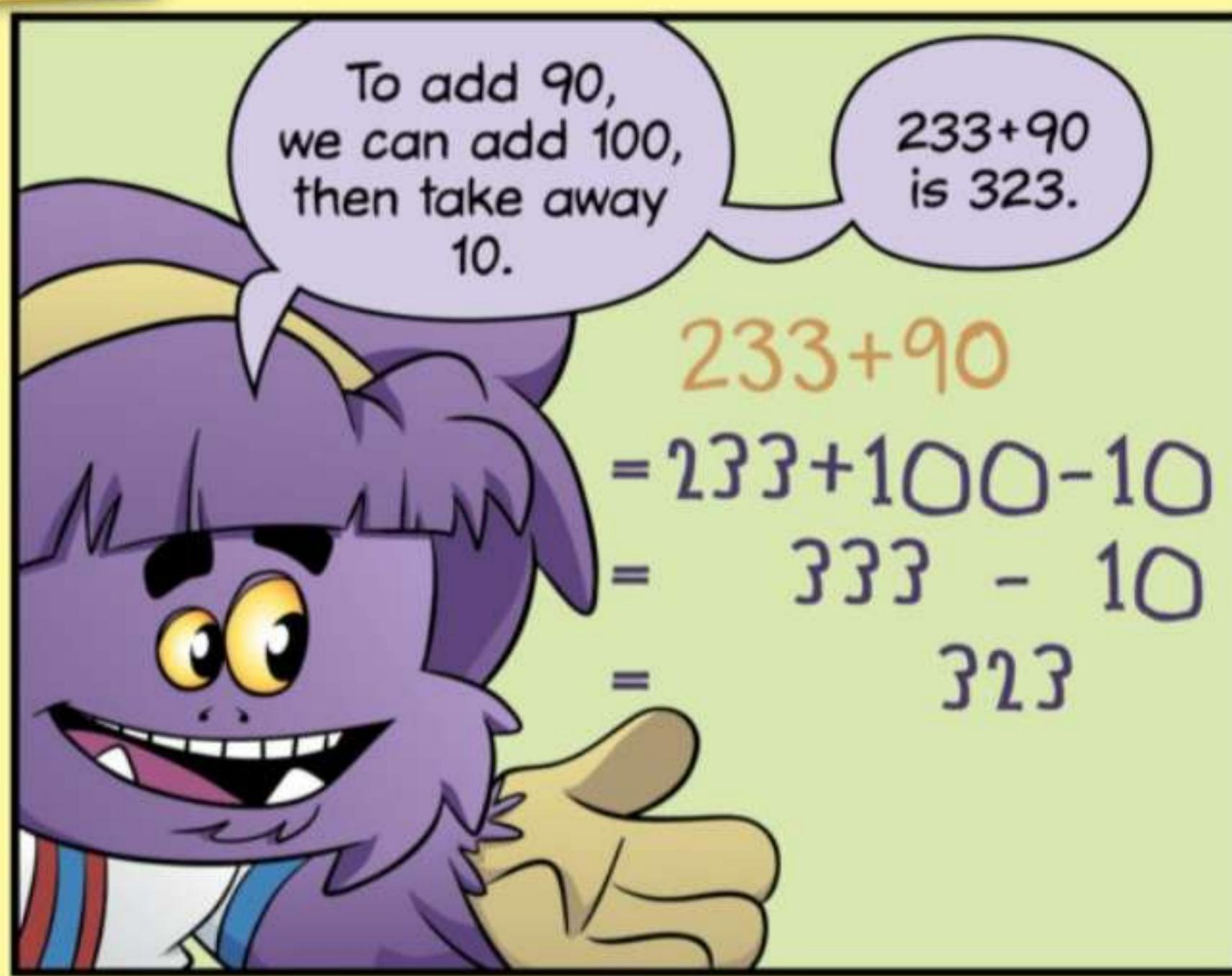
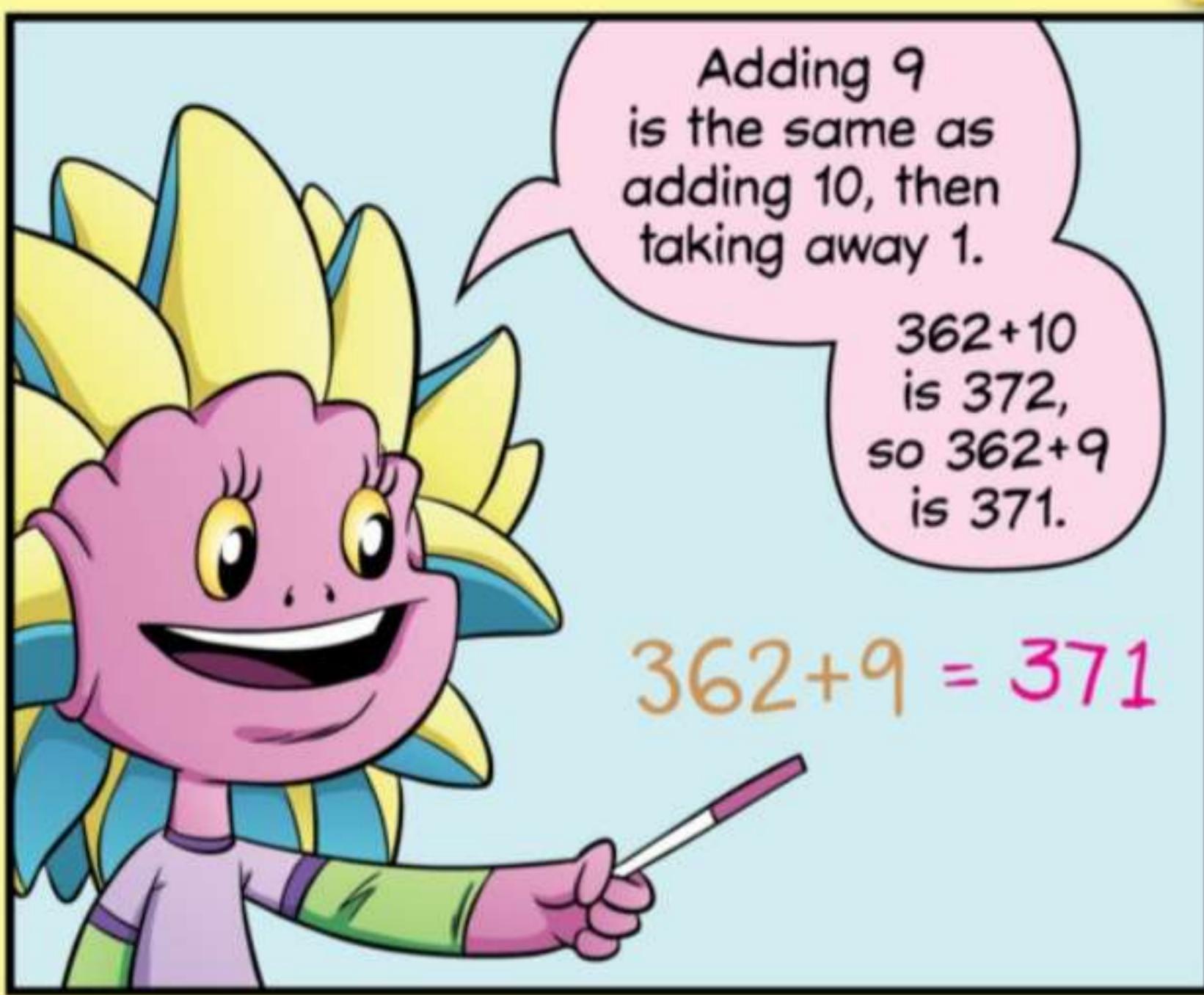
Excellent!  
Many addition problems are easier if you add a little extra...  
...then take it away.

