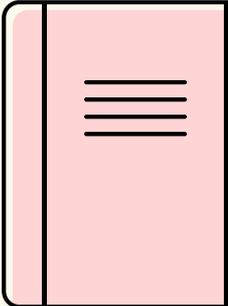
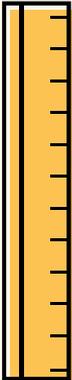
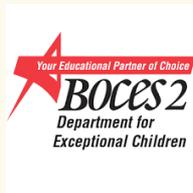


for the NYS Migrant Education Program



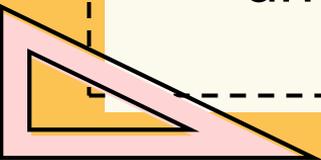
# Word Problems: Number Sense

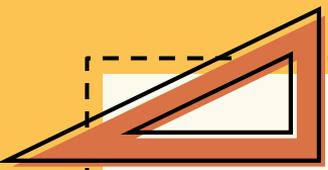


Tina Bonfiglio  
Math Instructional Specialist

# Essential Questions

- What are common pitfalls when teaching word problems?
- How do number sense skills help to solve word problems?
- What instructional strategies best teach students to understand and solve word problems?





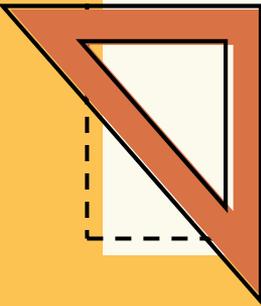
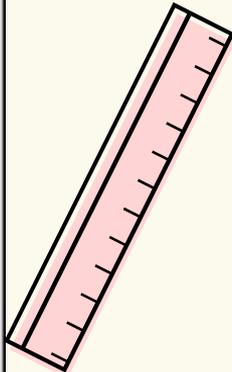
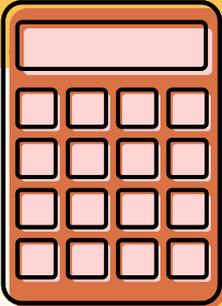
**Finish the  
sentence in the  
chat.**

A large blue-bordered chat bubble with a light blue background. It contains the text "Word problems are" in a bold, dark blue font. Below the text is a horizontal line with a small blue dot at its right end, indicating a space for a response. The bubble is decorated with four starburst icons: one orange star at the top center, one red star on the left side, one orange star on the right side, and one red star at the bottom center. There are also colorful wavy patterns in orange, blue, and red at the top right and bottom left corners of the bubble.

# DISTANCE/RATE/TIME WORD PROBLEMS

*Train 1 leaves the station going west at 80 miles per hour. 600 miles to the west, train 2 leaves the station going east at 40 miles per hour. If both trains leave at the same time, how long before they crash?*





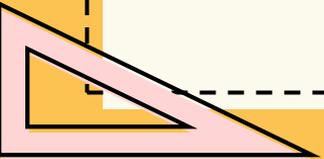
How I see math word problems: If you have 4 pencils and I have 7 apples, how many pancakes will fit on the roof? Purple, because aliens don't wear hats.



your  cards  
someecards.com

# Common Pitfalls

- Rushing/Misreading
- Ignoring Units
- Not Answering the Question



# Common Pitfalls

- Rushing/Misreading
- Ignoring Units
- Not Answering the Question
- Contextual Misunderstanding



assuming uniform operations, number plucking, keywords, charts/graphic organizers, CUBES, etc.

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- Ignoring Units
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assuming uniform operations, number plucking, **keywords**,  
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# No CUBES

**WORD PROBLEMS**  
CUBES STRATEGY FOR US  
SOLVE WORD PROBLEMS

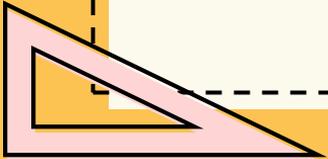
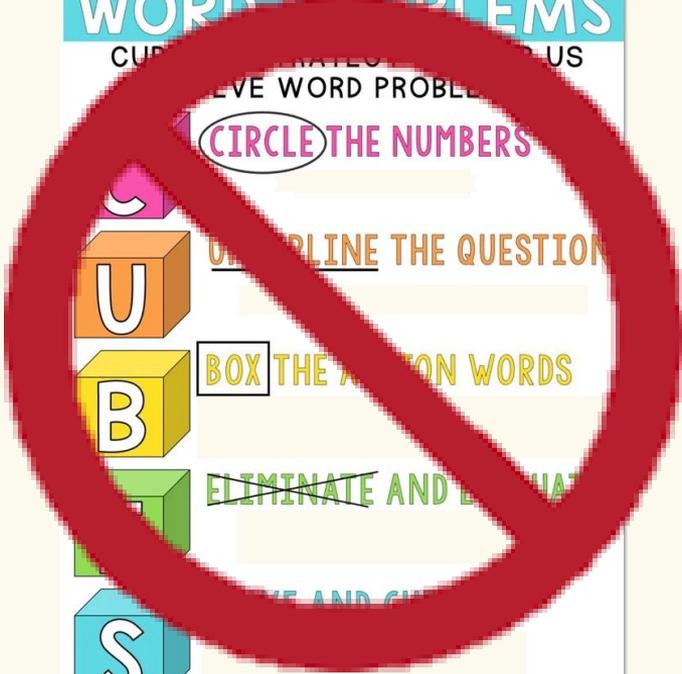
**CIRCLE THE NUMBERS**

**UNDERLINE THE QUESTION**

**BOX THE KEY WORDS**

**ELIMINATE AND EVALUATE**

**WRITE AND CHECK**



# No CUBES

Just say NO to CUBES!

