# Helping Struggling Students Make Sense of Math

## (and come to understand that matters and is super helpful!)

Annie Fetter
Twitter: @MFAnnie

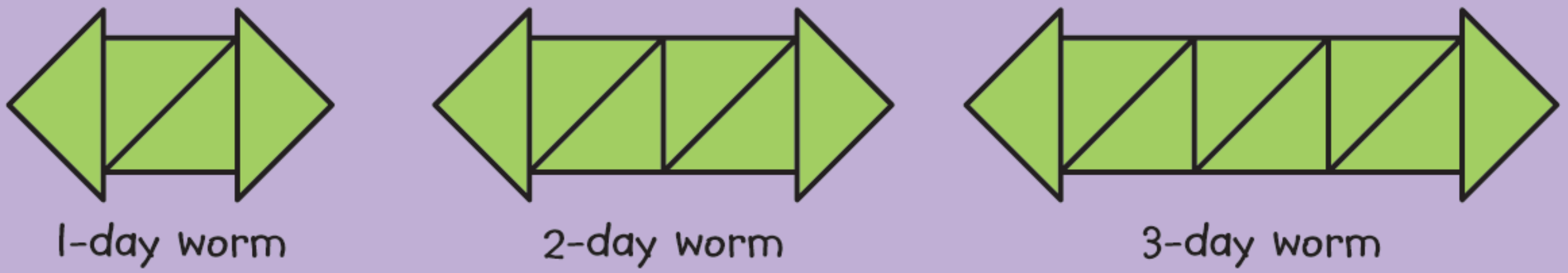
Tutors for Kids, The Villages, April 2023

# Reminder: Your tutee has math ideas.

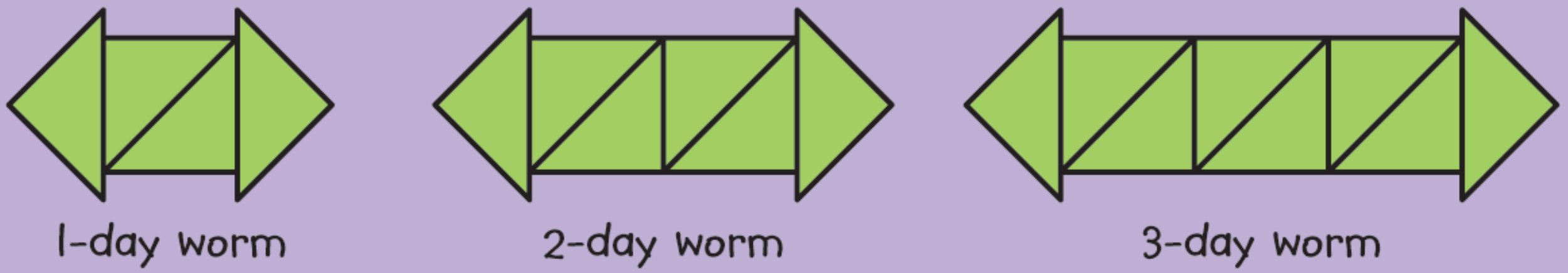
# Your job is to make them believe that someone (you) wants to listen to those ideas.

