

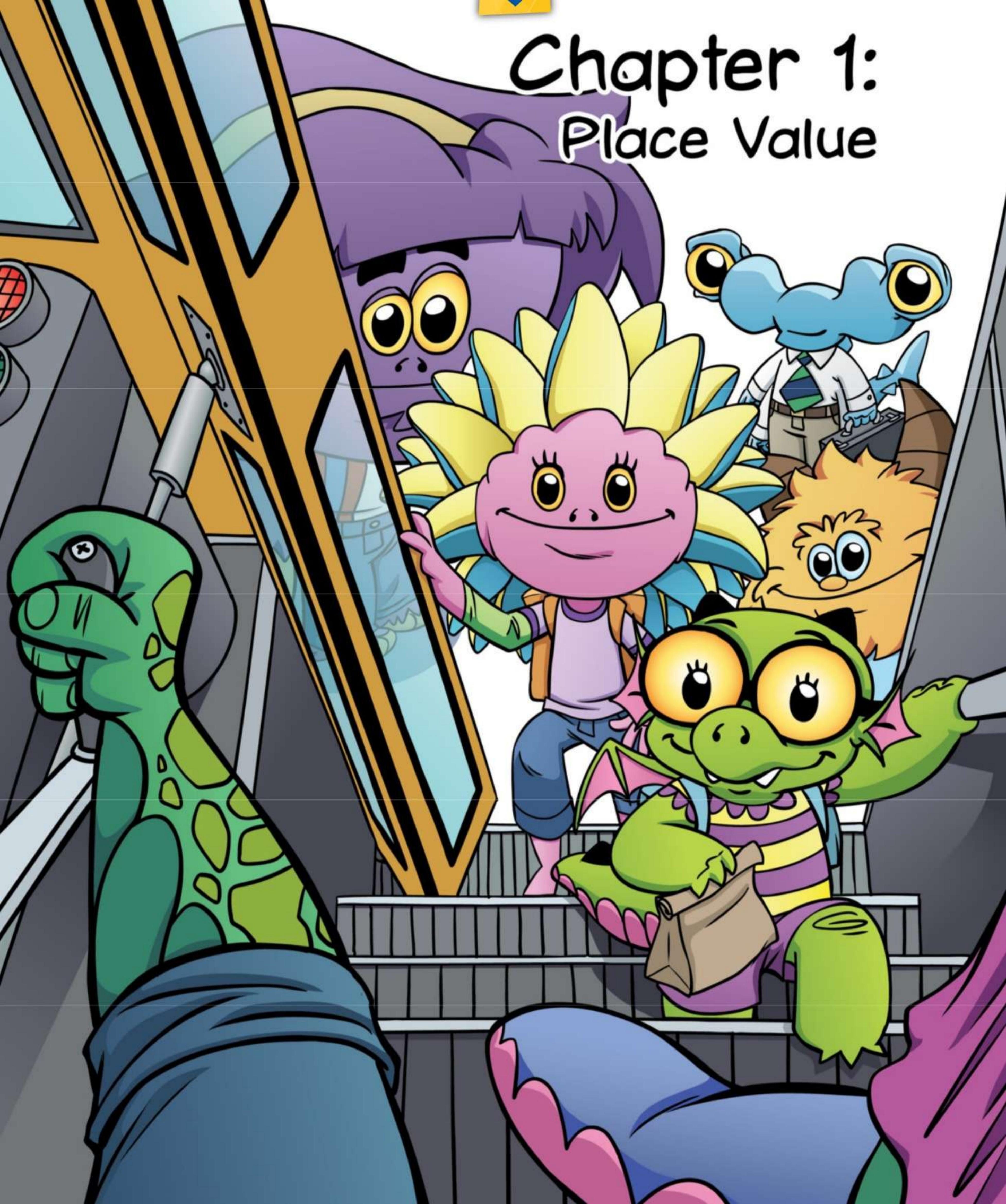
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Chapter 1:

Place Value



School Bus FIRST DAY



Can I
sit here?

Sure.

What's
that?

It's
my day
planner.

We have Woodshop
together today
at 10:15.

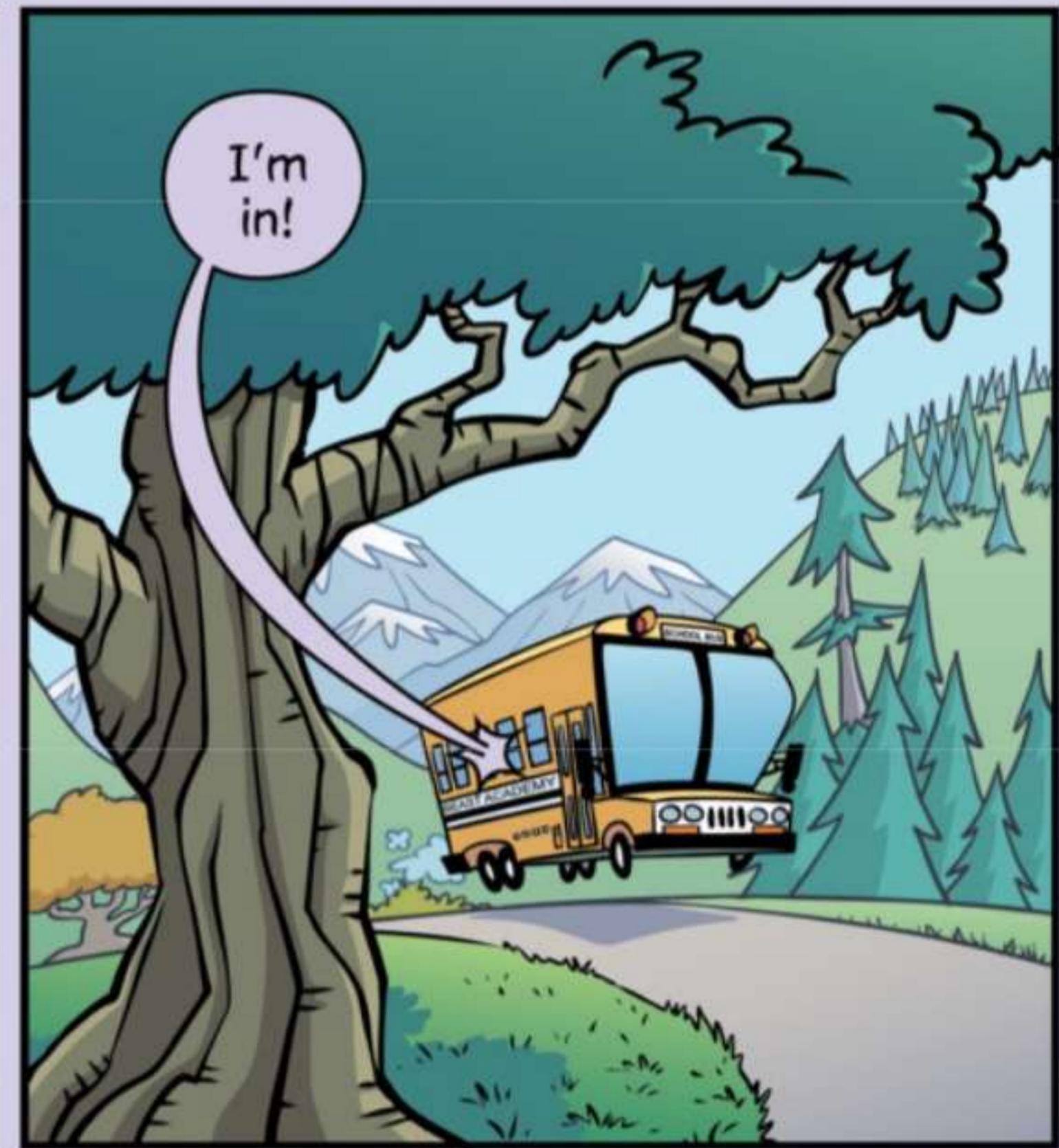
Yep.

Do
you think
Captain
Kraken is
really a
pirate?

Aye aye!

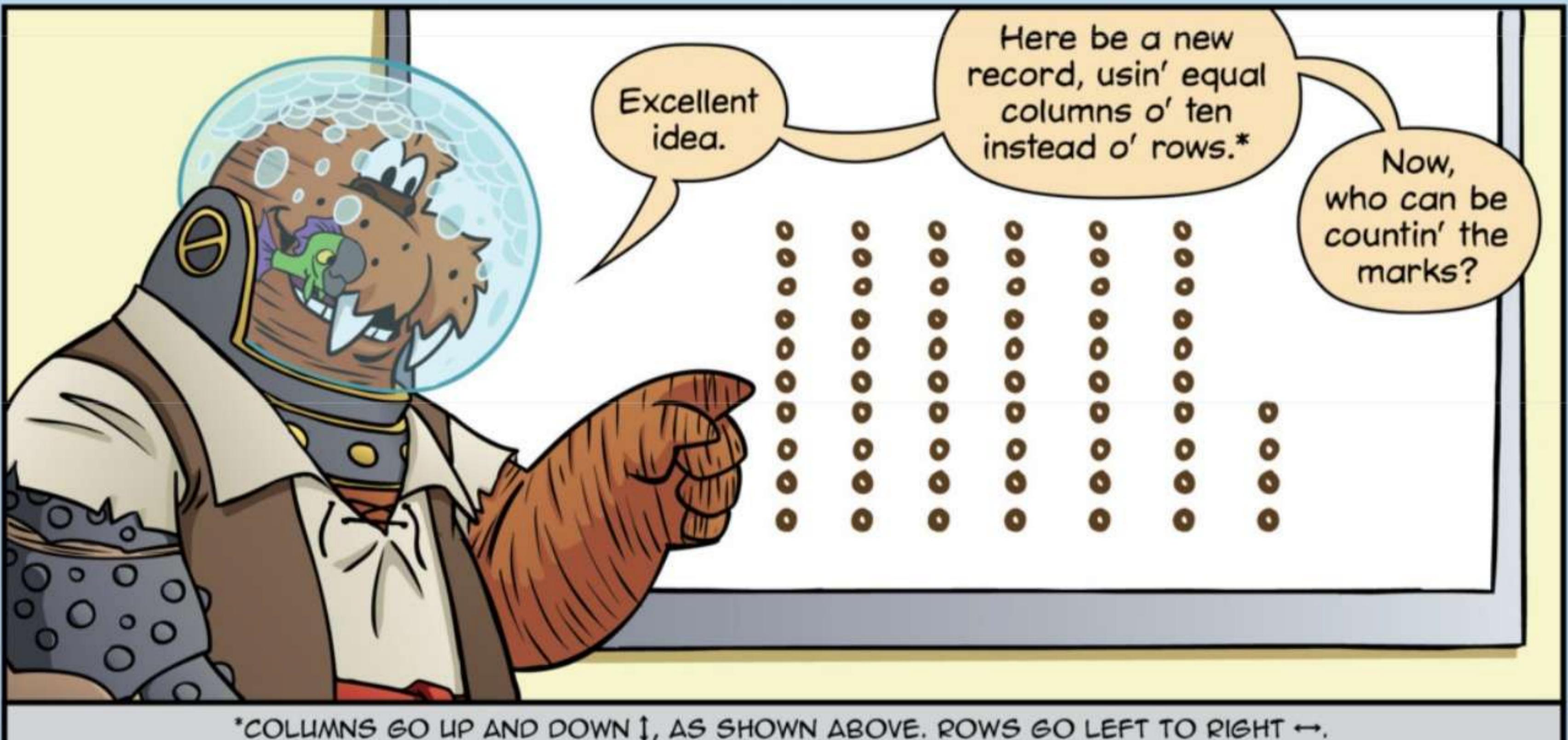
But,
I'm not
sure he's
a captain.