$$\begin{aligned} 362 + 9 \\ 233 + 90 \\ 575 + 97 \\ 298 + 498 \end{aligned}$$

How could you use this strategy to find each of these sums?

Try all four.





Since 298 is 2 less than 300, and 498 is 2 less than 500...

... $298+498$  is 4 less than  $300+500$ .

So, to add  $298+498$ , we can add  $300+500$ , then take away 4!

$800-4 = 796$ .

$$298+498$$

$$\begin{aligned} &= 300+500-4 \\ &= 800 - 4 \\ &= 796 \end{aligned}$$



Well done.  
You can increase  
both numbers in a  
sum to make them  
easier to add...

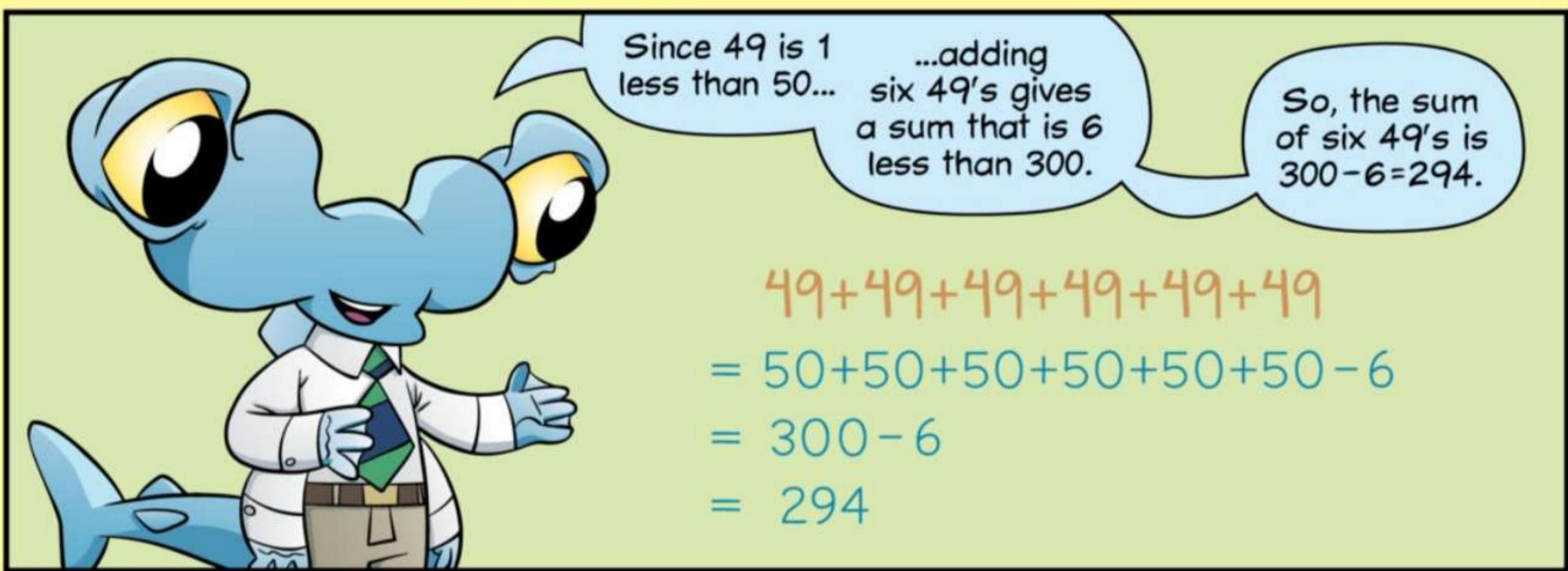
...then take  
away the  
extra. This can be  
really helpful when  
adding more than  
two numbers.

$$49+49+49+49+49+49$$

How could  
this strategy  
help you add  
six 49's?



Try it.



# MATH TEAM

## Rearranging

There are 17 red bots

and 14 blue bots on the

table. How many

bots are there  
all together?



17+14  
is 31.

Hmmm...  
I added 14+17  
and got the same  
answer.