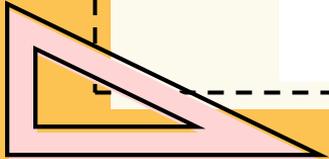
- C** Circle all the numbers in the problem
- U** Underline the question
- B** Box the key words
- E** Eliminate and evaluate
- S** Solve and check



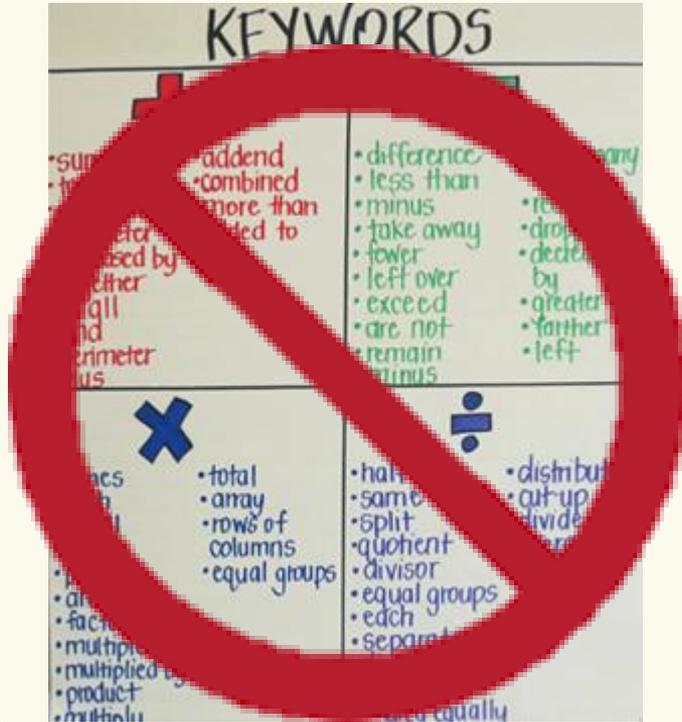
$$198 + 36 + 8$$

*Right? Wrong!*

Planet WorkOut sold 198 premium memberships during their grand opening special. The cost of the premium membership is \$36, which is an \$8 increase from last year's price. How much money did Planet WorkOut take in during the grand opening special?



# No Keywords



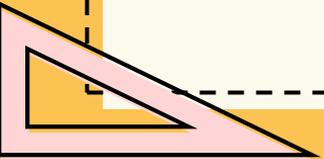
“Relying on keywords leads to the correct operation **less than 50% of the time for single-step problems, and less than 10% for multi-step problems.**”

Powell, Namkung, and Lin (2022)

# No Keywords

## Reason #1

It doesn't encourage students  
to analyze the problem and  
make sense of it.



# No Key Words

## Reason #2

Key words are often misleading.

There are 3 lines of students waiting at the counter in the cafeteria. Each line has 5 students. How many students are there in all?

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$$3 + 5 = 8$$

8 students

KEYWORDS			
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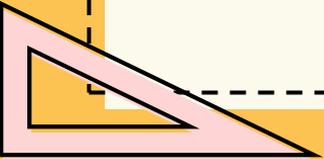
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Jose has a pan of brownies that is  $\frac{1}{2}$  eaten.

He eats  $\frac{1}{4}$  of the brownies in the pan. What fraction of the brownies is left in the pan?



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$$\frac{1}{2} - \frac{1}{4} \rightarrow \frac{2}{4} - \frac{1}{4} = \frac{1}{4}$$

~~$\frac{1}{4}$~~  of the brownies are left in the pan

KEYWORDS			
<b>+</b>	<b>-</b>	<b>×</b>	<b>÷</b>
<ul style="list-style-type: none"><li>• sum</li><li>• total</li><li>• altogether</li><li>• perimeter</li><li>• increased by</li><li>• together</li><li>• in all</li><li>• and</li><li>• perimeter</li><li>• plus</li></ul>	<ul style="list-style-type: none"><li>• addend</li><li>• combined</li><li>• more than</li><li>• added to</li></ul>	<ul style="list-style-type: none"><li>• difference</li><li>• less than</li><li>• minus</li><li>• take away</li><li>• fewer</li><li>• left over</li><li>• exceed</li><li>• are not</li><li>• remain</li><li>• minus</li></ul>	<ul style="list-style-type: none"><li>• how many</li><li>• more</li><li>• reduced by</li><li>• dropped</li><li>• decreased by</li><li>• greater than</li><li>• another</li><li>• left</li></ul>
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# No Key Words

## Reason #3

Many word problems have no key words.

Aidan has 28 goldfish. 14 are orange and the rest are yellow. How many goldfish are yellow?