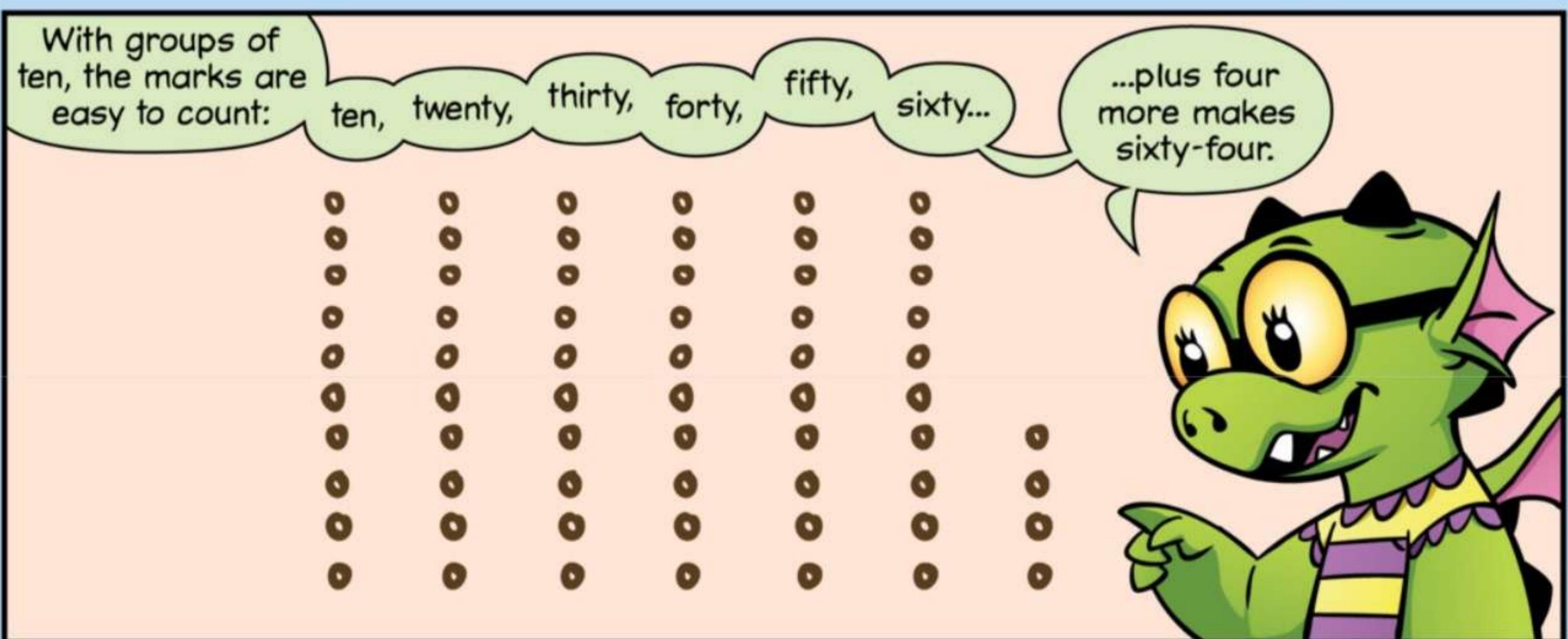


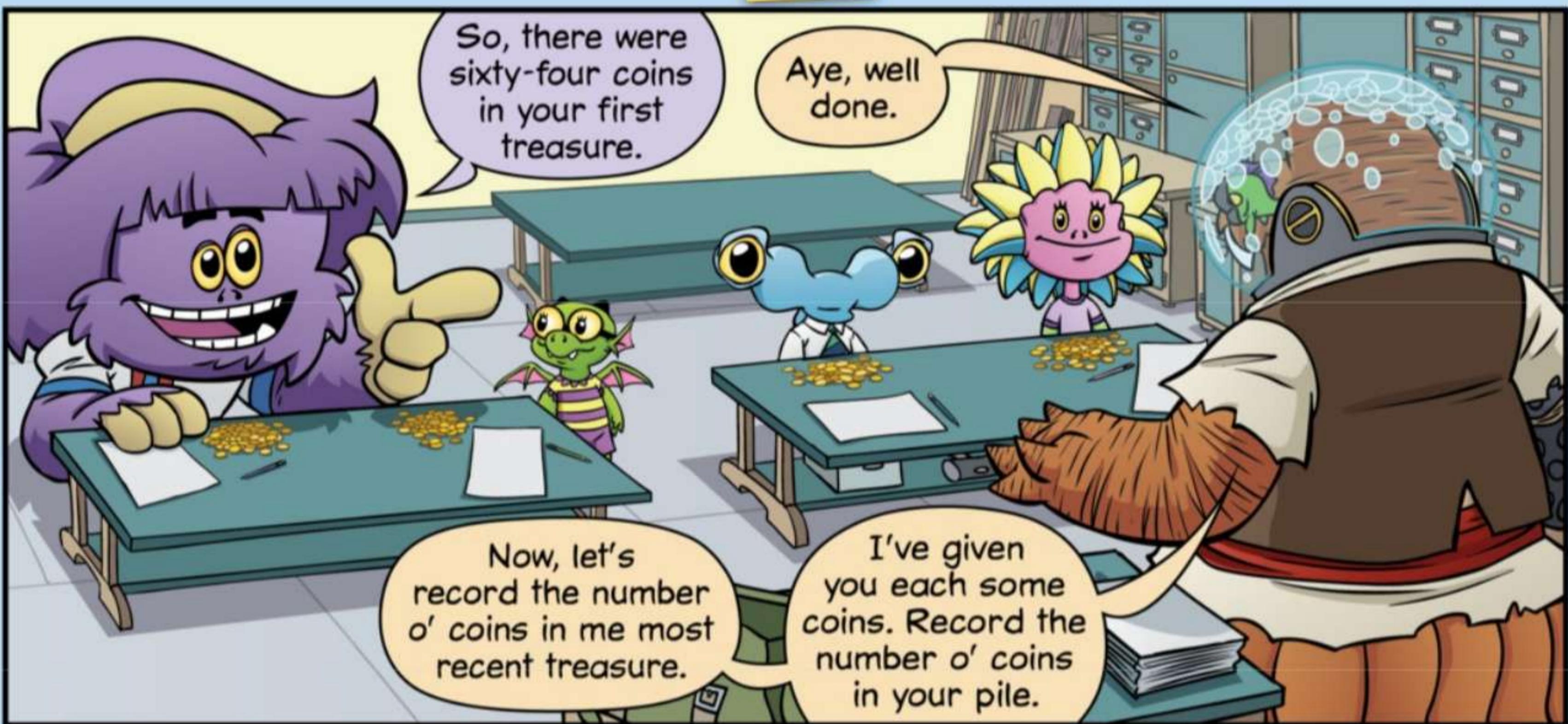


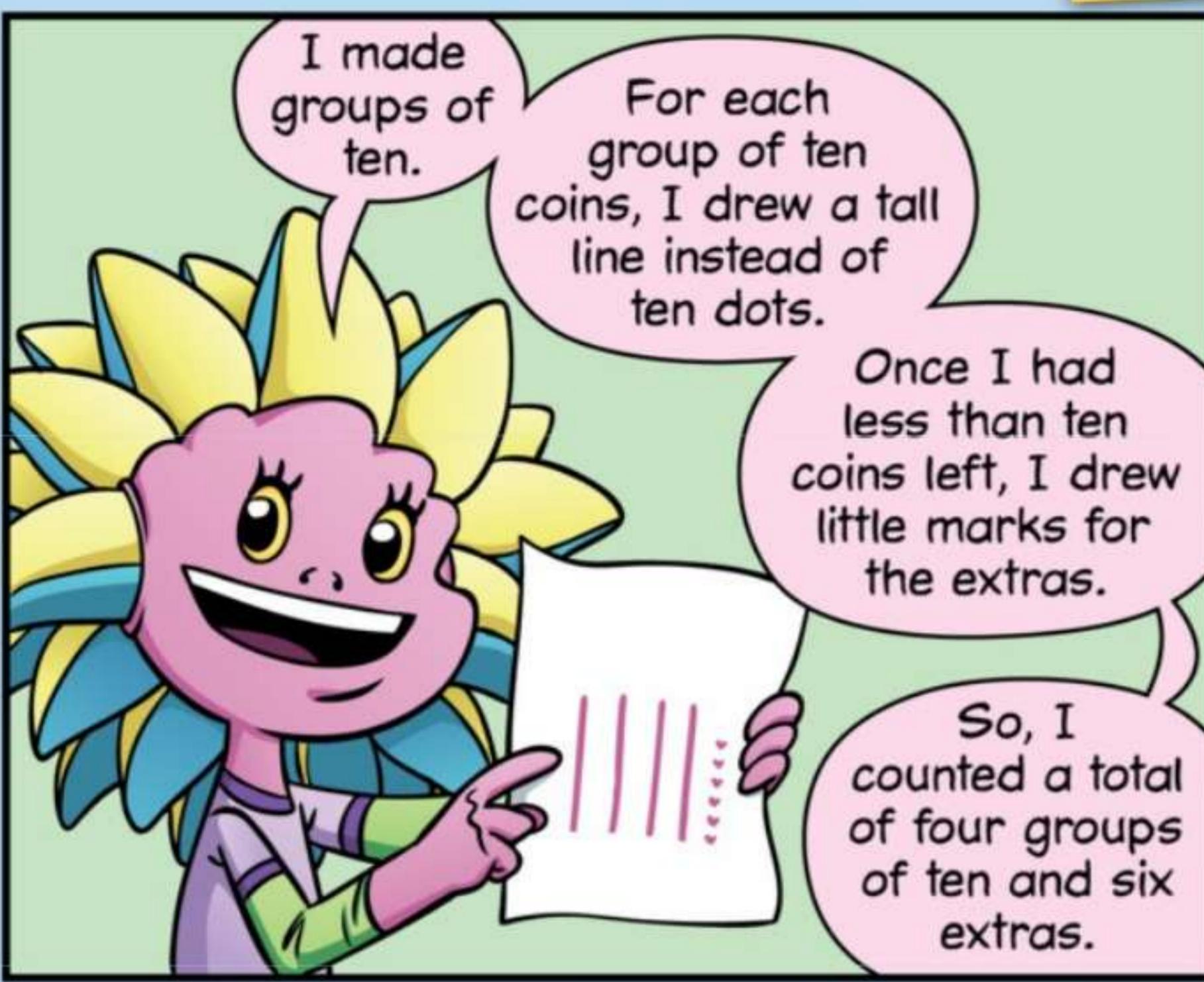


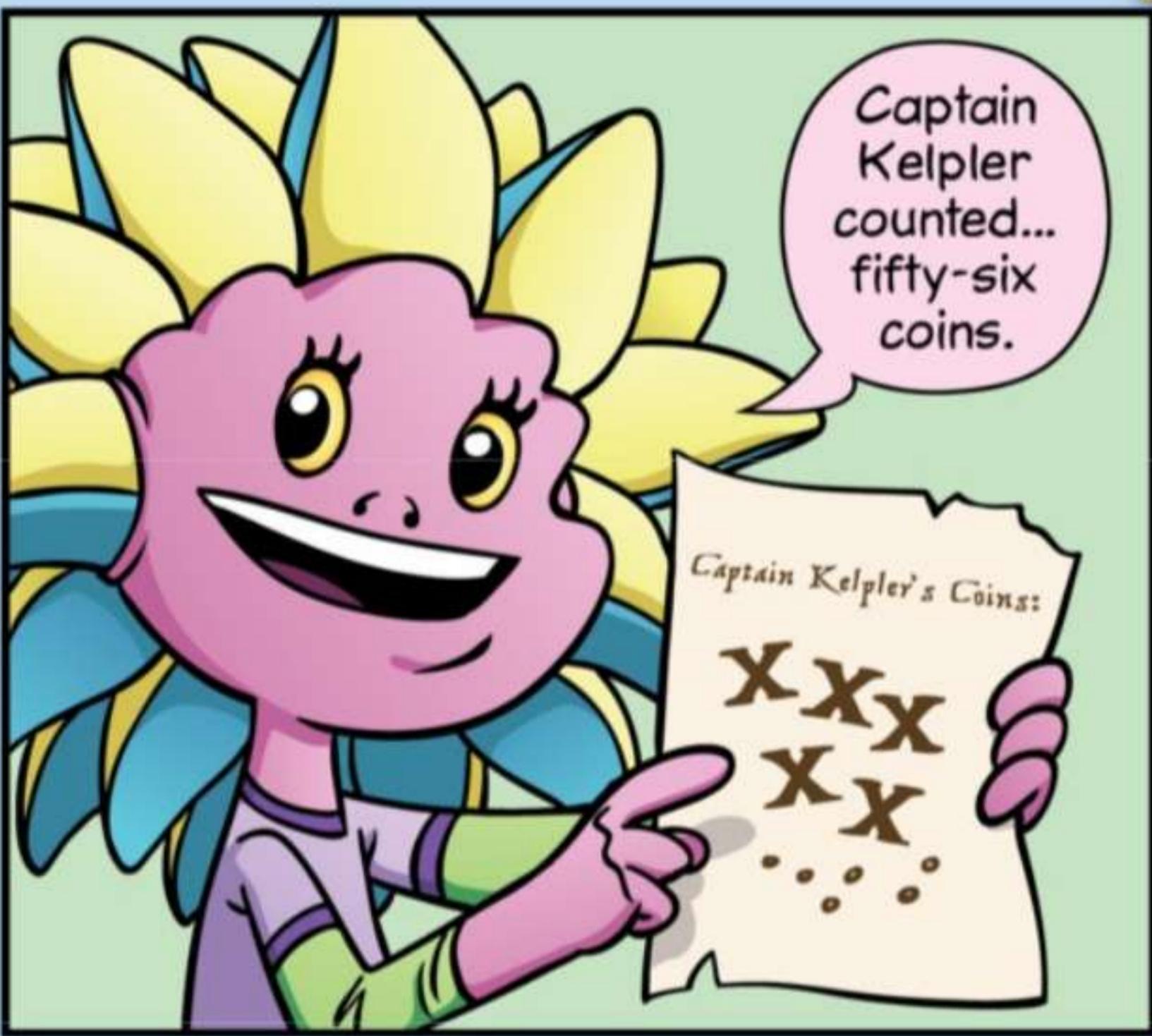


*COLUMNS GO UP AND DOWN ↑, AS SHOWN ABOVE. ROWS GO LEFT TO RIGHT ←.