# Partner Talk

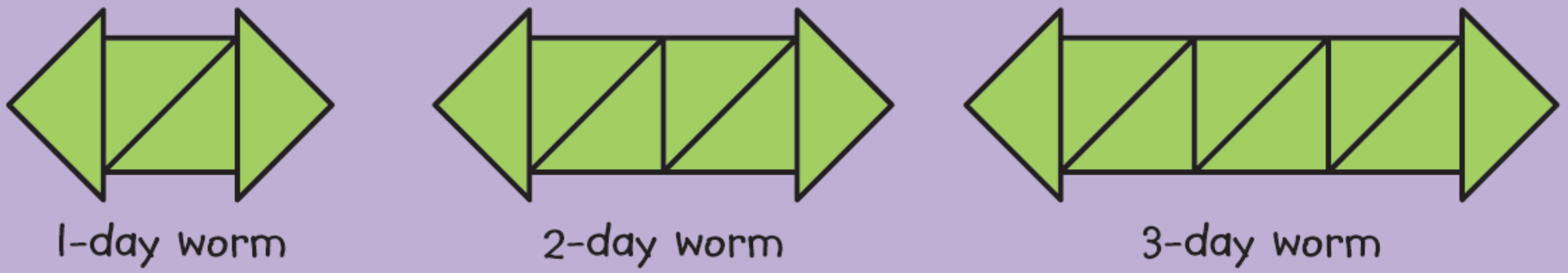
# Growing Worms Scenario



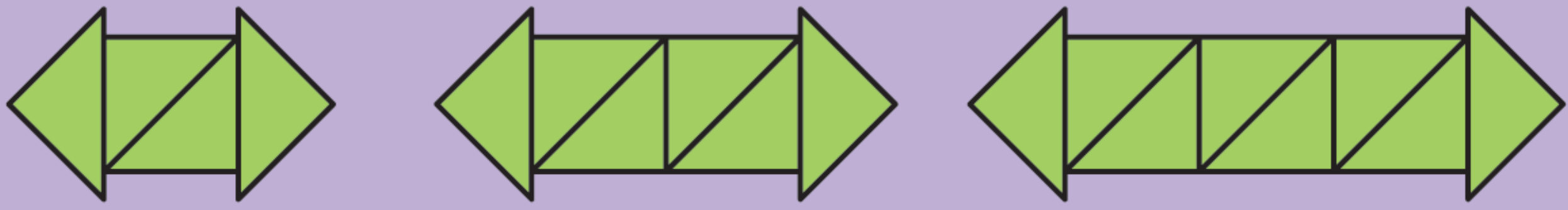
# Growing Worms Scenario



# Growing Worms Scenario



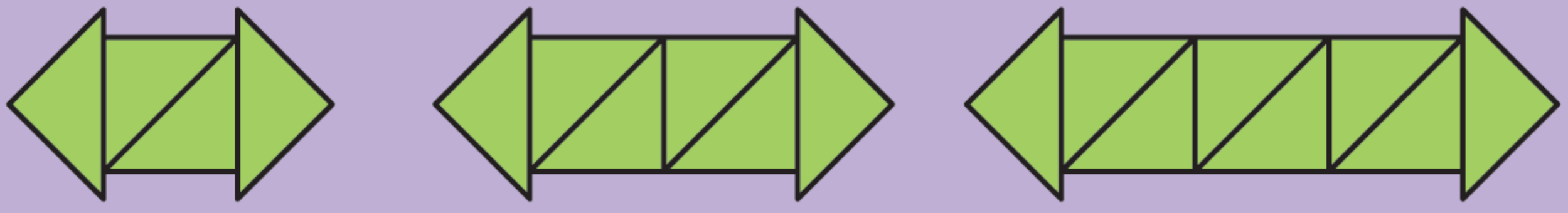
# Growing Worms Scenario




What do you notice?

What do you wonder?