KEYWORDS			
<b>+</b> <ul style="list-style-type: none"><li>• sum</li><li>• total</li><li>• altogether</li><li>• perimeter</li><li>• increased by</li><li>• together</li><li>• in all</li><li>• and</li><li>• perimeter</li><li>• plus</li></ul>	<ul style="list-style-type: none"><li>• addend</li><li>• combined</li><li>• more than</li><li>• added to</li></ul>	<ul style="list-style-type: none"><li>• difference</li><li>• less than</li><li>• minus</li><li>• take away</li><li>• fewer</li><li>• left over</li><li>• exceed</li><li>• are not</li><li>• remain</li><li>• minus</li></ul>	<ul style="list-style-type: none"><li>• how many</li><li>• more</li><li>• reduced by</li><li>• dropped</li><li>• decreased by</li><li>• greater than</li><li>• farther</li><li>• left</li></ul>
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# No Key Words

## Reason #4

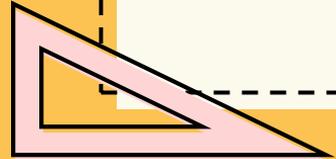
Key words don't work with two-step or more advanced problems.

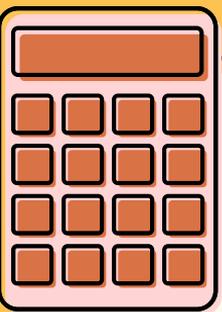
A local gym offers 2 membership plans. Plan A costs a flat fee of \$50 plus \$15 per month. Plan B costs a flat fee of \$20 plus \$20 per month. After how many months will the total cost of the 2 plans be the same, and what is that cost?



KEYWORDS			
<b>+</b>	<b>+</b>	<b>-</b>	<b>÷</b>
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# Context is King





# What can we do?



## Number Sense

Build students' number sense so they can make estimates and determine the reasonableness of their answers.



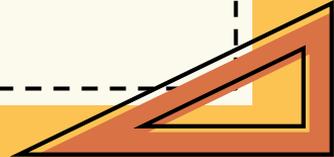
## Model

Teach students to visualize and model the situation presented in word problems using manipulatives and/or drawings.



## Strategies

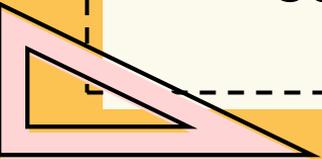
Equip students with a variety of strategies (not procedures) to solve word problems.



# Number Sense

Helps to:

- Estimate
- Check for reasonableness
- Visualize relationship between numbers
- Be flexible and strategize- allows for multiple approaches to solving, breaking down larger numbers etc.
- Concentrate on context versus computation



# Number Sense

There are 48 students going on a field trip. Each van holds 9 students. How many vans are needed?

## Strong Number Sense

*“9 is almost 10, so 48 is a little less than 5 groups of 10. That means we need a bit more than 5 vans.”*

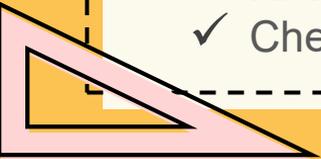
*“Let me try:  $9 \times 5 = 45$ , so 5 vans won't hold everyone. We need 1 more.”*

**Answer: 6 vans**

Student checks: *“ $6 \times 9 = 54$ , which fits 48 students.”*

## What this shows:

- ✓ Uses estimation first
- ✓ Knows multiplication facts flexibly
- ✓ Checks answer with a sense of magnitude



# Number Sense

There are 48 students going on a field trip. Each van holds 9 students. How many vans are needed?

## Limited Number Sense

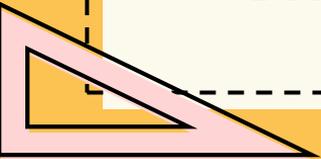
*"I divided  $48 \div 9$  and got 5.3, so I guess the answer is 5."*

*No check or reasoning about real-world meaning*

*Doesn't convert a decimal result into a real-world answer*

## **What this shows:**

- × Blindly trusts calculator or procedure
- × Doesn't reason about what answer makes sense
- × Doesn't connect math to context



# Number Sense

Mia has 125 stickers. She gives 38 to her friend. How many does she have left?

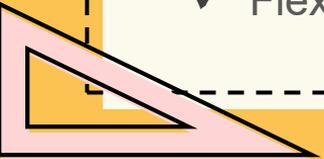
## Strong Number Sense

*" $125 - 40 = 85$ . Since I took away 2 too many, I'll add 2 back. The answer is 87."*

*"I can decompose  $125 - 30 = 95$ , then  $95 - 8 = 87$ ."*

## What this shows:

- ✓ Use of friendly numbers
- ✓ Use of decomposition
- ✓ Flexibility with numbers



# Number Sense

Mia has 125 stickers. She gives 38 to her friend. How many does she have left?

## Limited Number Sense

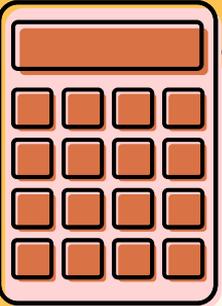
*"I lined up the digits and subtracted. I borrowed, I think...I got 107."*

*Didn't estimate first*

*Doesn't catch that 125 minus about 40 cannot be over 100.*

## **What this shows:**

- × Uses only remote algorithm
- × No estimation
- × Doesn't recognize an unreasonable answer
- × Dependent on procedural steps



# What can we do?



## Number Sense

Build students' number sense so they can make estimates and determine the reasonableness of their answers.