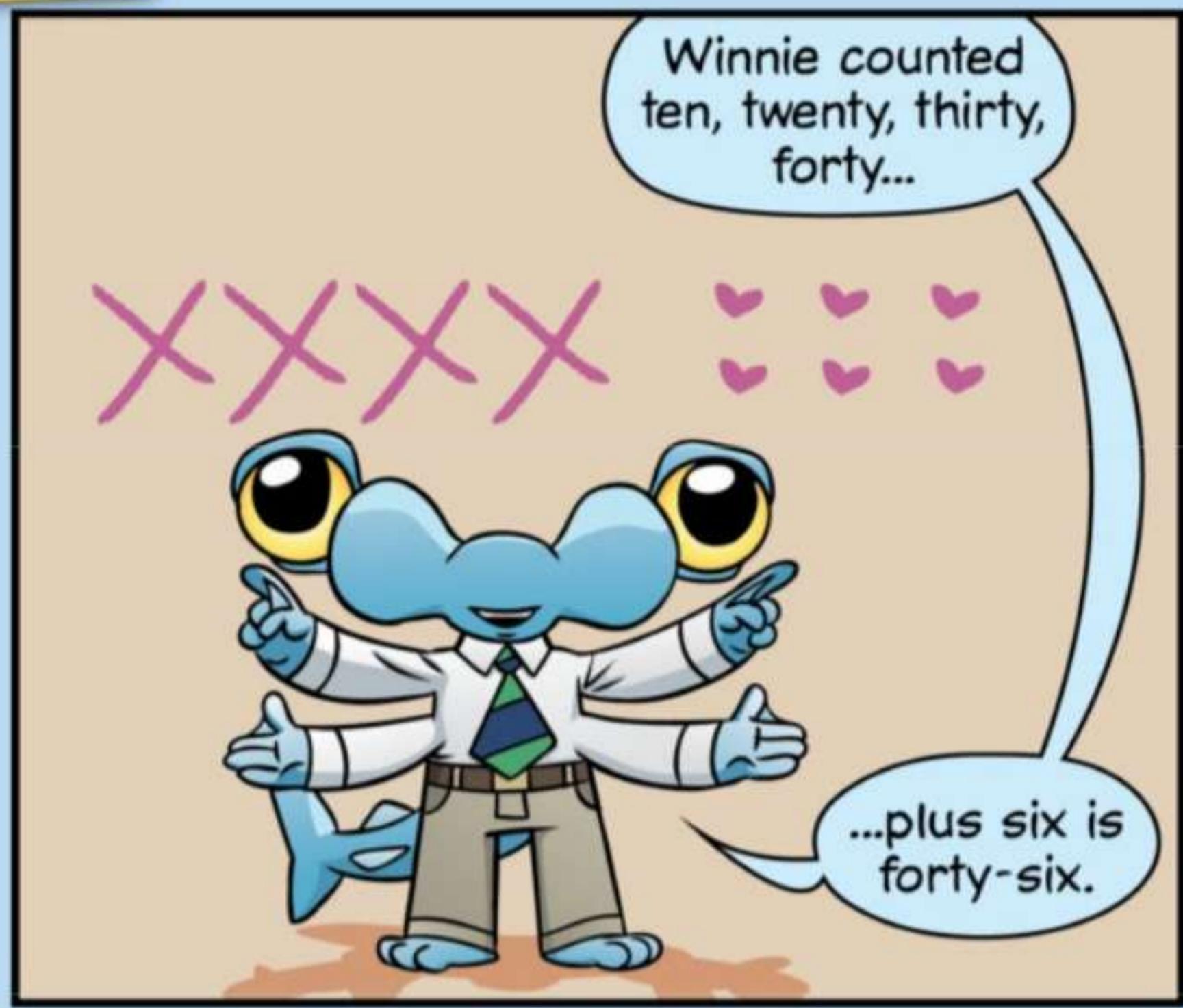
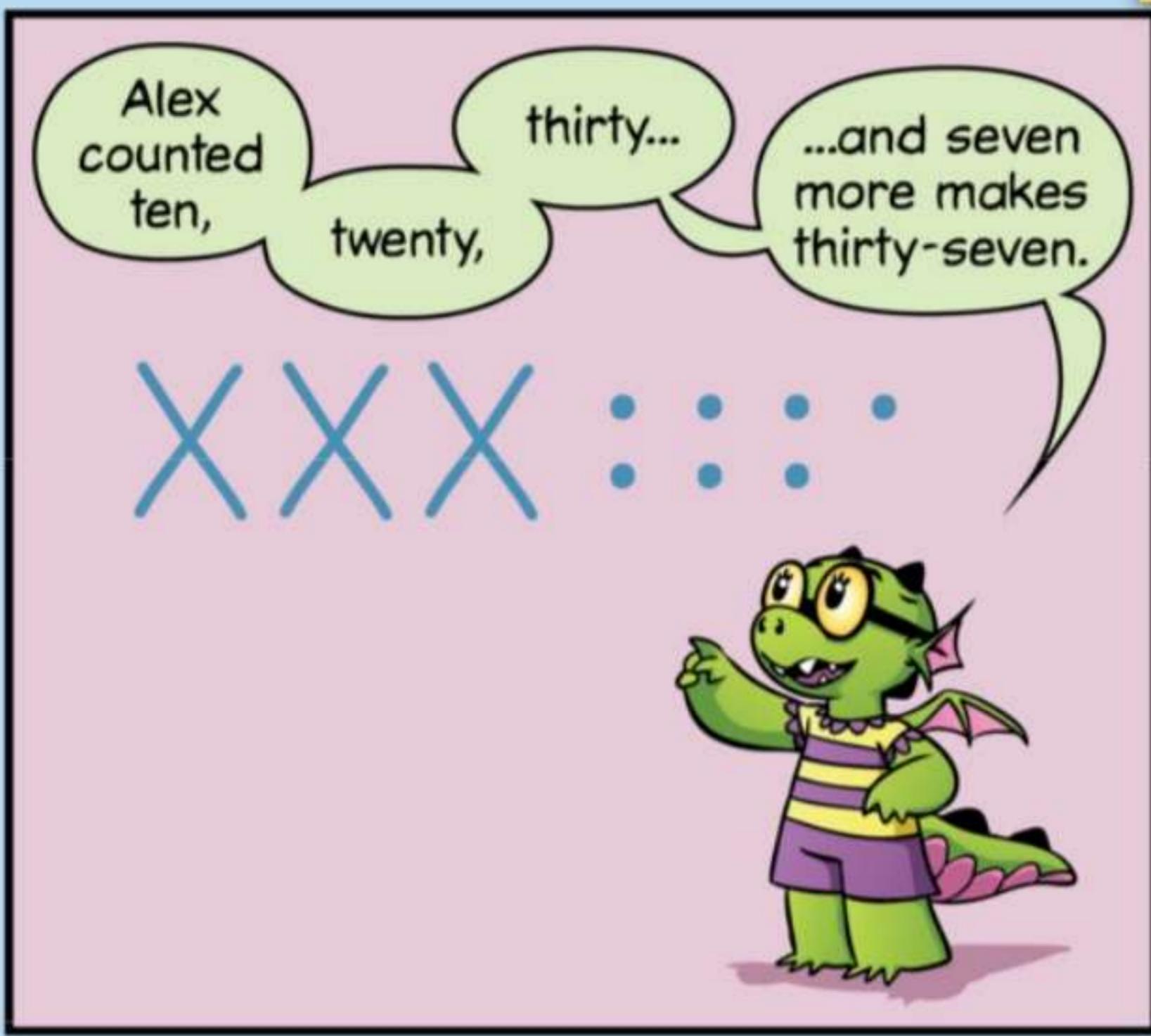




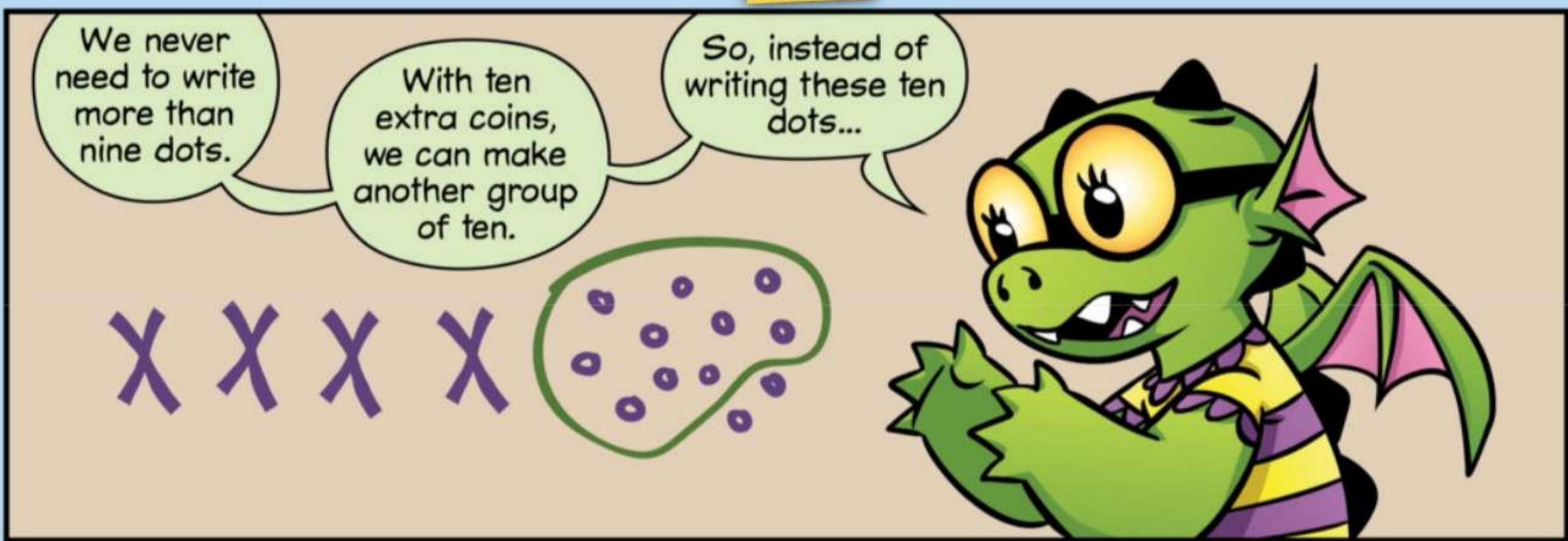




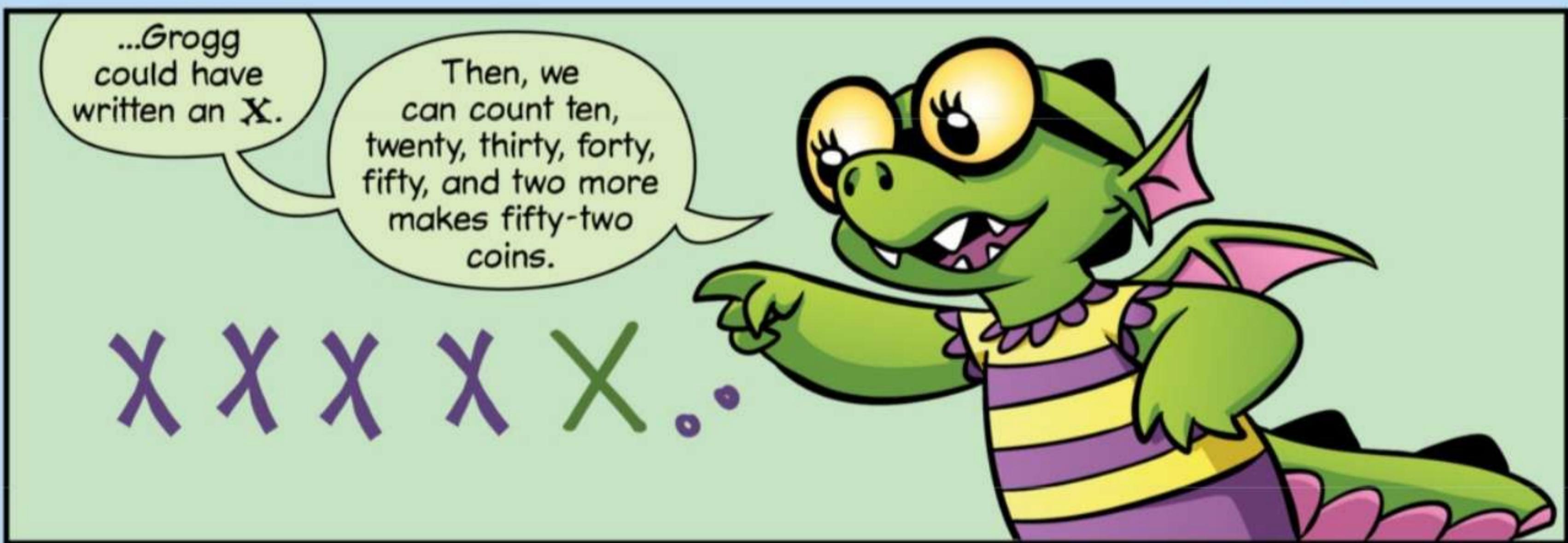
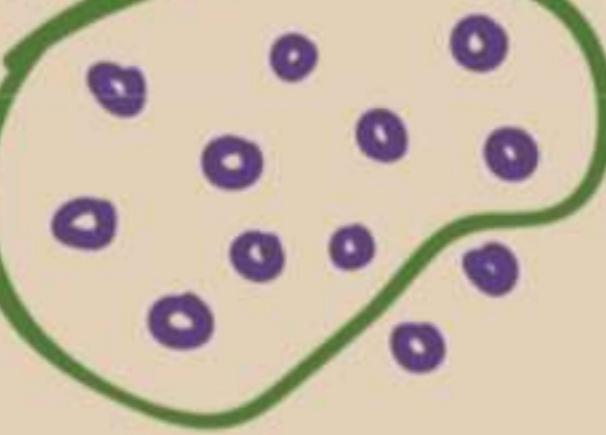
XX•