# Growing Worms Task



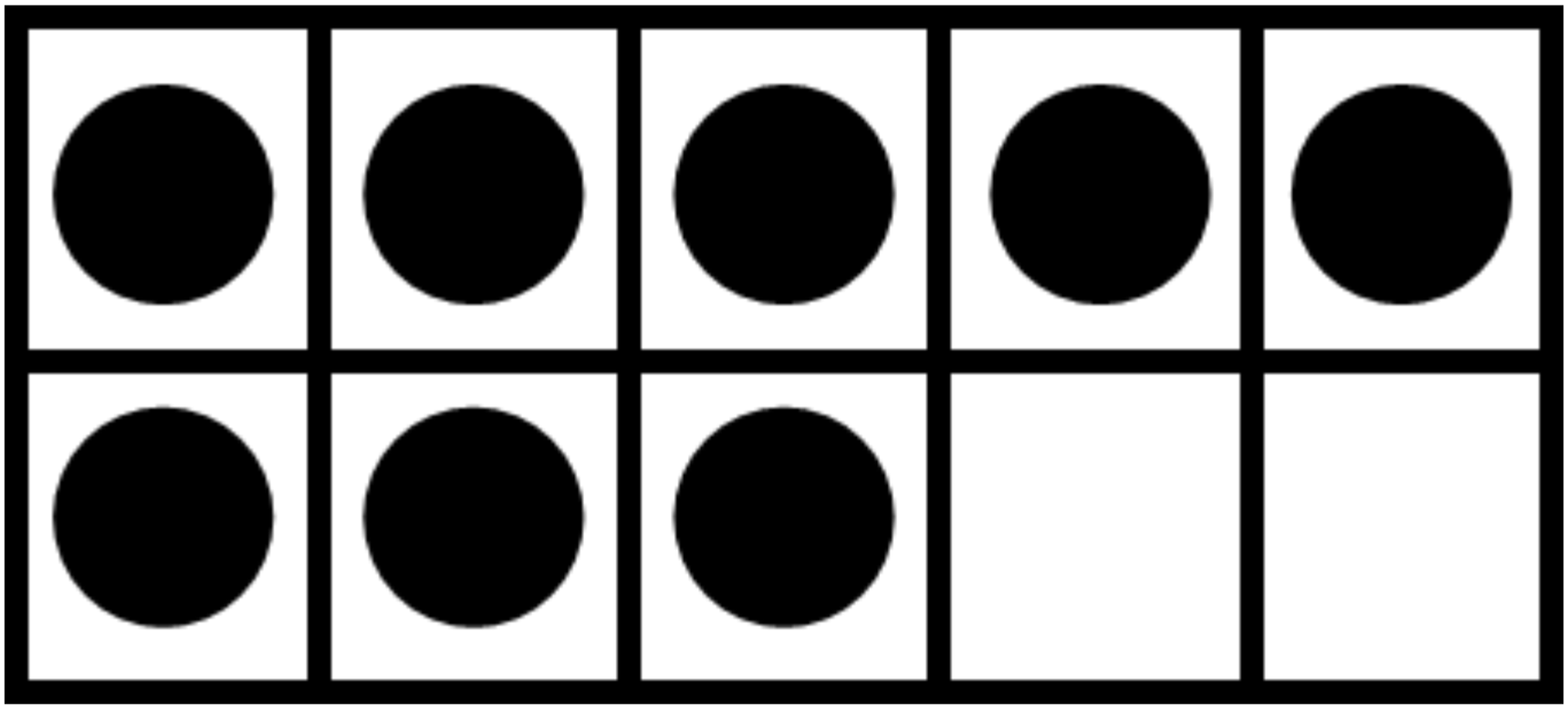

How many triangles are in a 10-day worm?