$$17+14=31$$

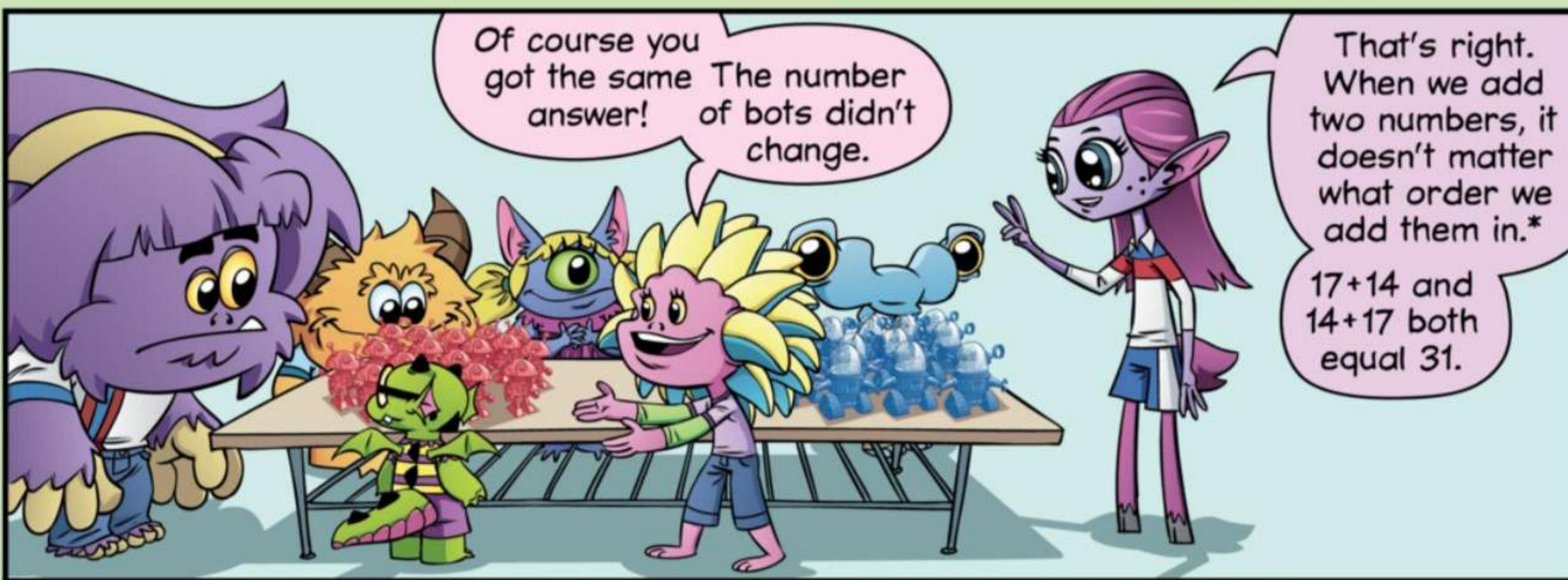
$$14+17=31$$