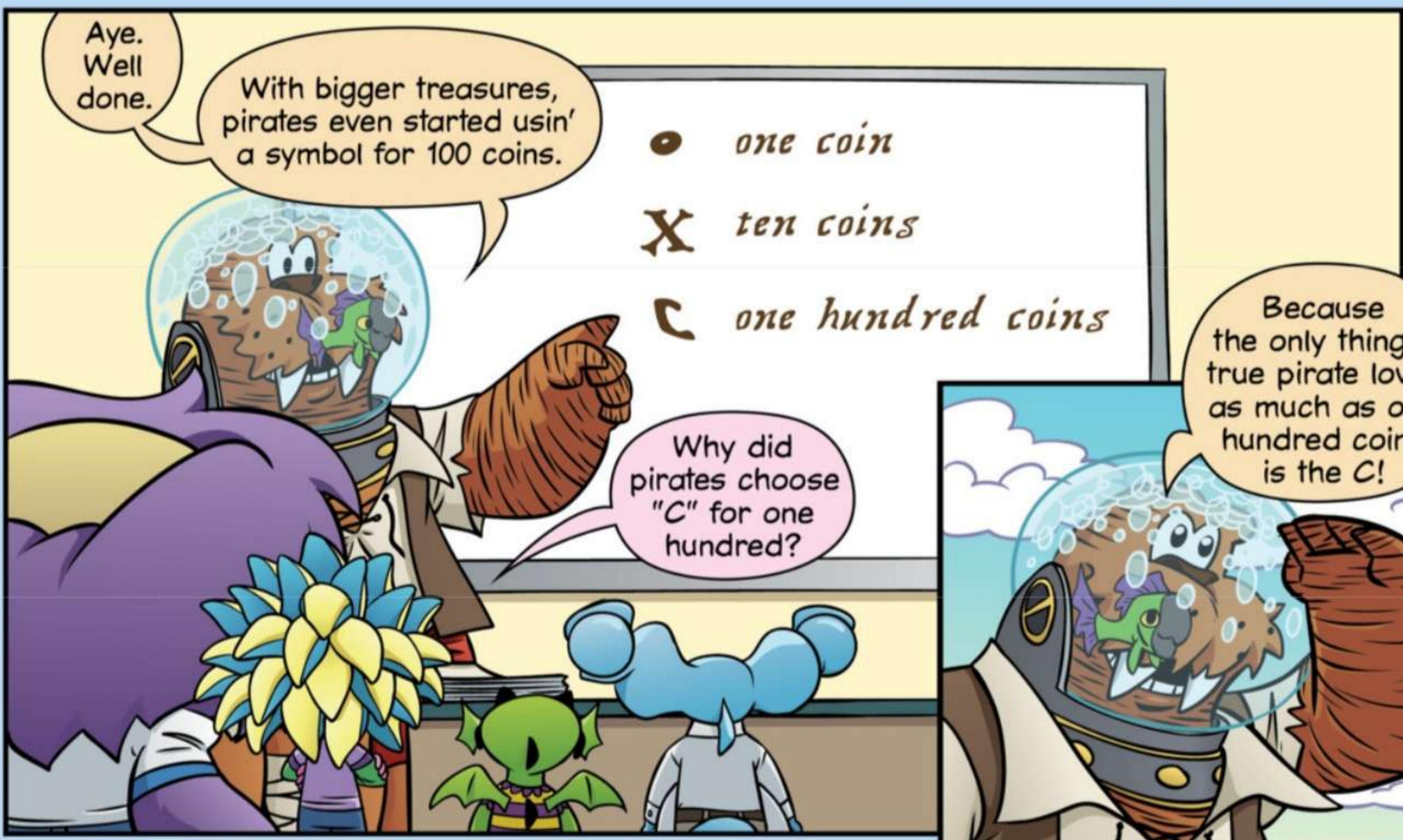
How
else could
you write
Grogg's
count?



XXXXX



XXXXXX..



MATH TEAM

Ones, Tens, Hundreds

Welcome to Math Team practice.

My name is Fiona.

Not long ago, I was sitting right where you are, eager to join the Beast Academy Math Team.



This year, I was asked to be the coach.

I'm excited to get started!



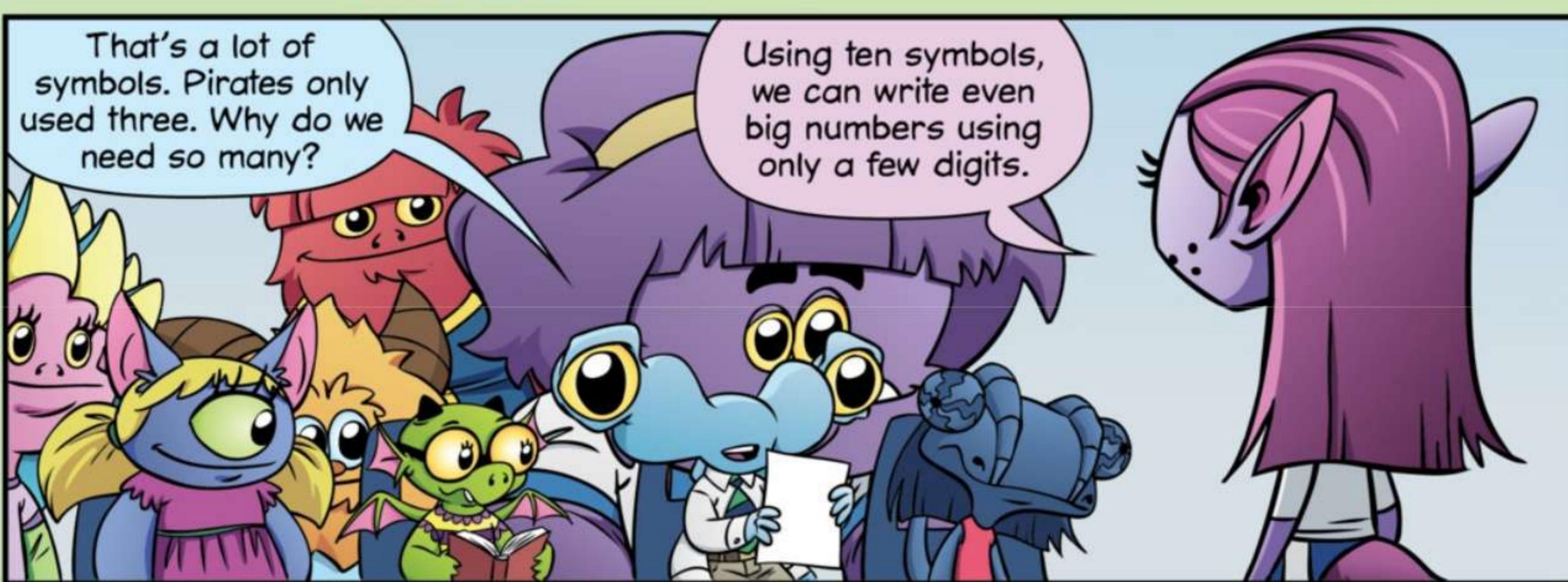
Today, we're going to talk about digits.

Digit is just a fancy word for number, right?

Not exactly.



A digit is a symbol we use to write numbers.





In pirate numbers, three X's stand for three groups of ten coins.

With digits, we just write a 3 for three tens.

In pirate numbers, seven dots stand for seven coins.

But with digits, we can just write a 7.

XXX : ...
37

So, 37 means 3 groups of ten, plus 7 more.

Excellent.

What two-digit number would you write for Winnie's coin count?

XXXX : ::



XXXX : ::
46

Winnie counted four groups of ten coins and six more coins.

So, we write a 4 and a 6 for forty-six.

Nice.

How would you write Lizzie's coin count using digits?

XXXX
4

Lizzie counted four groups of ten coins, so we write a 4 to stand for four tens.

Is that all?



Why can't a 4 by itself stand for four tens?

By itself, a 4 just stands for four, not four tens.

We need another digit!

In a two-digit number, the digit on the left tells you how many tens there are.

And the digit on the right tells you how many ones there are.



tens	ones
XXXX	
4	0

That's right. Two-digit numbers have a **tens digit** and a **ones digit**.

Lizzie's coin count has 4 tens and 0 ones.

So, we write Lizzie's coin count with a 4 and a 0.

To write my coin count as a two-digit number, I write a 5 for five tens...

...and a 2 for two ones.

tens	Ones
XXXXXX	..
5	2



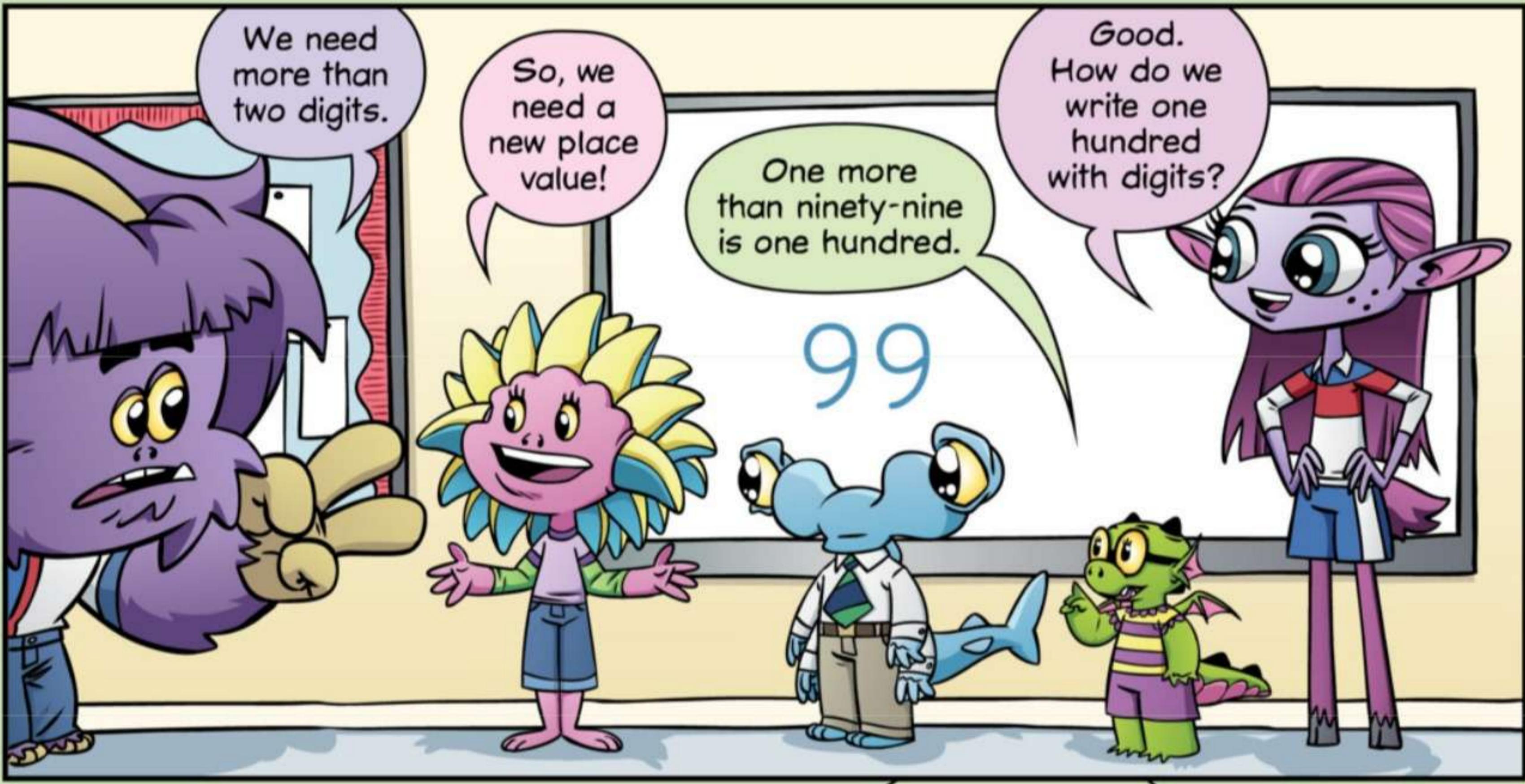
Great. In our number system, each digit has a **place value**.

In 52, the 5 is in the tens place and the 2 is in the ones place.

What is the largest two-digit number you can write?

What is it?







...the middle digit tells you how many tens there are...

...and the right digit tells you how many ones there are.