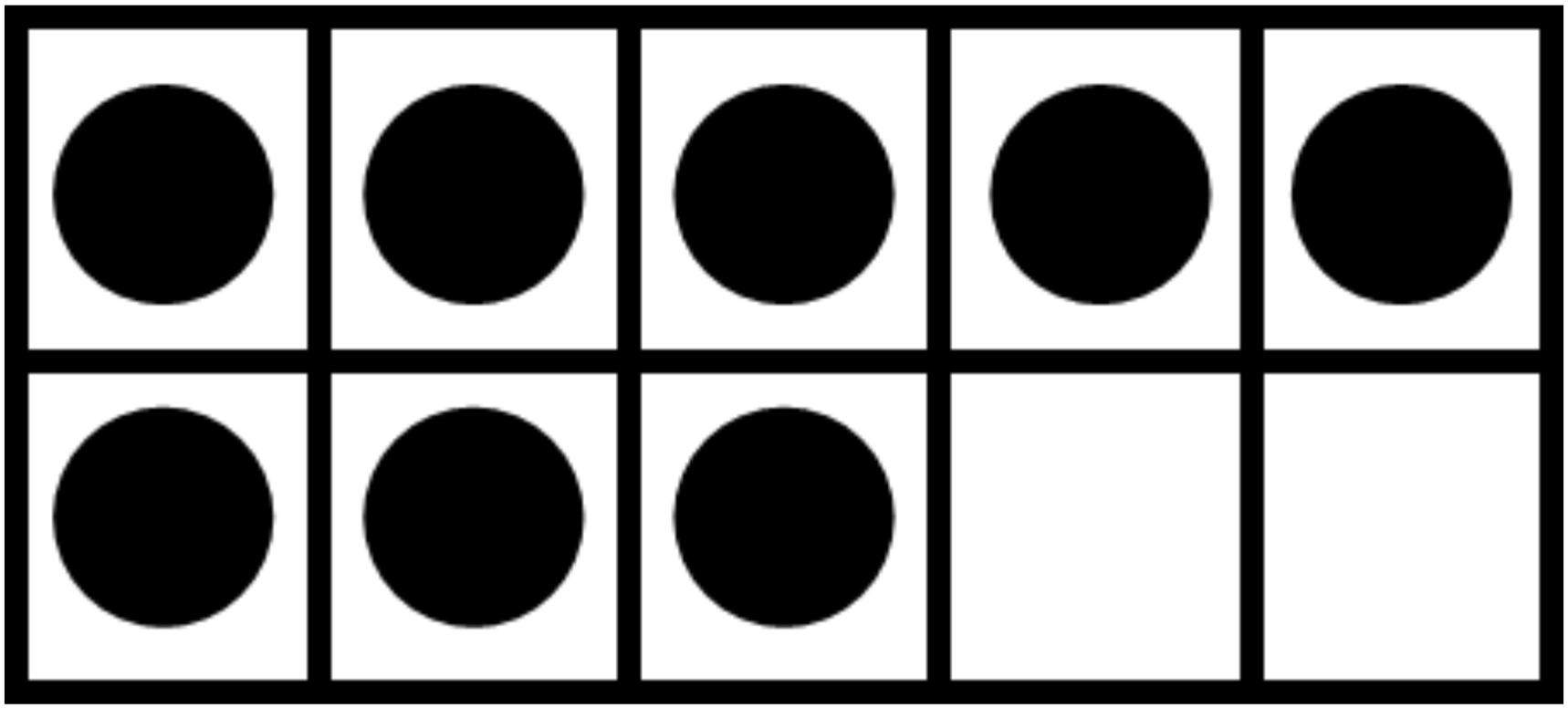
What day worm has 102 triangles?