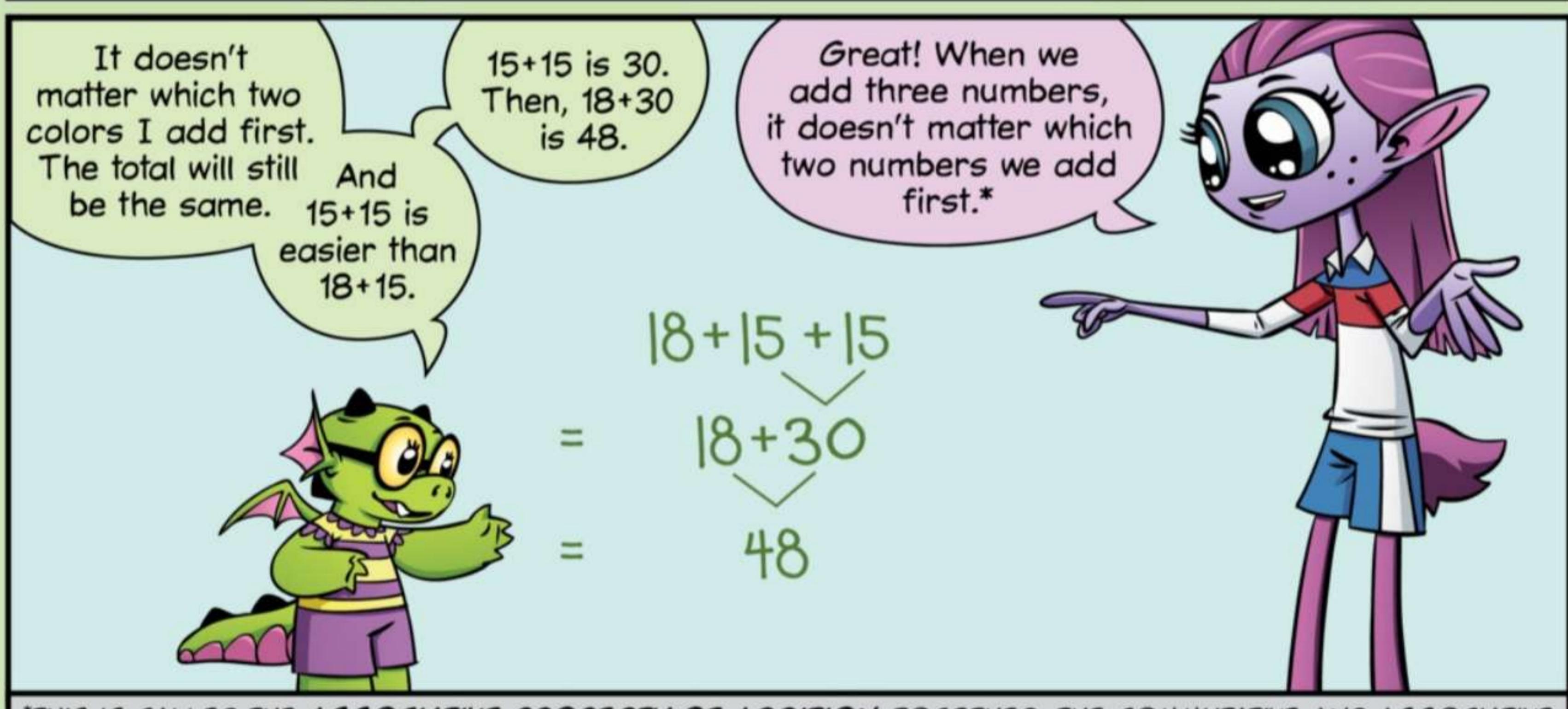
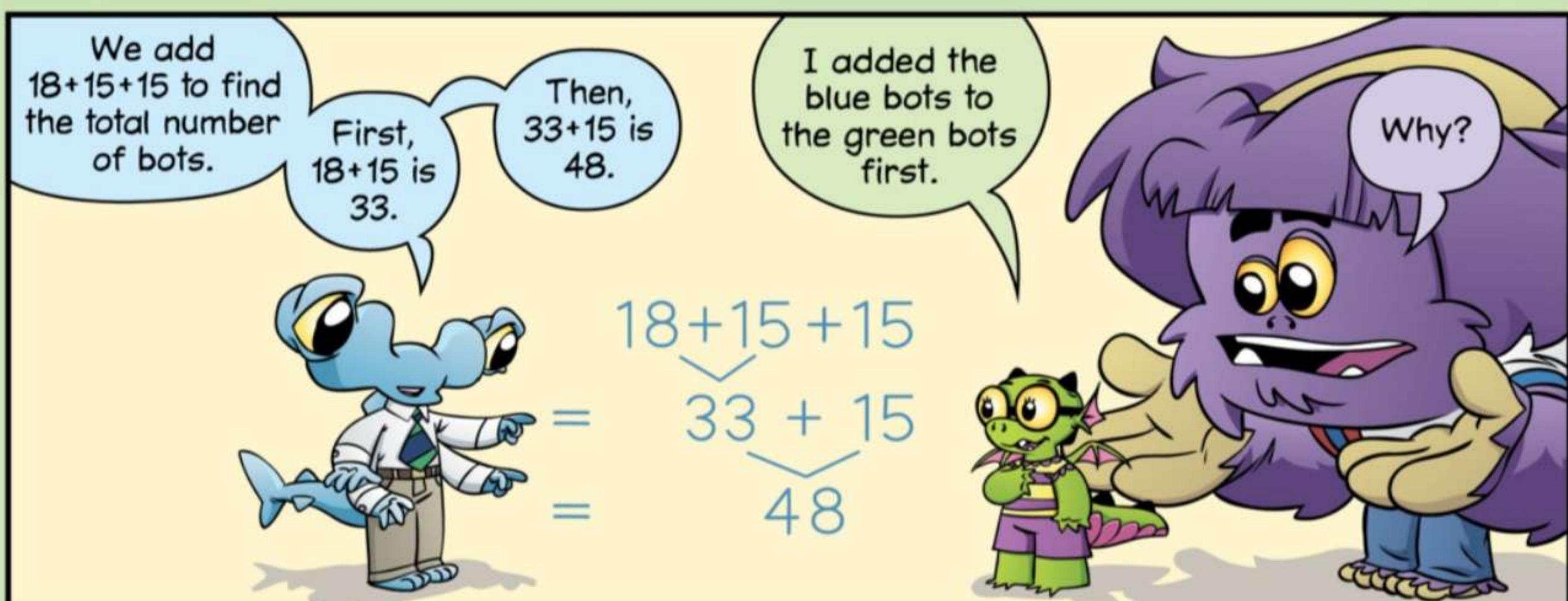
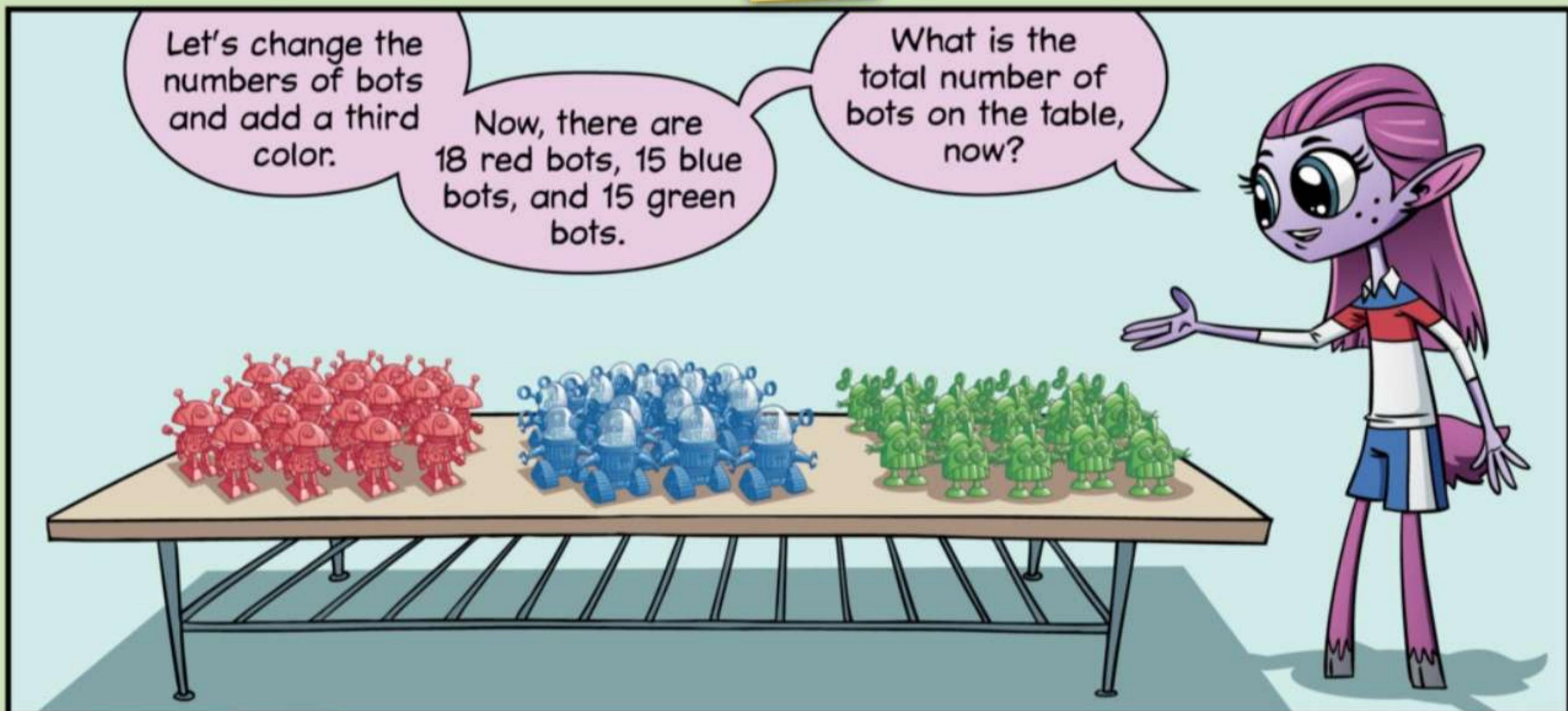
Of course you  
got the same answer! The number  
of bots didn't change.