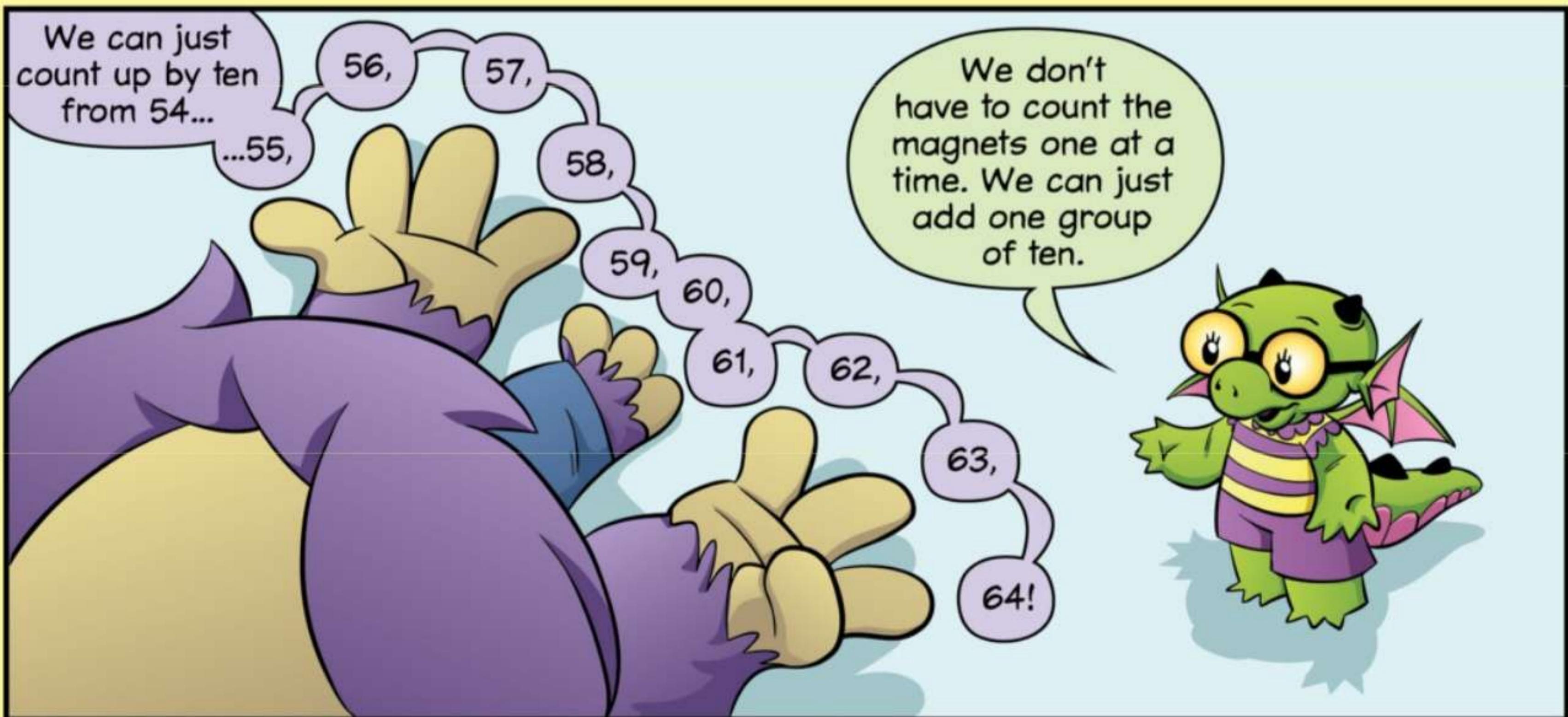
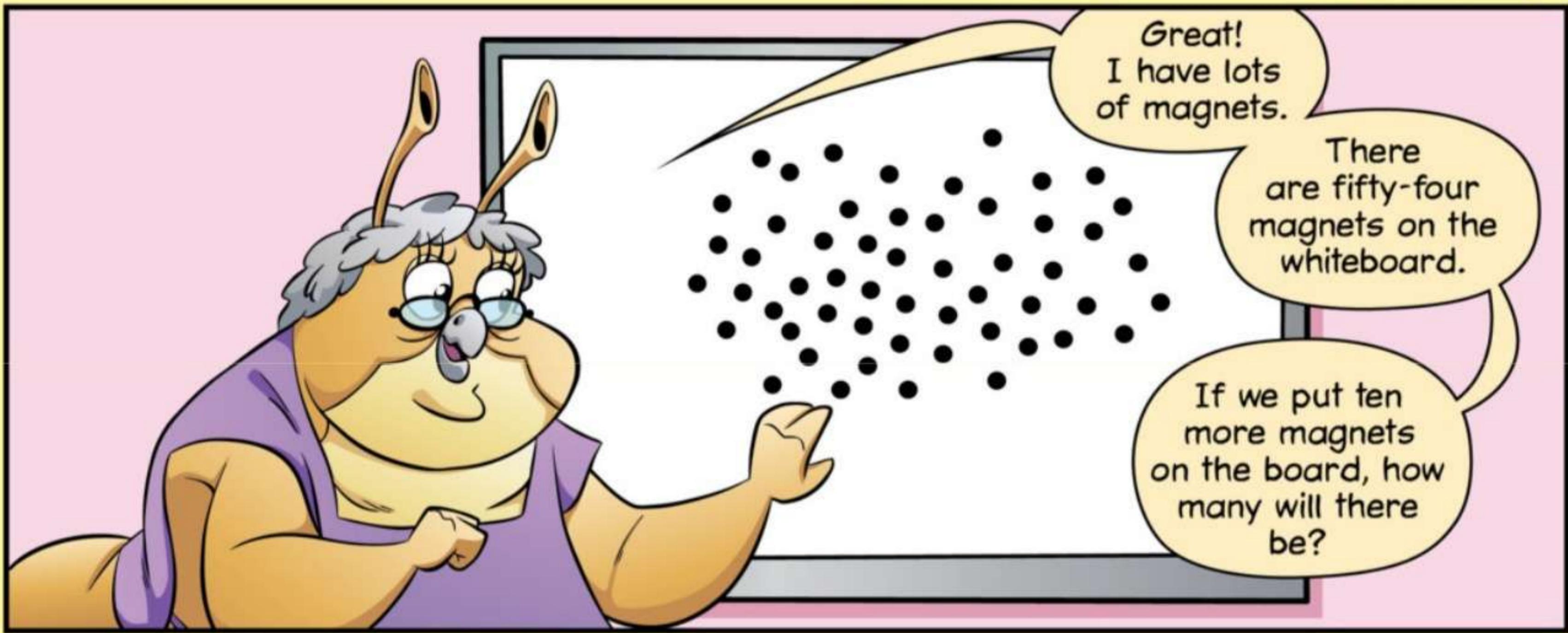
100 is the smallest three-digit number.

hundreds → tens → ones
100



Ms. Q.

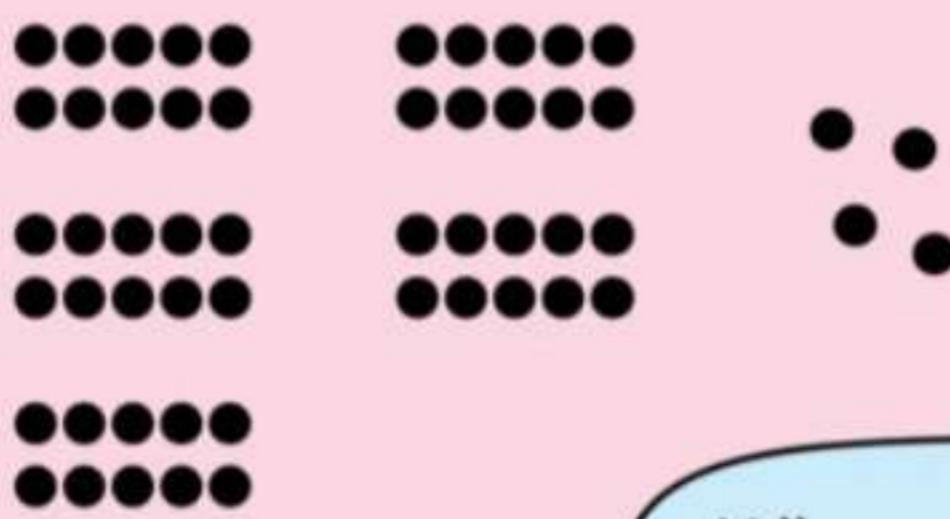
Regrouping & Breaking



The number 54 means 5 tens and 4 ones.



54 magnets



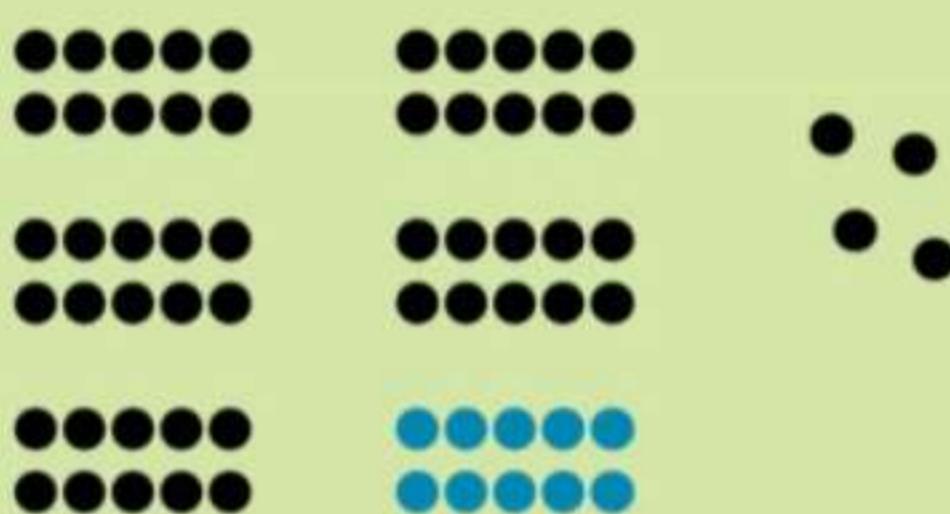
When we add 1 group of ten...



...that makes 6 groups of ten, and 4 extra magnets. That's 64 magnets.



64 magnets



Good. What if we add ten **more** magnets to the board?

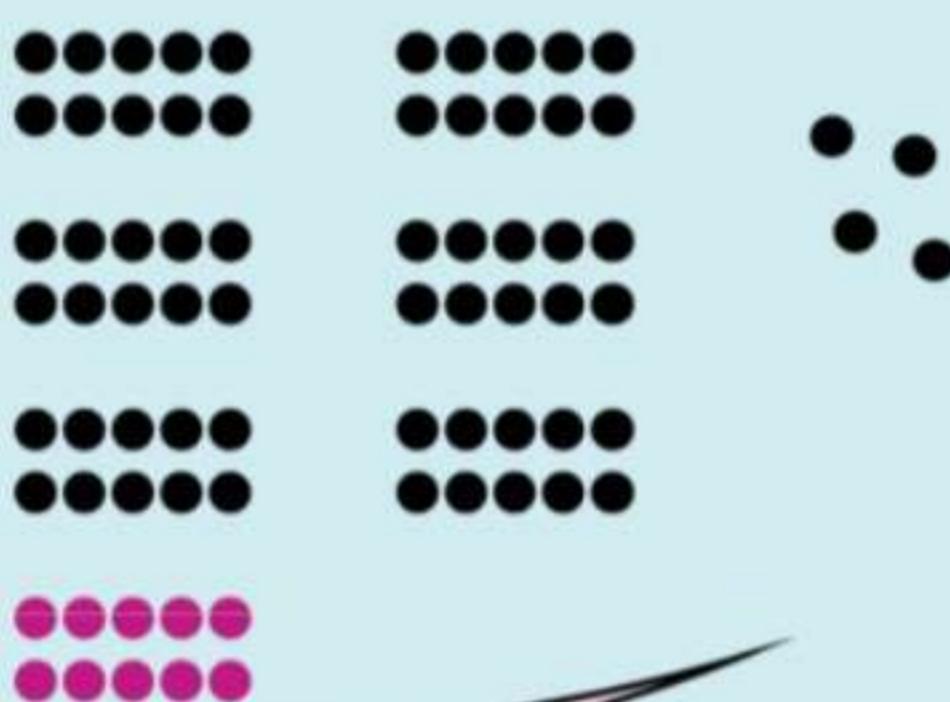


Adding another group of ten gives us 7 groups of ten and 4 extras.

That's 74 magnets.

When we add ten to a number, the tens digit goes up by 1.

74 magnets



Very good. The symbol for addition is called a **plus sign**. 64 plus 10 looks like this.

When we add ten to sixty-four, the tens digit increases by one and we get seventy-four.

$$64 + 10 = 74$$

Will adding ten to a number **always** increase its tens digit by one?

Will it?

What if the tens digit is a 9, like in 94?

Since there isn't a digit bigger than 9, we can't increase the tens digit in 94.

How do we add ten to 94, then?

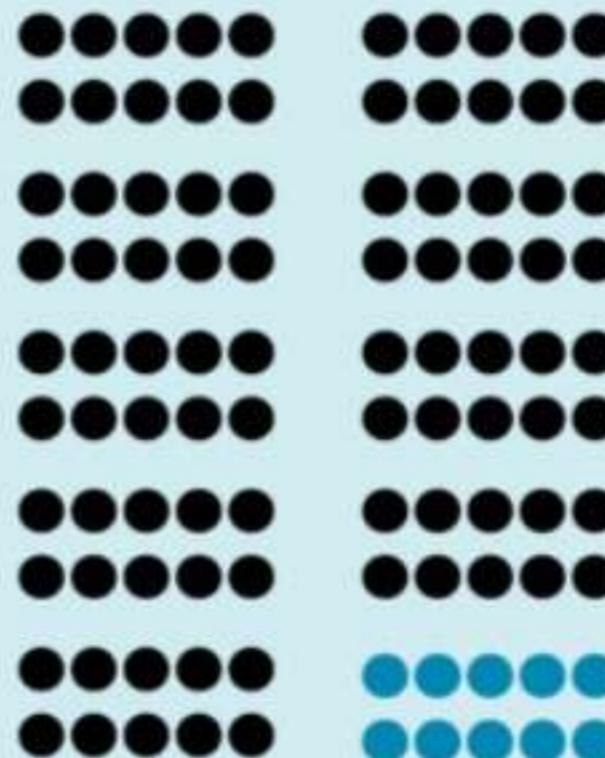
$$94 + 10 =$$



Adding ten to 94 gives us a total of 10 tens.



$$94 + 10 =$$



10 tens is 1 hundred.



Since we can group 10 tens to make 1 hundred...

...adding ten to 94 gives us 1 hundred, 0 tens, and 4 ones.

That's 104!

$$94 + 10 = 104$$



That's right. We can combine 10 tens to make 1 hundred.

This is called **regrouping**.