# How Many?

# How Did You Count?

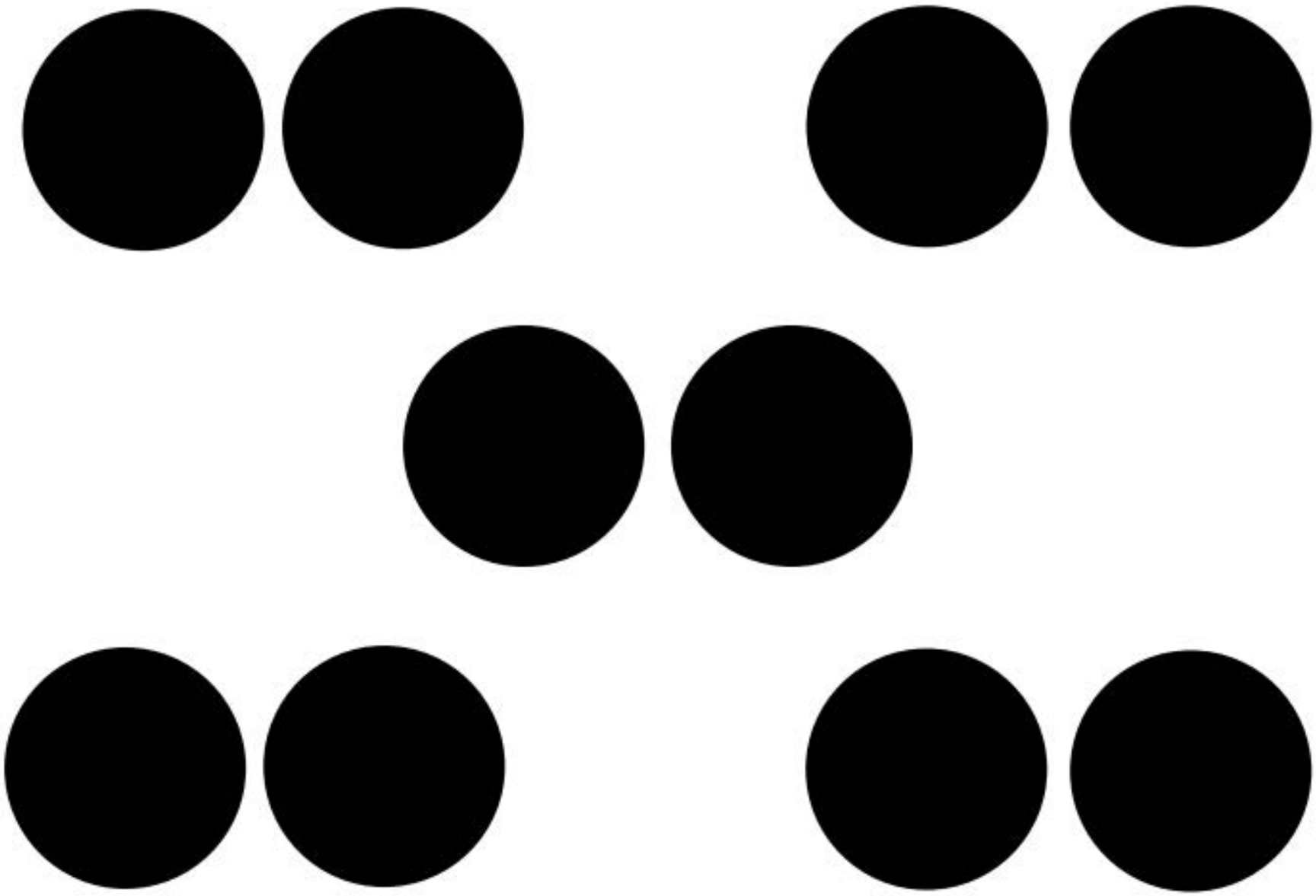
# Show Me When You're Ready





# New Guidelines

- Put your thumb up when you have an answer and are ready to describe how you figured it out.
- Add another finger for every other way you see that it could be figured out.