That's right.  
When we add  
two numbers, it  
doesn't matter  
what order we  
add them in.\*

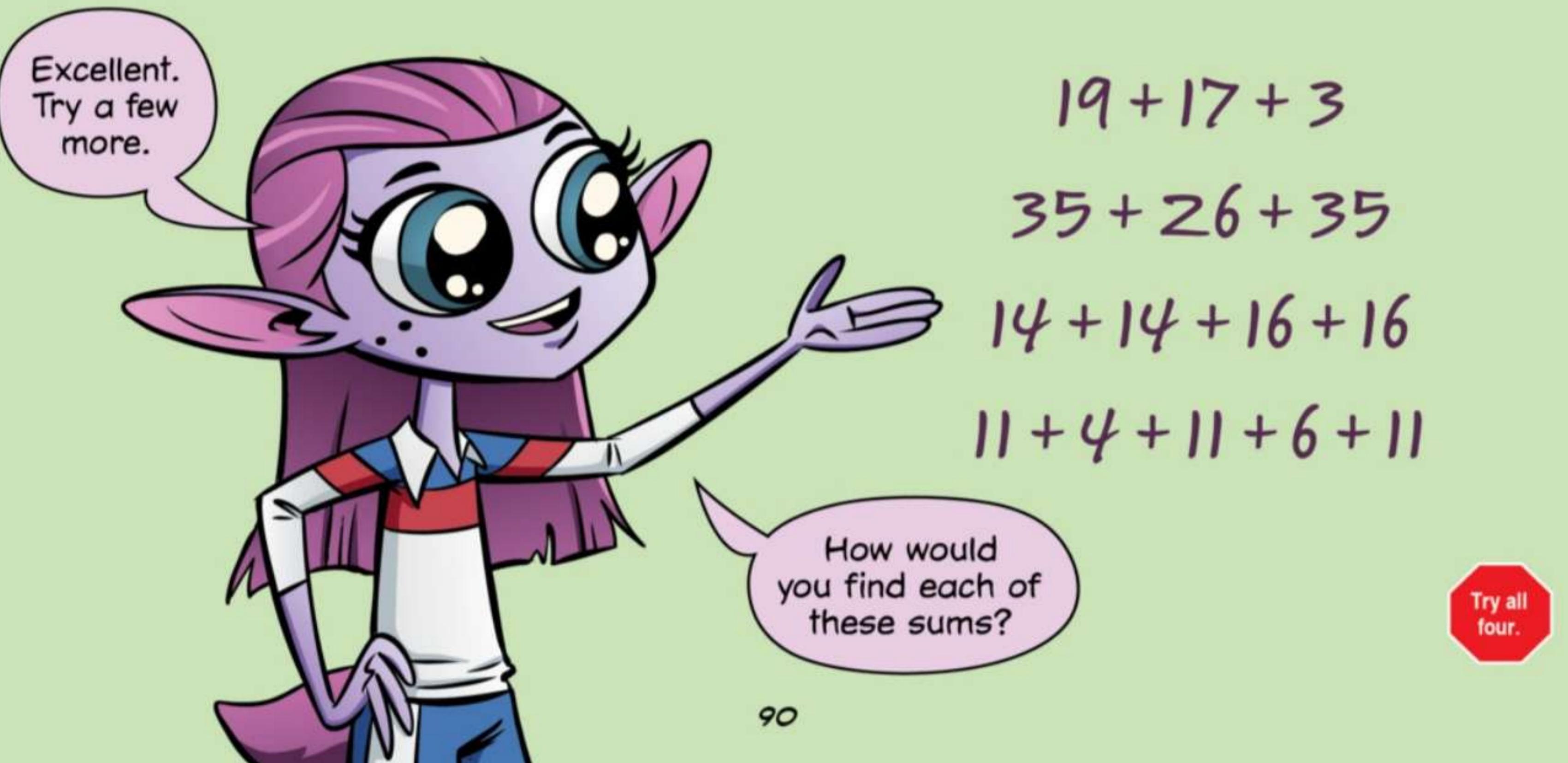
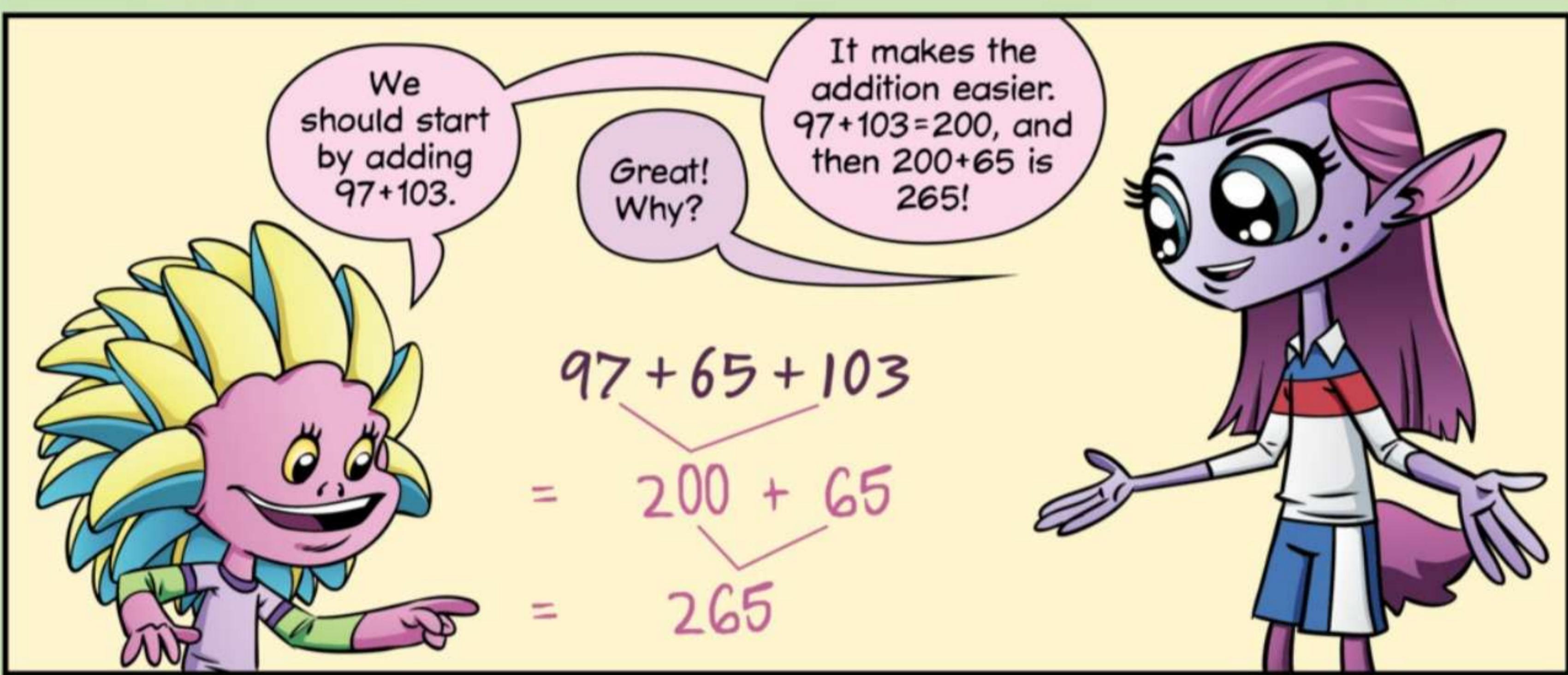
17+14 and  
14+17 both  
equal 31.