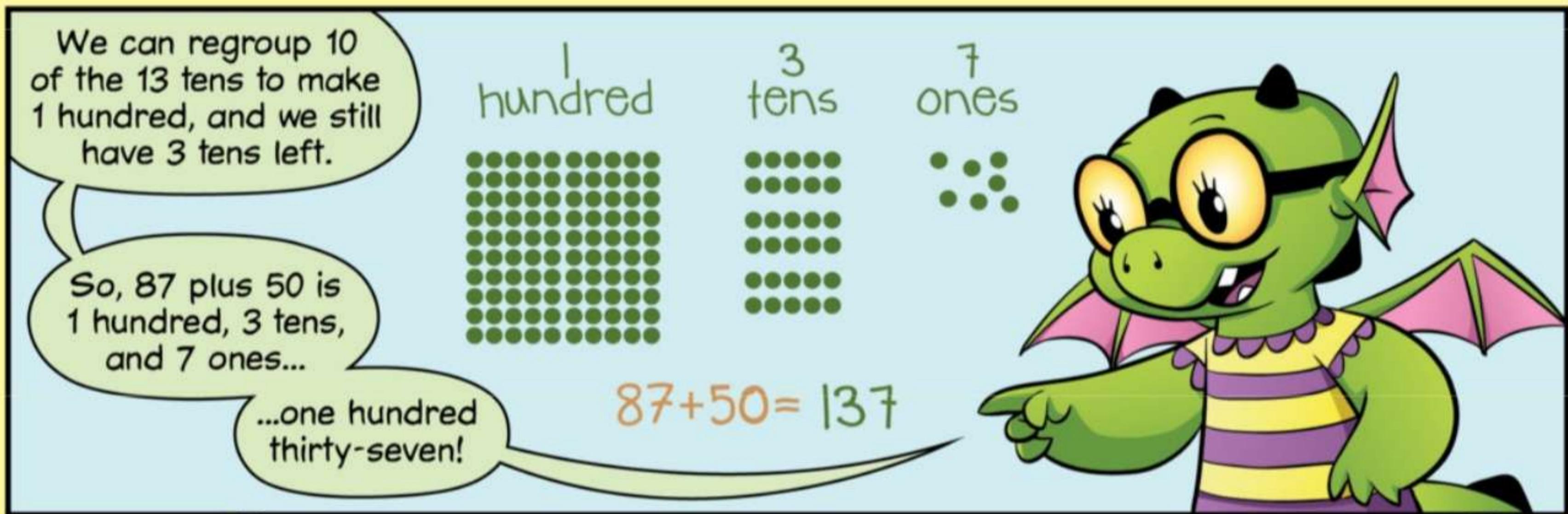
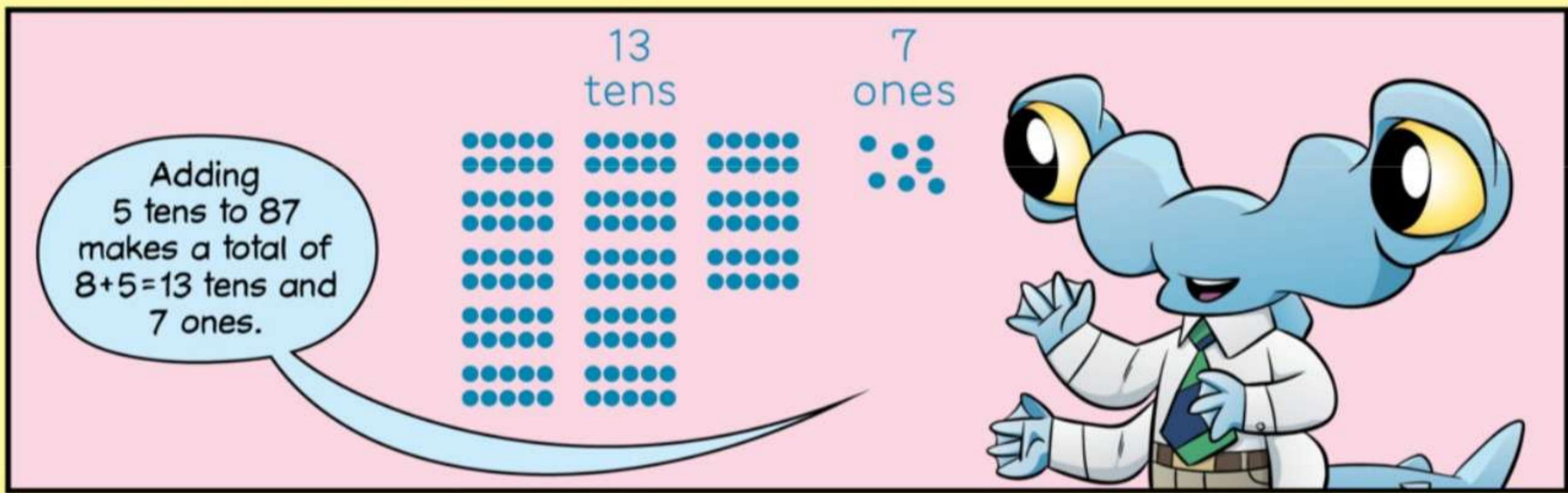
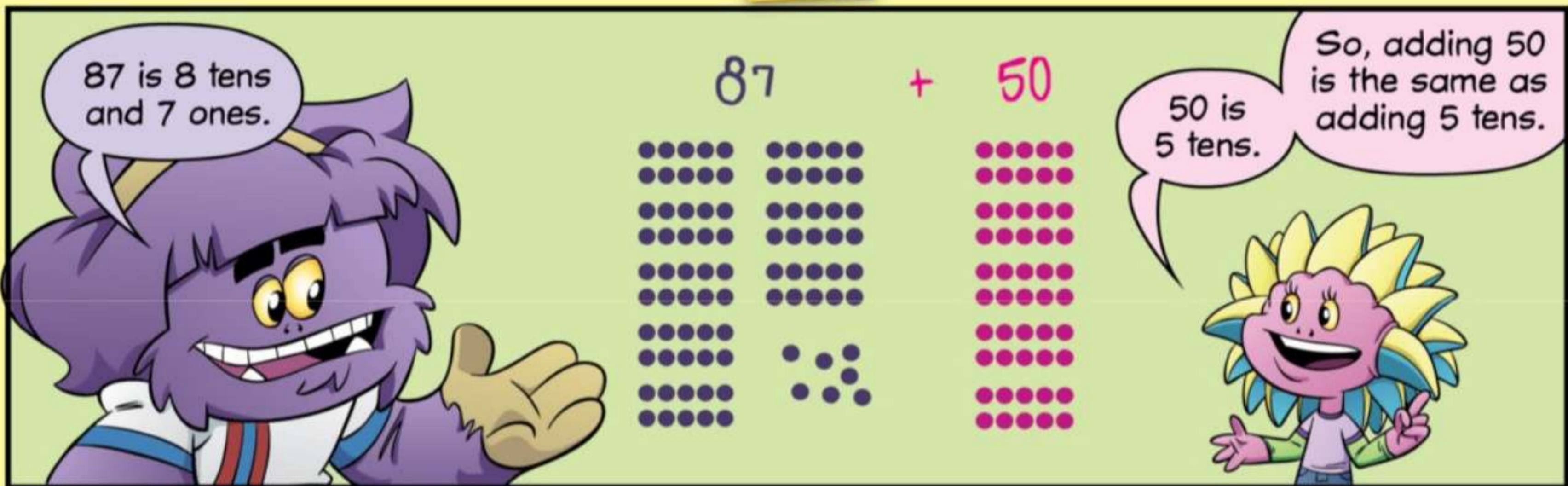
$$87 + 50 =$$

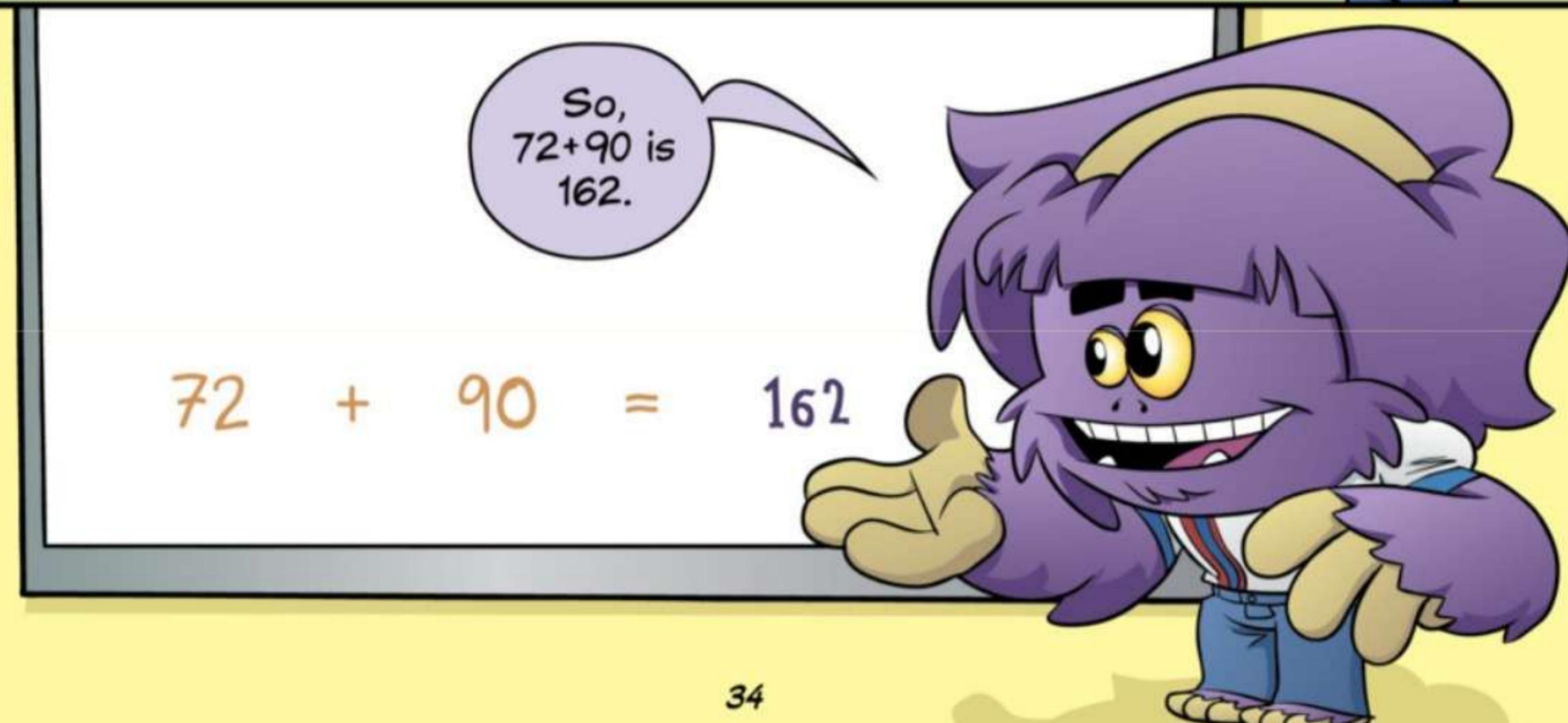
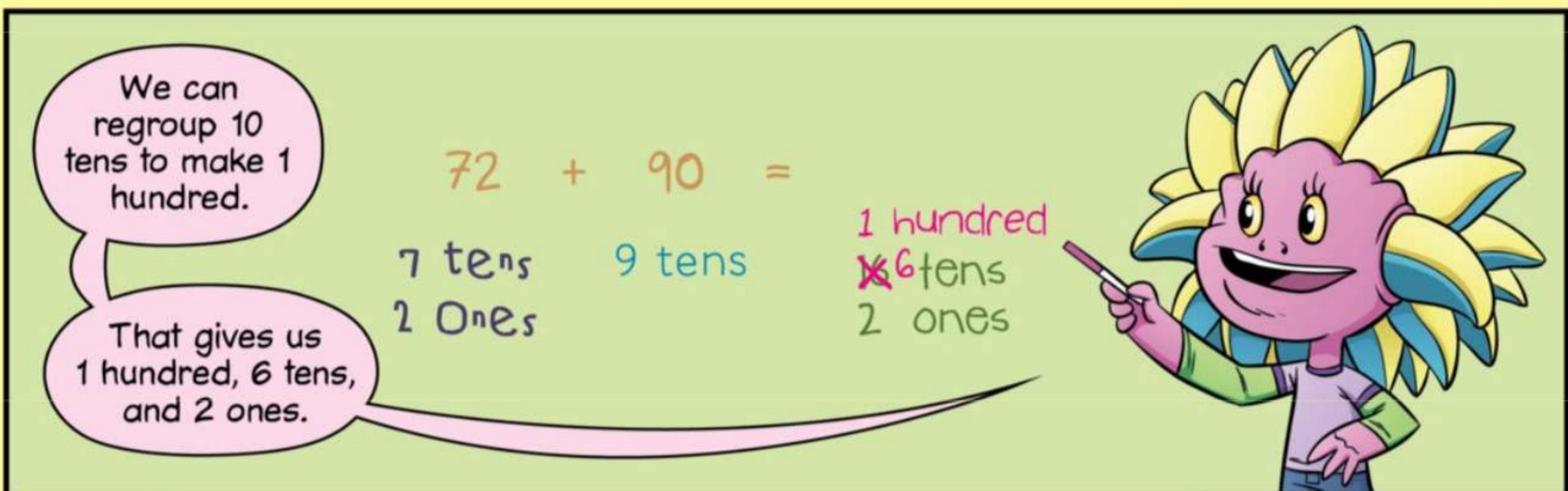
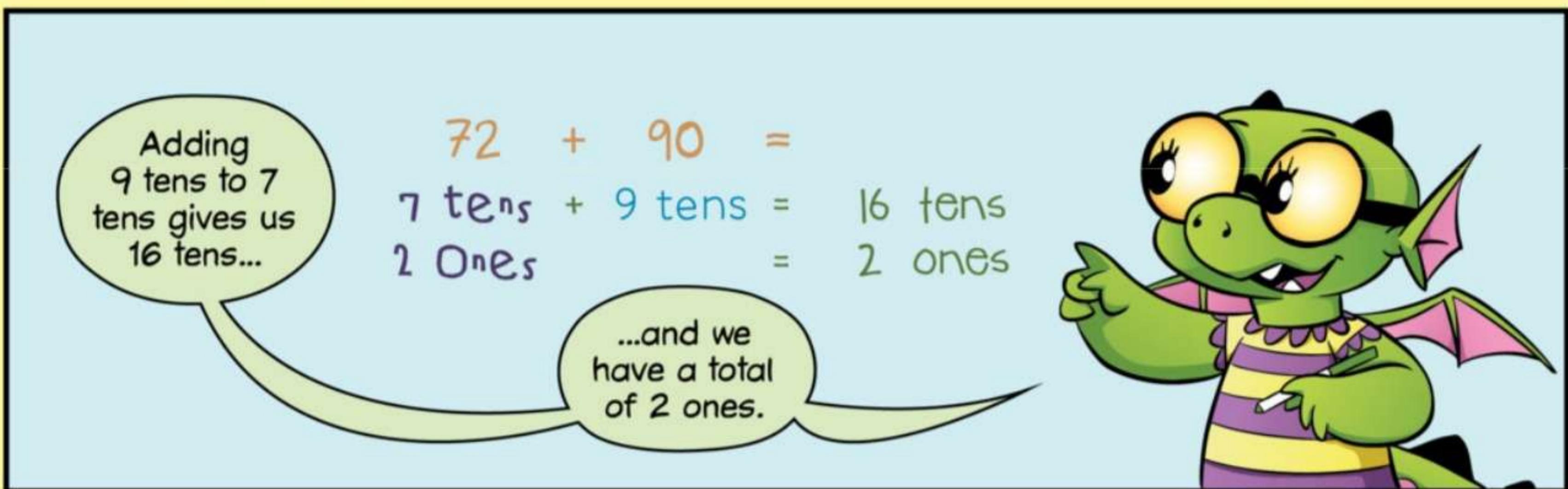
Let's try adding more than 1 ten to a number.