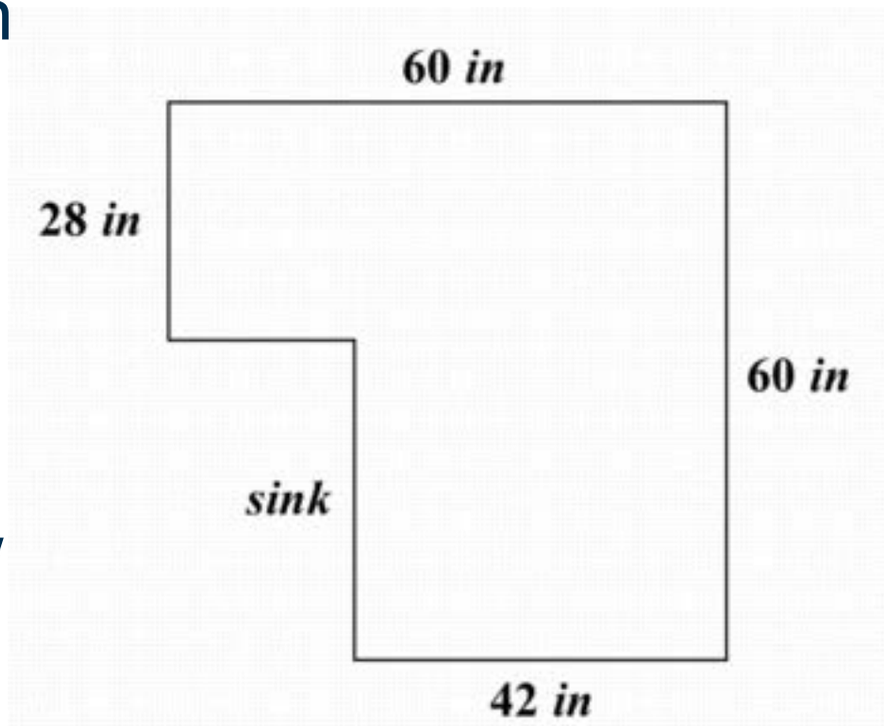
# Everyone Has Lots of Ideas

# **Table Talk:** What sorts of things do your tutees struggle with in school?

# **Table Talk:** What do you think when you hear someone is "good at math"?

# Teresa's Tiles

Teresa is going to put down new ceramic tiles on her bathroom floor. She has selected square tiles that are 4 inches on each side. These are the kind of tiles that can be placed right next to each other without leaving additional space for grout. At The Home Station, she learned how to cut the tiles in case she needs any fractional pieces to cover her floor completely.




This diagram of the bathroom floor shows the dimensions of the floor space she needs to cover. The sink area does not get tiled.

**Questions:** How many tiles will she need to buy to cover her floor? How many tiles will she have to cut in order to cover the entire space?

# Let's Talk About Making Sense of Math (and reading)

# Sample Grade 3 State Test Problem

The corner deli sells roses in bunches of 6. If Dylan buys 3 bunches of roses, how many roses does he have?

| | |
|---|---|
| A. 6 | 18% |
| B. 9 | 46% |
| C. 18 | 31% |
| D. 24 | 4% |

*Combined scores of the 160 third graders in a group of four low-performing schools I used to support.*

# Sample Test Problem, Revised

The corner deli sells roses in bunches of 6. Dylan bought 3 bunches. Draw a picture of the story.

# Reading Strategies – Unfamiliar Words

- Sound it out
- Context clues
- Apply known patterns to a new situations

# Reading Strategies – Comprehension

- Predicting
- Estimating
- Hypothesizing
- Make a movie in your mind
- Storyboarding (beginning, middle, end)
- Story elements (character, setting, problem, solution)

# Reading Strategies – Comprehension

- Make a movie in your mind

# Characteristics of Strong ~~Readers~~ Mathematicians

- They are motivated to ~~read~~. tackle problems
- They are able to ~~read words~~ accurately and automatically. recite facts
- They comprehend what they read.
- They are able to read with expression.
- They use a variety of strategies to tackle ~~words~~ problems they don't recognize.
- They use active problem solving strategies to search for information, to determine meaning, to make sense of words, to make connections.

# What Can YOU Do To Encourage Sense Making in Mathematics?

# Get Rid of The Question

Mr. Gavin has a ladder that is 100 centimeters tall.

Ms. Cornell has a ladder that is 2 meters tall.

How much taller is Ms. Cornell's ladder than Mr. Gavin's ladder?

# Get Rid of The Question

Mr. Gavin has a ladder that is 100 centimeters tall.

Ms. Cornell has a ladder that is 2 meters tall.

What do you notice about the story?
What do you wonder?