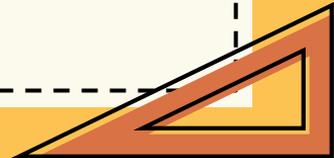
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# Model

Visualize using CRA: Concrete, Representational, Abstract



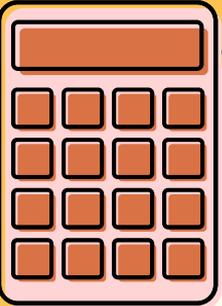
One tin has 84 biscuits. Another has 48. 97 are eaten. How many are left?

Total biscuits	
First tin	Second tin
Eaten	Left
84	48
97	?

Number of Steps	1	2	3	4	5	6
Number of cubes	1	3	6	10		
	$1+2=3$	$3+3=6$	$6+4=10$	$10+5=15$	$15+6=21$	
	+2	+3	+4	+5	+6	

You are buying candy bars online. They cost \$1.50 each and there is a \$3.50 shipping fee. You have \$29 to spend. How many candy bars can you get?

$$\begin{aligned} 1.5x + 3.5 &= 29 \\ -3.5 \quad -3.5 & \\ \hline 1.5x &= 25.5 \\ \frac{1.5x}{1.5} &= \frac{25.5}{1.5} \\ \hline x &= 17 \text{ candy bars} \end{aligned}$$



# What can we do?



## Number Sense

Build students' number sense so they can make estimates and determine the reasonableness of their answers.



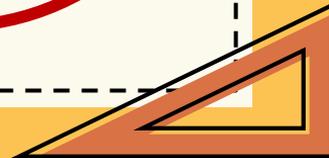
## Model

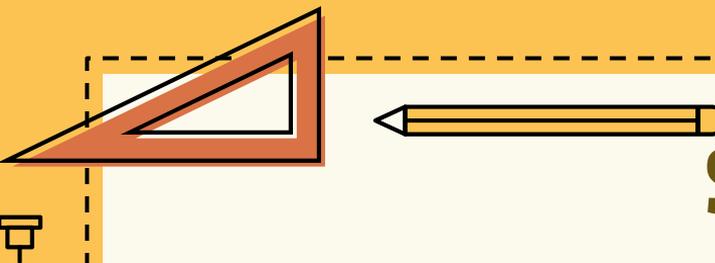
Teach students to visualize and model the situation presented in word problems using manipulatives and/or drawings.



## Strategies

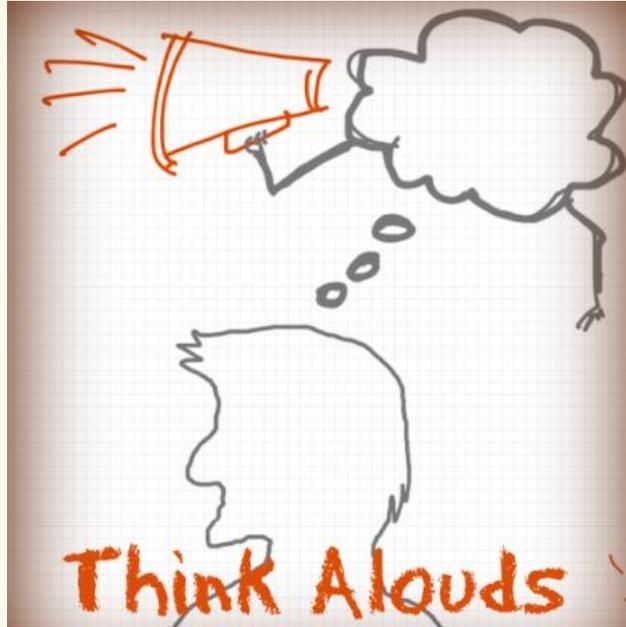
Equip students with a variety of strategies (not procedures) to solve word problems.

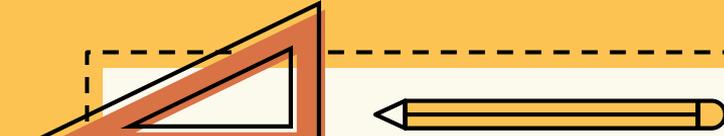




# Strategies

## Think Alouds





# Strategies

## Retell



# Strategies

## 3 Reads Protocol

1

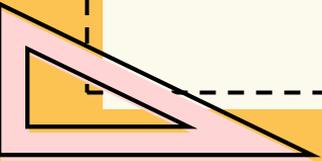
Read  
for  
context

2

Read to  
understand  
the quantities  
and their  
relationships

3

Read to  
determine  
what  
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questions we  
could answer



# Strategies

## 3 Reads Protocol

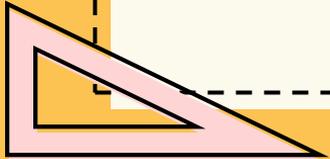
### READ 1: READ FOR CONTEXT

Ayriale and Natassja picked flowers from the community garden. Ayriale picked roses, daisies, and daffodils from the garden. Natassja picked daisies and lilies.

What is this story about?