\*MATH BEASTS CALL THIS THE COMMUTATIVE PROPERTY OF ADDITION.  
YOU DON'T NEED TO REMEMBER WHAT IT'S CALLED TO KNOW THAT IT WORKS.



\*THIS IS CALLED THE ASSOCIATIVE PROPERTY OF ADDITION. TOGETHER, THE COMMUTATIVE AND ASSOCIATIVE PROPERTIES OF ADDITION LET US ADD NUMBERS IN ANY ORDER WE WANT.



19+17+3 is easiest if you add 17+3 first to get 20.

$$\begin{aligned} & 19 + 17 + 3 \\ &= 19 + \cancel{17} + 3 \\ &= 19 + 20 \\ &= 39 \end{aligned}$$



Then, 19+20 is 39.

For this one, I added the 35's first to get 70.

$$\begin{aligned} & 35 + 26 + 35 \\ &= 70 + \cancel{26} + 35 \\ &= 70 + 35 \\ &= 96 \end{aligned}$$



And 70+26 is 96.

We can pair each 14 with a 16 to get 30+30...

$$\begin{aligned} & 14 + 14 + 16 + 16 \\ &= \cancel{14} + \cancel{14} + 16 + 16 \\ &= 30 + 30 \\ &= 60 \end{aligned}$$



...which is 60!

Here, I added 11+11+11=33, and 4+6=10.

$$\begin{aligned} & 11 + 4 + 11 + 6 + 11 \\ &= \cancel{11} + \cancel{11} + \cancel{11} + 4 + 6 \\ &= 33 + 10 \\ &= 43 \end{aligned}$$



So, the total is 33+10=43.

$$6 + 7 + 8 + 9 + 10 + 11 + 12 + 13 + 14$$

$$99 + 10 + 99 + 20 + 99 + 30 + 99 + 40$$

Great work!

I've got two more, but they're tough.

How could you find each of these sums?



Try them!

$$6+7+8+9+10+11+12+13+14 = 20$$



For this one, we can pair 6 with 14 to make 20.

$$6+7+8+9+10+11+12+13+14 = 20 + 20$$



We can pair the 7 with 13 to make 20, too.

$$6+7+8+9+10+11+12+13+14 = 20 + 20 + 20$$



8+12 is 20.

$$6+7+8+9+10+11+12+13+14 = 20 + 20 + 20 + 20 + 10$$



So is 9+11.  
The only number without a partner is 10.

So, we get  
 $20+20+20+20+10 = 90$ .



$$6+7+8+9+10+11+12+13+14 = 20 + 20 + 20 + 20 + 10 = 90$$



For this one, we can start by adding all of the numbers that end in 0.

$10+20+30+40$  is 100.

Then, we add four 99's to that.

$$99+\textcircled{10}+99+\textcircled{20}+99+\textcircled{30}+99+\textcircled{40} = 100 + 99+99+99+99$$

Finish the sum.

Since 99  
is 1 less  
than 100...

...adding four  
99's is the same  
as adding four  
100's, then taking  
away 4.



$$99 + \textcircled{10} + 99 + \textcircled{20} + 99 + \textcircled{30} + 99 + \textcircled{40}$$

$$= 100 + 99 + 99 + 99 + 99$$

$$= 100 + 100 + 100 + 100 - 4$$

$$496$$

So, we get  
 $500 - 4 = 496$ .



Did you make all  
of these mini-bots,  
coach?

No, but some  
of my robotics  
classmates are  
building and  
programming  
math bots!

Cool!  
What  
for?



At the end  
of the semester,  
you guys will get to  
compete against  
them!