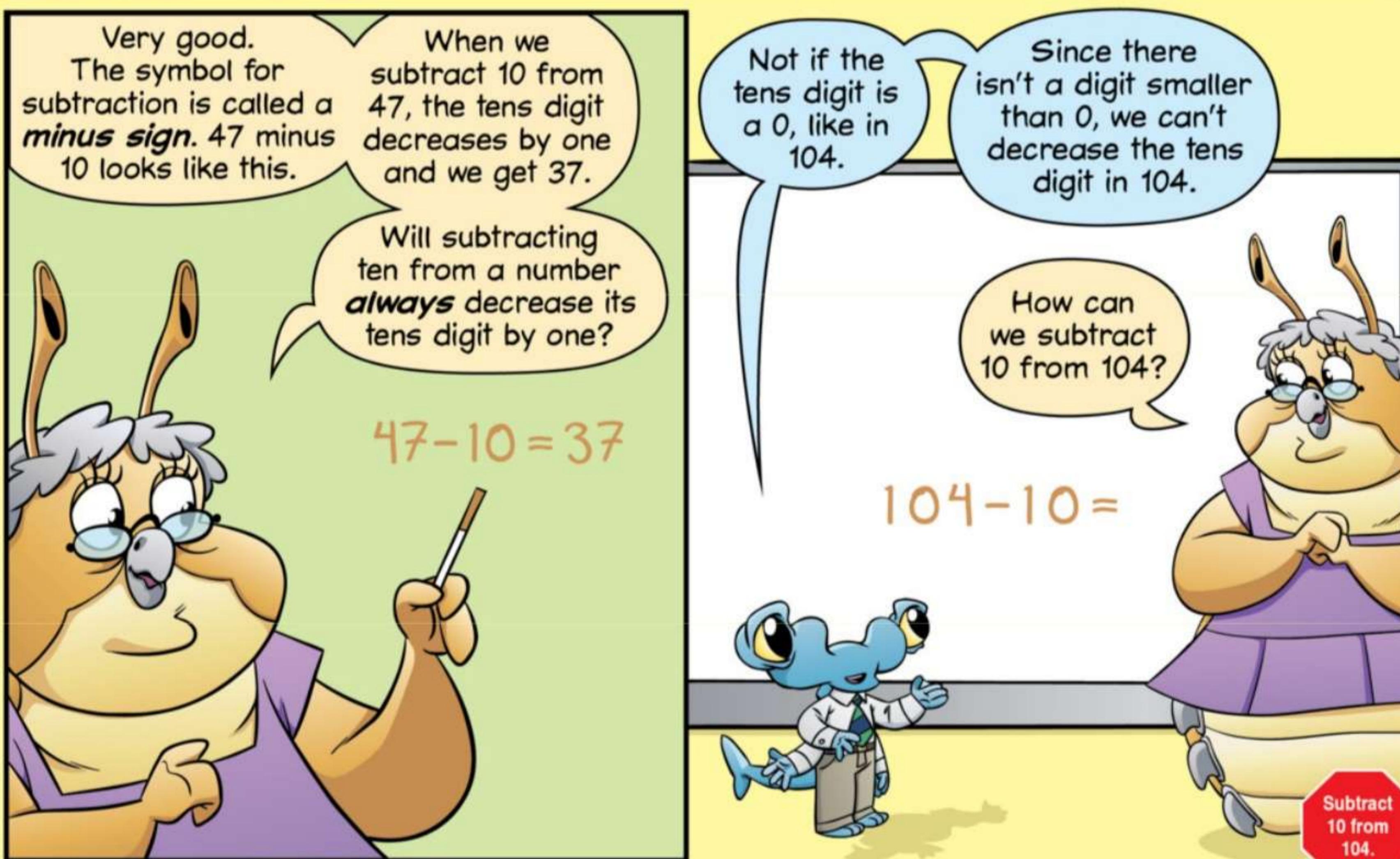
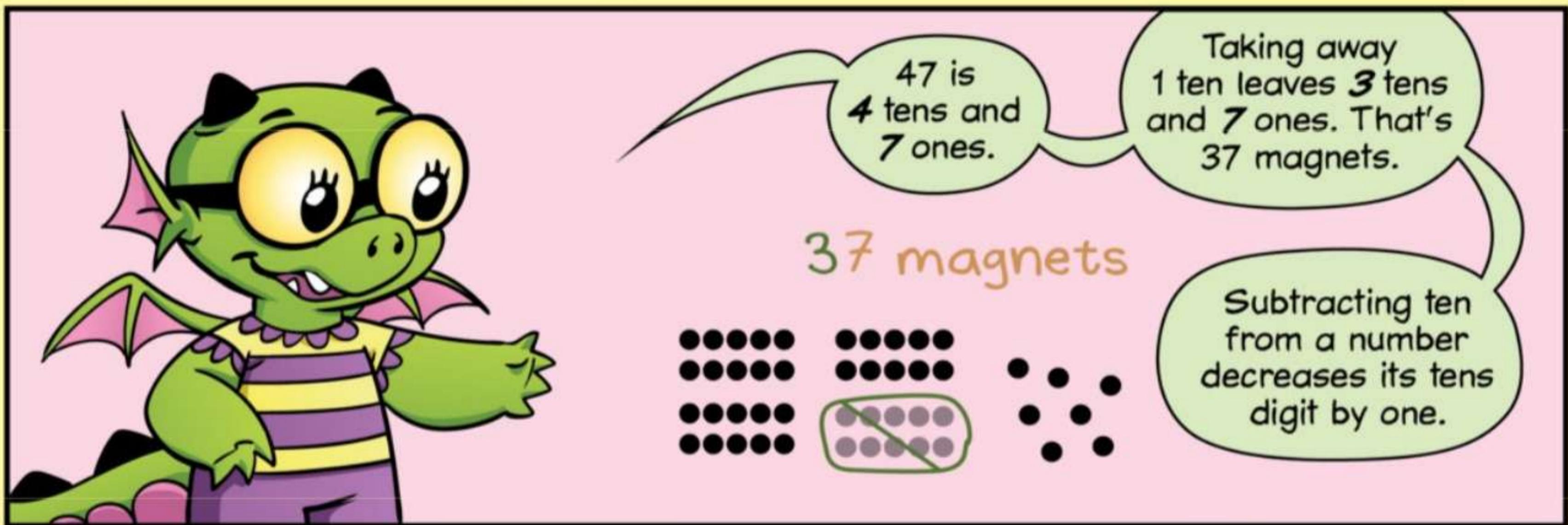
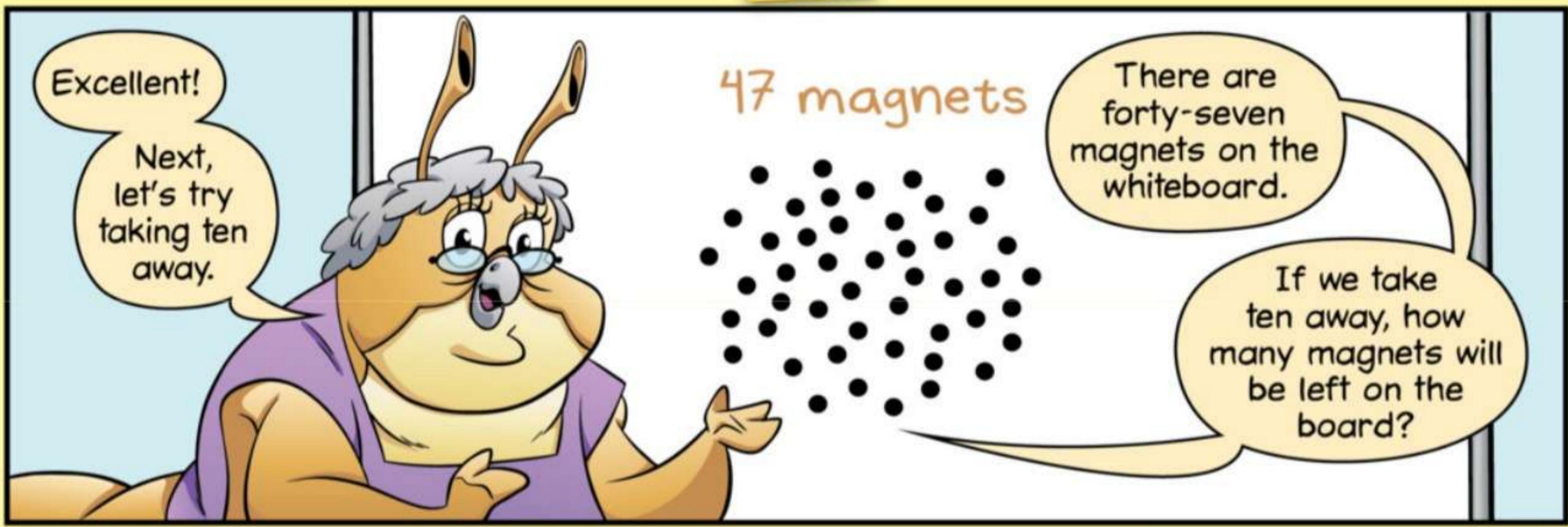
What do I get if I add 50 to 87?

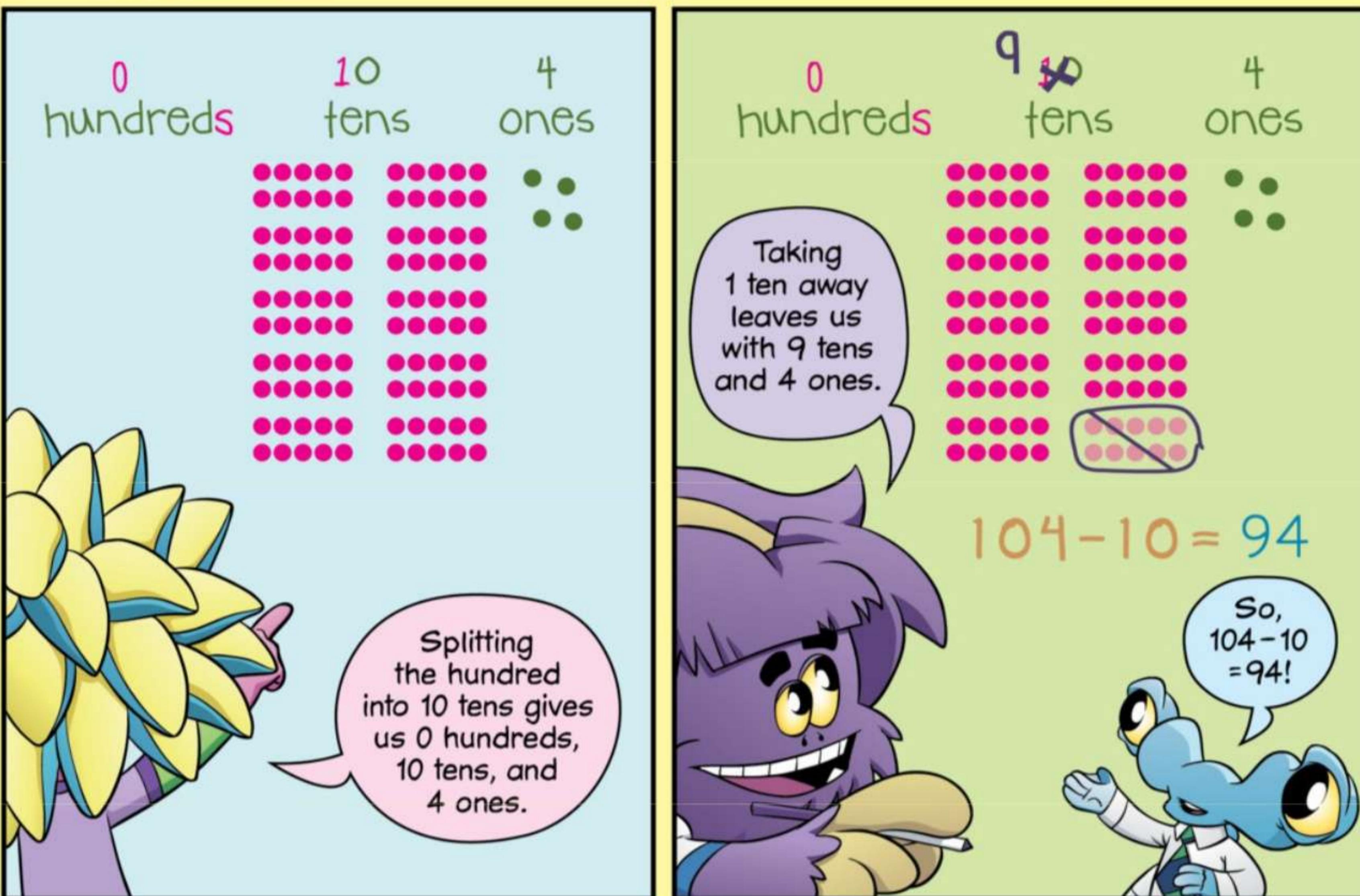
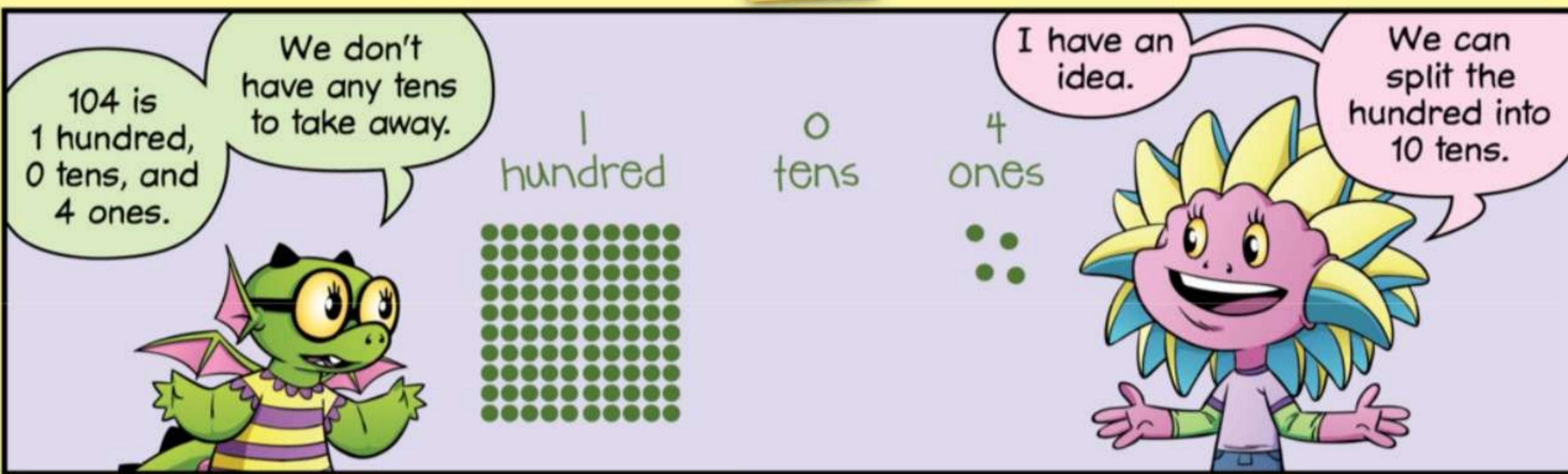