- Characters
- Setting
- Plot

**No numbers, no question**



# Strategies

## 3 Reads Protocol

### READ 2: READ TO UNDERSTAND QUANTITIES

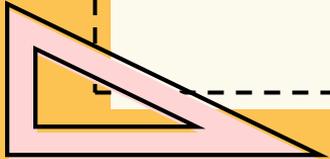
Ayriale and Natassja picked flowers from the community garden. Ayriale picked 8 roses, 5 daisies, and 7 daffodils from the garden. Natassja picked 10 daisies and 12 lilies.

**Numbers added, no question**

What are the numbers in the story?

What do they mean?

How are they related?



# Strategies

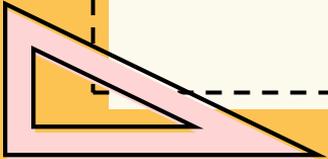
## 3 Reads Protocol

### READ 3: READ TO DETERMINE THE QUESTION

Ayriale and Natassja picked flowers from the community garden. Ayriale picked 8 roses, 5 daisies, and 7 daffodils from the garden. Natassja picked 10 daisies and 12 lilies.

What mathematical questions could we answer using the information in this problem?

Still no question



# Strategies

## 3 Reads Protocol

Ayriale and Natassja picked flowers from the community garden. Ayriale picked 8 roses, 5 daisies, and 7 daffodils from the garden. Natassja picked 10 daisies and 12 lilies.

**How many flowers were picked altogether?**

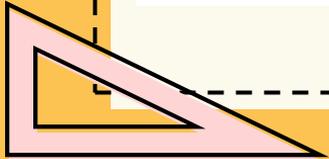
What is my estimate?

What number would be too low?

What would be too high?

~ 40 flowers total

Ayriale	Natassja
8 roses	10 daisies
5 daisies	12 lilies
7 daffodils	
Ayriale's Total: 20	Natassja's Total: 22
$20 + 22 = 42$ flowers	

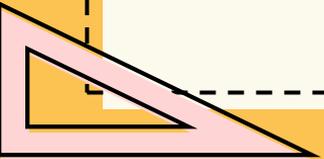


# Strategies

## 3 Reads Protocol

To clarify: We aren't teaching students to ignore numbers in a word problem.

(That would be nearly impossible!)



# Strategies

## 3 Reads Protocol

1

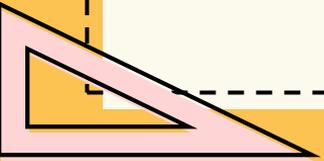
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Read to  
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# Strategies

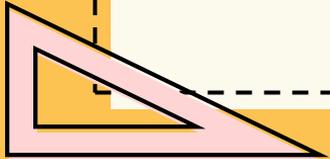
## 3 Reads Protocol Example 1

Elisha loses some teeth in first grade. In second grade she loses more teeth.

### READ 1: READ FOR CONTEXT

What is this story about?

- Characters
- Setting
- Plot

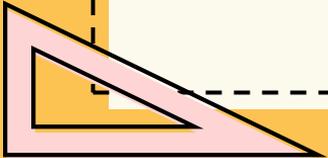
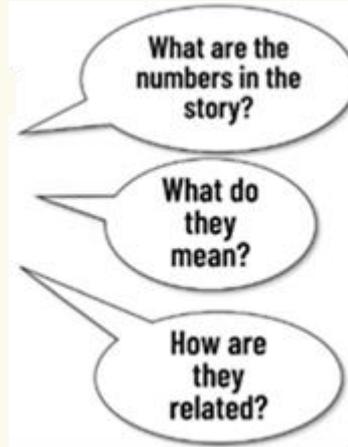


# Strategies

## 3 Reads Protocol Example 1

Elisha loses 4 teeth in first grade. In second grade she loses 3 more teeth.

### READ 2: READ TO UNDERSTAND QUANTITIES



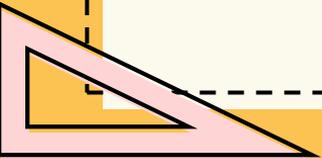
# Strategies

## 3 Reads Protocol Example 1

Elisha loses 4 teeth in first grade. In second grade she loses 3 more teeth.

**READ 3: READ TO DETERMINE THE QUESTION**

What mathematical questions could we answer using the information in this problem?



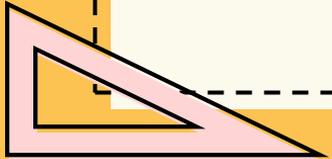
# Strategies

## 3 Reads Protocol Example 1

Elisha loses 4 teeth in first grade. In second grade she loses 3 more teeth. How many teeth does Elisha lose?



$$4 + 3 = 7$$



# Strategies

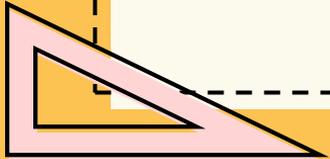
## 3 Reads Protocol Example 2

Edward served at the local food bank by putting together food boxes that go to senior citizens. Each box contains some meals. The boxes are loaded onto pallets that each hold some number of boxes.

### READ 1: READ FOR CONTEXT

What is this story about?