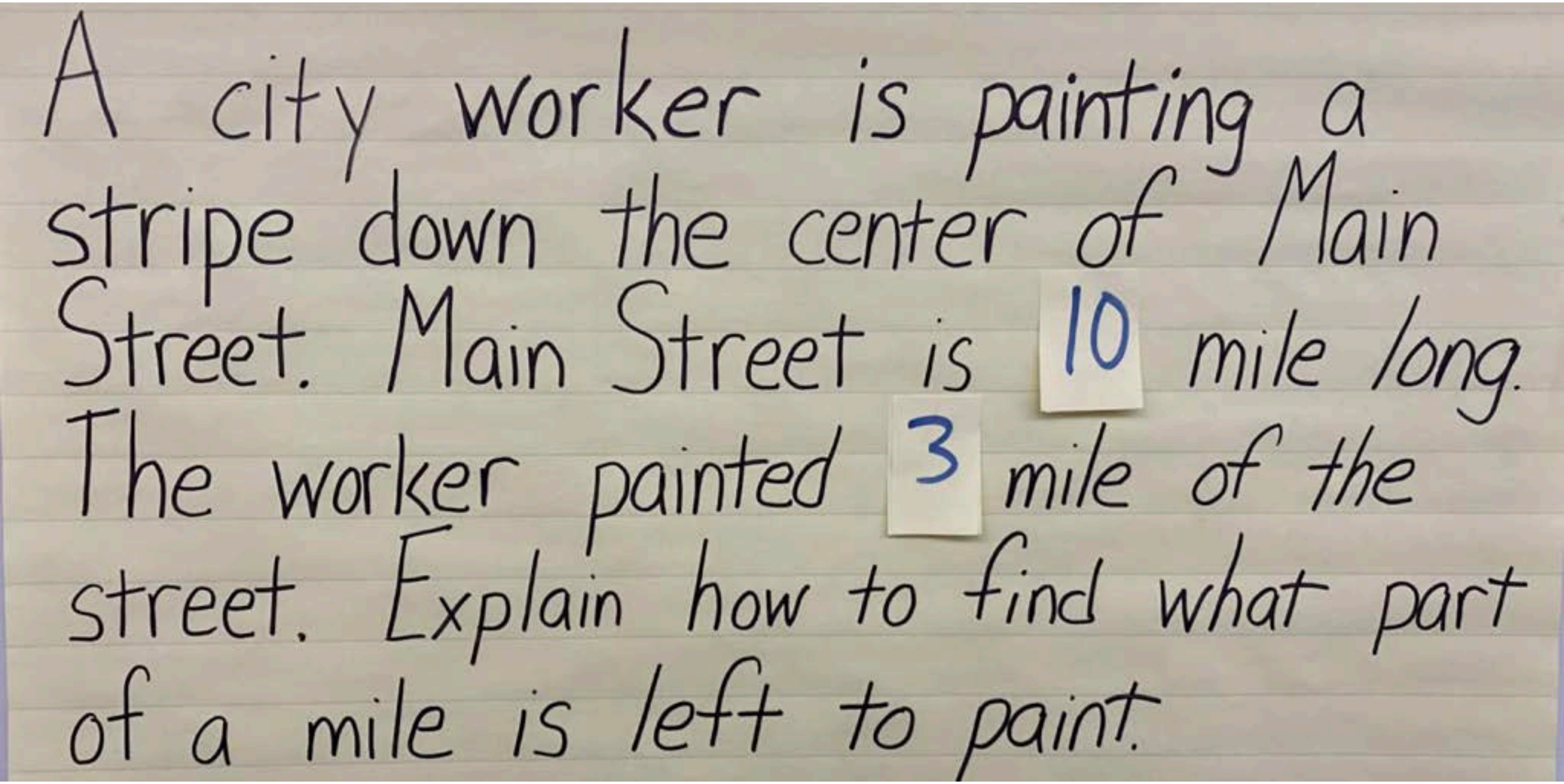
# Get Rid of The Numbers

A city worker is painting a stripe down the center of Main Street. Main Street is $\frac{8}{10}$ mile long. The worker painted $\frac{4}{10}$ mile of the street. Explain how to find what part of a mile is left to paint.

# Get Rid of The Numbers

A city worker is painting a stripe down the center of Main Street. Main Street is [ ] mile long. The worker painted [ ] mile of the street. Explain how to find what part of a mile is left to paint.

# Get Rid of The Numbers



# Ask About Ideas

Ask about ideas, not answers.

For example:

“Tell me something about question 7.”
instead of
“Tell me the answer to question 7.”

# Ask About Their Thinking

"Why?"

"How do you know?"

"How did you decide?"

"Tell me more about that."

**These are Questions You Don't Know The Answer To**

# The First Graders

# Neyanee

# Write down:

# One thing you've **noticed** about our session

# One thing you're **wondering**

# Reminder: Your tutee has math ideas.

# Your job is to make them believe that someone (you) wants to listen to those ideas.

# Thank You!