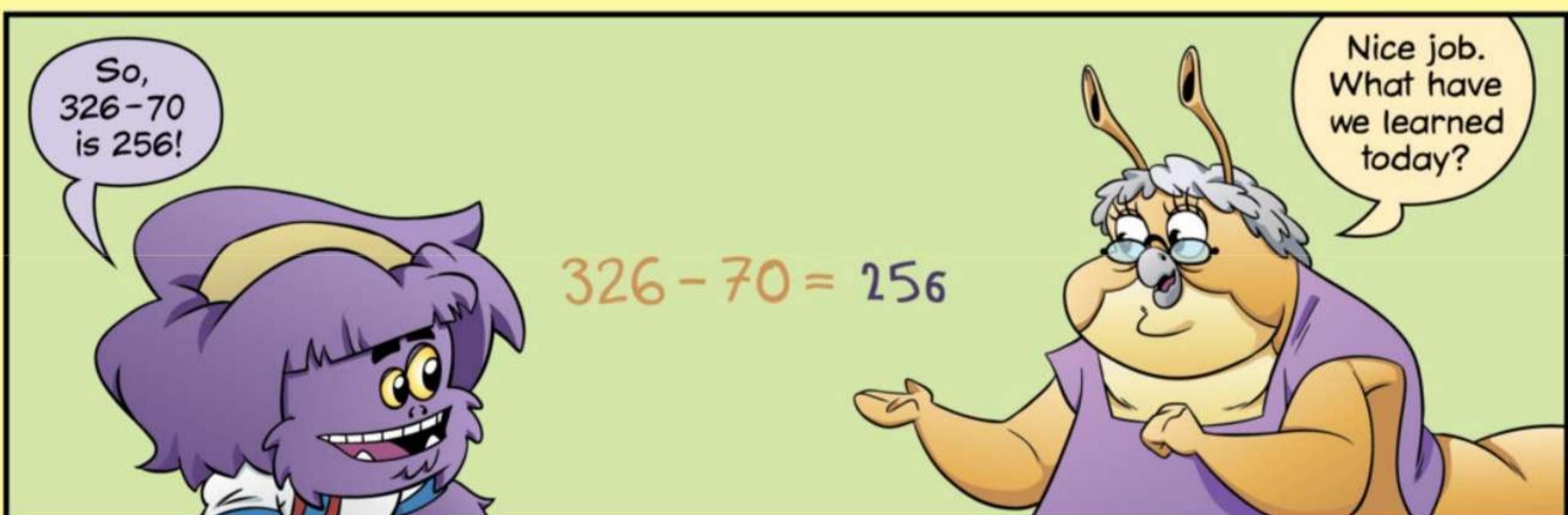
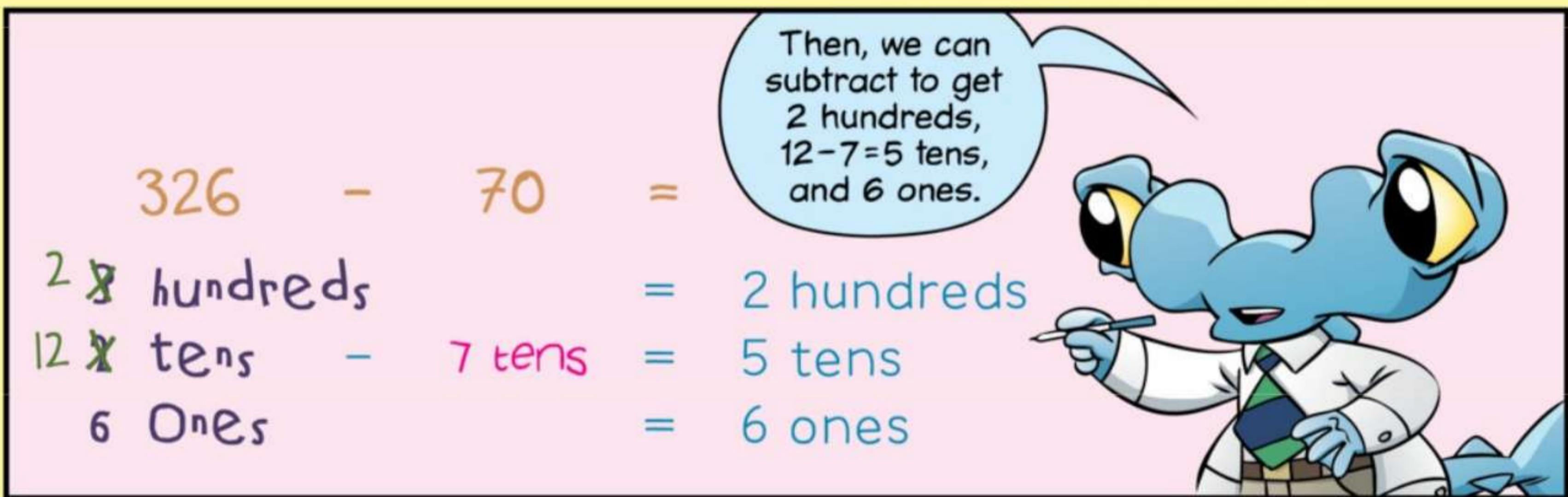
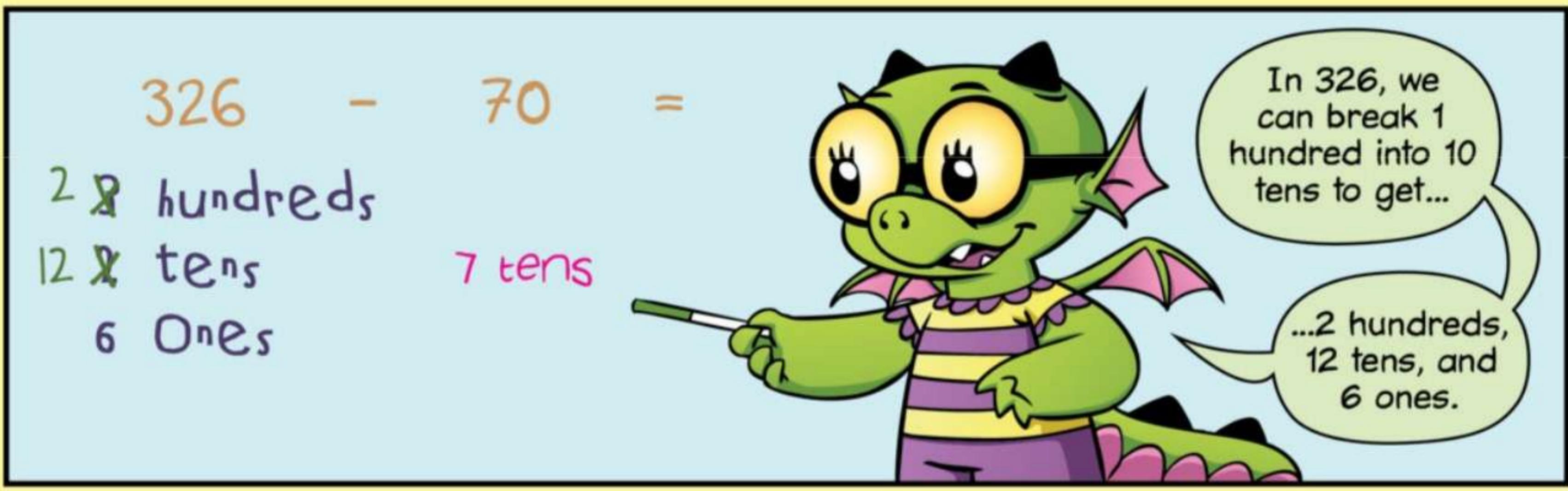
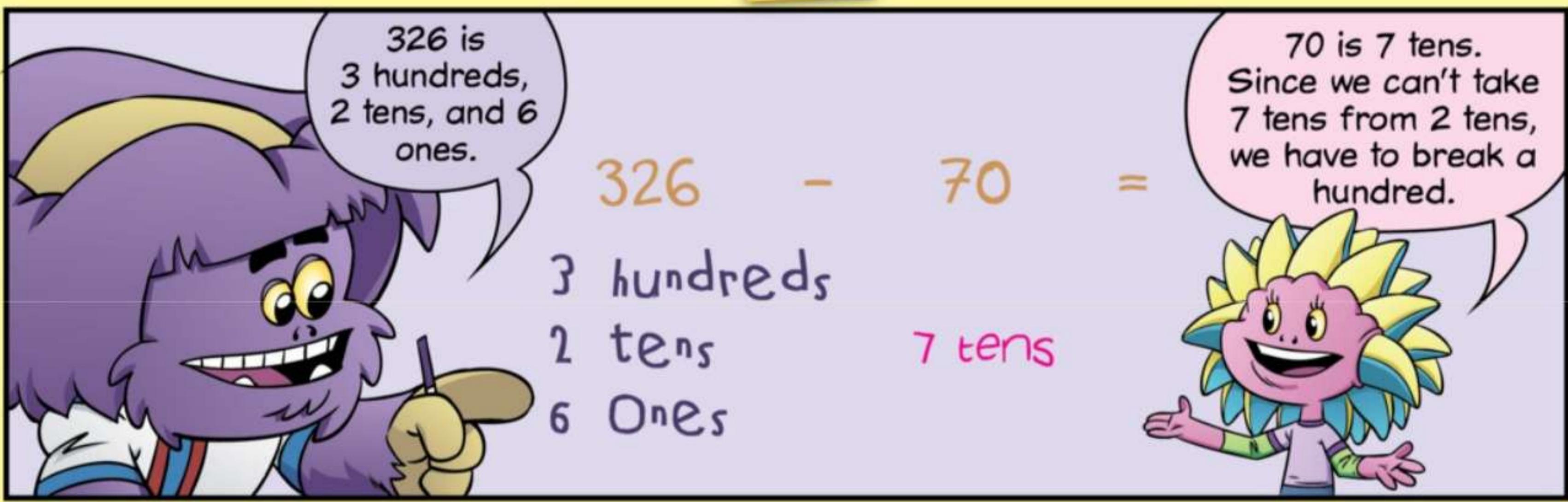
Try it.













When we add numbers, sometimes we need to regroup 10 ones to make 1 ten...

$$\begin{array}{r} 58 \\ + 7 \\ \hline 65 \end{array}$$

5 tens
8 ones

7 ones

6 tens
5 ones

$$\begin{array}{r} 62 \\ + 70 \\ \hline 132 \end{array}$$

6 tens
2 ones

7 tens

1 hundred
3 tens
2 ones

...or 10 tens to make 1 hundred.



And when we subtract numbers, sometimes we need to break 1 ten to make 10 ones...

$$\begin{array}{r} 64 \\ - 7 \\ \hline 57 \end{array}$$

5 tens
14 ones

7 ones

5 tens
7 ones

$$\begin{array}{r} 136 \\ - 50 \\ \hline 86 \end{array}$$

0 hundreds
13 tens
6 ones

5 tens

8 tens
6 ones

...or 1 hundred to make 10 tens.





So, Grogg,
what else is
on your list of
magical items?

TOP 10

1. bicycles why don't they tip over?
2. candles where does all the wax go?
3. soap bubbles you even make them with a wand!
4. magnets how do they work?
5. marshmallows magically delicious!
6. thermoses keep hot stuff hot and cold stuff cold!
7. uncle herman took my nose!
8. electricity why doesn't it come out of the holes?
9. magicians self-explanatory.
10. eyebrows how do they know when to stop growing?

Loads of
stuff, Ms. Q.
Here's my
top ten!