- Characters
- Setting
- Plot

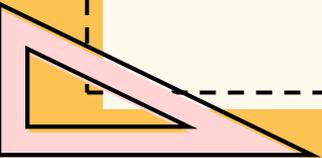
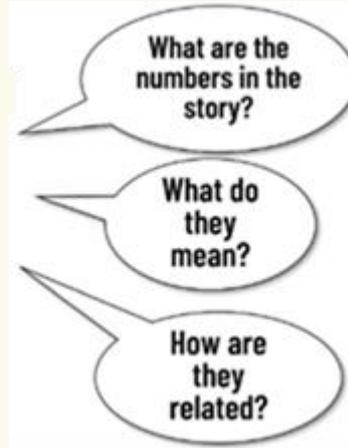


# Strategies

## 3 Reads Protocol Example 2

Edward served at the local food bank by putting together food boxes that go to senior citizens. Each box contains 26 meals. The boxes are loaded onto 22 pallets that each hold 45 boxes.

### READ 2: READ TO UNDERSTAND QUANTITIES



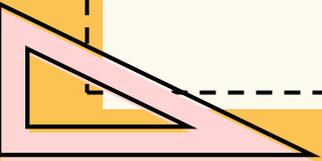
# Strategies

## 3 Reads Protocol Example 2

Edward served at the local food bank by putting together food boxes that go to senior citizens. Each box contains 26 meals. The boxes are loaded onto 22 pallets that each hold 45 boxes.

### READ 3: READ TO DETERMINE THE QUESTION

What mathematical questions could we answer using the information in this problem?



# Strategies

## 3 Reads Protocol

### Example 2

Edward served at the local food bank by putting together food boxes that go to senior citizens. Each box contains 26 meals. The boxes are loaded onto 22 pallets that each hold 45 boxes. How many meals did Edward help put together?

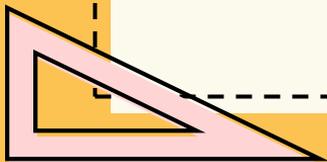


**26 meals x 45 boxes x 22 pallets = 25,740 meals**

# Strategies

Numberless  
Word Problems

[www.numberlesswp.com](http://www.numberlesswp.com)



# Think Aloud #1

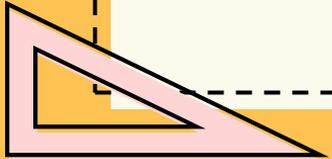
## 3 Reads Protocol

Jose has a pan of brownies that is  $\frac{1}{2}$  eaten. He eats  $\frac{1}{4}$  of the brownies in the pan. What fraction of the brownies is left in the pan?

### READ 1: READ FOR CONTEXT

What is this story about?

- Characters
- Setting
- Plot



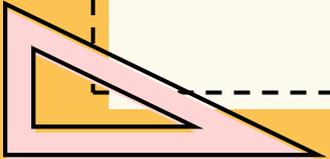
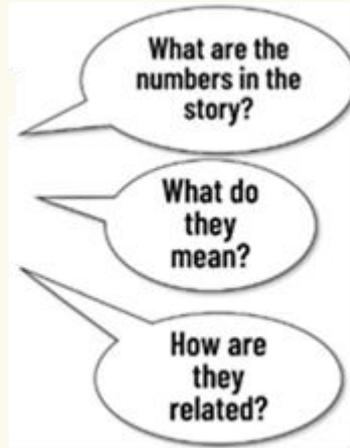
# Think Aloud #1

## 3 Reads Protocol



### READ 2: READ TO UNDERSTAND QUANTITIES

Jose has a pan of brownies that is  $\frac{1}{2}$  eaten. He eats  $\frac{1}{4}$  of the brownies in the pan. What fraction of the brownies is left in the pan?



# Think Aloud #1

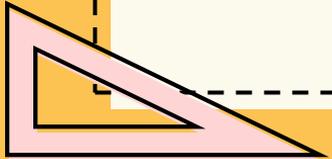
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### READ 3: READ TO DETERMINE THE QUESTION

Jose has a pan of brownies that is  $\frac{1}{2}$  eaten. He eats  $\frac{1}{4}$  of the brownies in the pan. What fraction of the brownies is left in the pan?

What mathematical questions could we answer using the information in this problem?



# Think Aloud #1

## Estimate

Jose has a pan of brownies that is

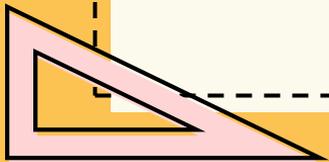
$\frac{1}{2}$  eaten. He eats  $\frac{1}{4}$  of the brownies

in the pan. What fraction of the

brownies is left in the pan?

Using number sense skills to estimate...

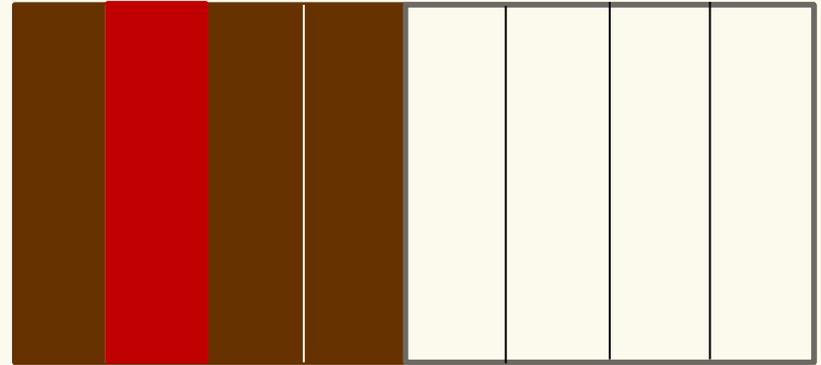
*“There was  $\frac{1}{2}$  pan of brownies to begin with and Jose ate  $\frac{1}{4}$  of them so there’s less than  $\frac{1}{2}$  left.”*



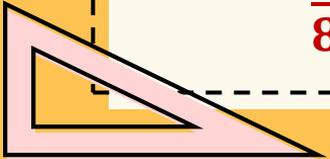
# Think Aloud #1

## Modeling

Jose has a pan of brownies that is  $\frac{1}{2}$  eaten. He eats  $\frac{1}{4}$  of the brownies in the pan. What fraction of the brownies is left in the pan?



$\frac{3}{8}$  of the pan



# Think Aloud #1

## Determine Reasonableness

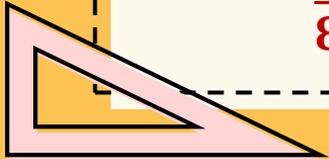
Jose has a pan of brownies that is  $\frac{1}{2}$  eaten. He eats  $\frac{1}{4}$  of the brownies in the pan. What fraction of the brownies is left in the pan?

$\frac{3}{8}$  of the pan

Using number sense skills to determine the reasonableness of the answer...

*“ $\frac{3}{8}$  is less than  $\frac{1}{2}$  like I estimated.”*

*“ $\frac{1}{2}$  was already eaten, Jose ate  $\frac{1}{4}$  of  $\frac{1}{2}$  or  $\frac{1}{8}$ .  $\frac{1}{2} + \frac{1}{8} = \frac{4}{8} + \frac{1}{8} = \frac{5}{8}$  That’s how much was eaten which means  $\frac{3}{8}$  is left.”*



# Think Aloud #2

## 3 Reads Protocol

Lori uses 12 pounds of turkey to make 60 sandwiches. Each sandwich has the same amount of turkey. What is the total amount of turkey in each sandwich?

### READ 1: READ FOR CONTEXT

What is this story about?

- Characters
- Setting
- Plot

2025 NYS Mathematics Test Grade 5

# Think Aloud #2

## 3 Reads Protocol

### READ 2: READ TO UNDERSTAND QUANTITIES

Lori uses 12 pounds of turkey to make 60 sandwiches. Each sandwich has the same amount of turkey. What is the total amount of turkey in each sandwich?

What are the numbers in the story?

What do they mean?

How are they related?

2025 NYS Mathematics Test Grade 5

# Think Aloud #2

## 3 Reads Protocol

### READ 3: READ TO DETERMINE THE QUESTION

Lori uses 12 pounds of turkey to make 60 sandwiches. Each sandwich has the same amount of turkey. What is the total amount of turkey in each sandwich?

What mathematical questions could we answer using the information in this problem?

2025 NYS Mathematics Test Grade 5

# Think Aloud #2

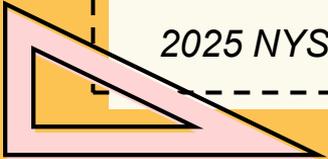
## Estimate

Lori uses 12 pounds of turkey to make 60 sandwiches. Each sandwich has the same amount of turkey. What is the total amount of turkey in each sandwich?

Using number sense skills to estimate...

*“If there was 1 pound of turkey in each sandwich that would be 60 pounds. And we only have 12, so the answer is less than one pound. It’s a lot less than one pound.”*

2025 NYS Mathematics Test Grade 5

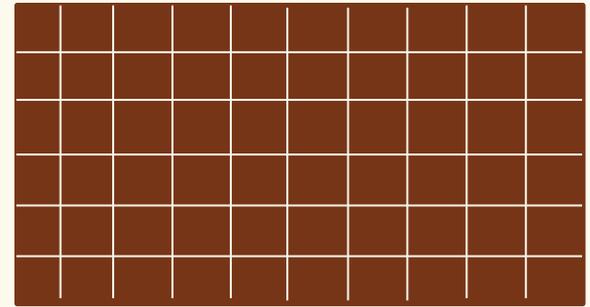


# Think Aloud #2

## Modeling

Lori uses 12 pounds of turkey to make 60 sandwiches. Each sandwich has the same amount of turkey. What is the total amount of turkey in each sandwich?

Using modeling...



12

2025 NYS Mathematics Test Grade 5

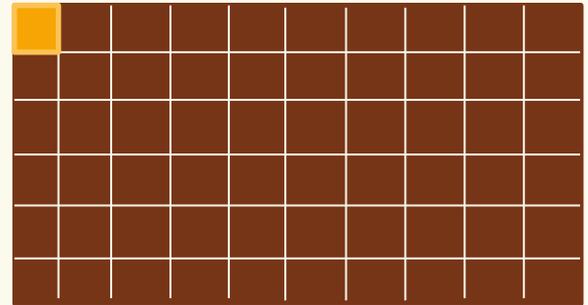
# Think Aloud #2

## Modeling

Lori uses 12 pounds of turkey to make 60 sandwiches. Each sandwich has the same amount of turkey. What is the total amount of turkey in each sandwich?

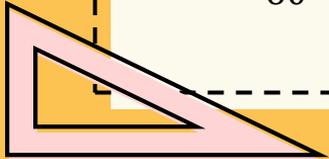
$$\frac{1}{60} \times 12 \rightarrow \frac{1}{60} \times \frac{12}{1} = \frac{12}{60} \text{ or } \frac{1}{5} \text{ pound}$$

Using modeling...



**12**

$$\text{Yellow square} = \frac{1}{60}$$



# Think Aloud #2

## Determine Reasonableness

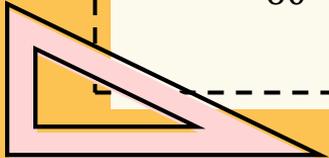
Lori uses 12 pounds of turkey to make 60 sandwiches. Each sandwich has the same amount of turkey. What is the total amount of turkey in each sandwich?

$$\frac{1}{60} \times 12 \rightarrow \frac{1}{60} \times \frac{12}{1} = \frac{12}{60} \text{ or } \frac{1}{5} \text{ pound}$$

Using number sense skills to determine the reasonableness of the answer...

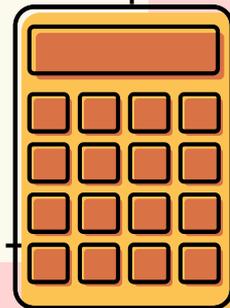
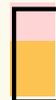
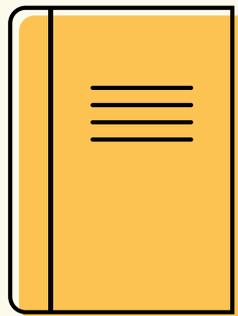
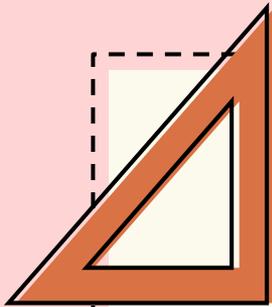
*“1/5 is a lot less than one like I estimated.”*

*“1/5 pound of turkey times 60 sandwiches means 1/5x60 which is 12.”*



# Try it!

Gayle earns 32 tickets at an event. She uses all of her tickets to buy 4 prizes and uses the same number of tickets to buy each prize. How many tickets does Gayle use to buy each prize?



# Try it!

Gayle earns 32 tickets at an event. She uses all of her tickets to buy 4 prizes and uses the same number of tickets to buy each prize. How many tickets does Gayle use to buy each prize?

## READ 1: READ FOR CONTEXT

What is this story about?

- Characters
- Setting
- Plot

# Try it!

## READ 2: READ TO UNDERSTAND QUANTITIES

Gayle earns 32 tickets at an event. She uses all of her tickets to buy 4 prizes and uses the same number of tickets to buy each prize. How many tickets does Gayle use to buy each prize?

What are the numbers in the story?

What do they mean?

How are they related?

# Try it!

## READ 3: READ TO DETERMINE THE QUESTION

Gayle earns 32 tickets at an event. She uses all of her tickets to buy 4 prizes and uses the same number of tickets to buy each prize. How many tickets does Gayle use to buy each prize?

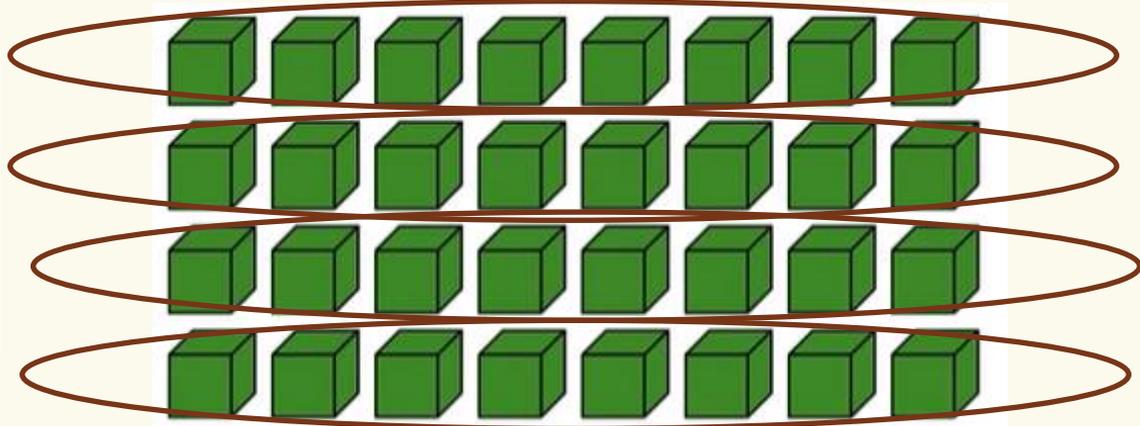
What mathematical questions could we answer using the information in this problem?

# Try it!

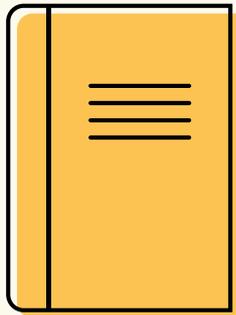
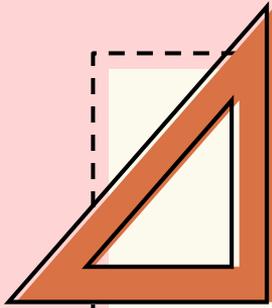
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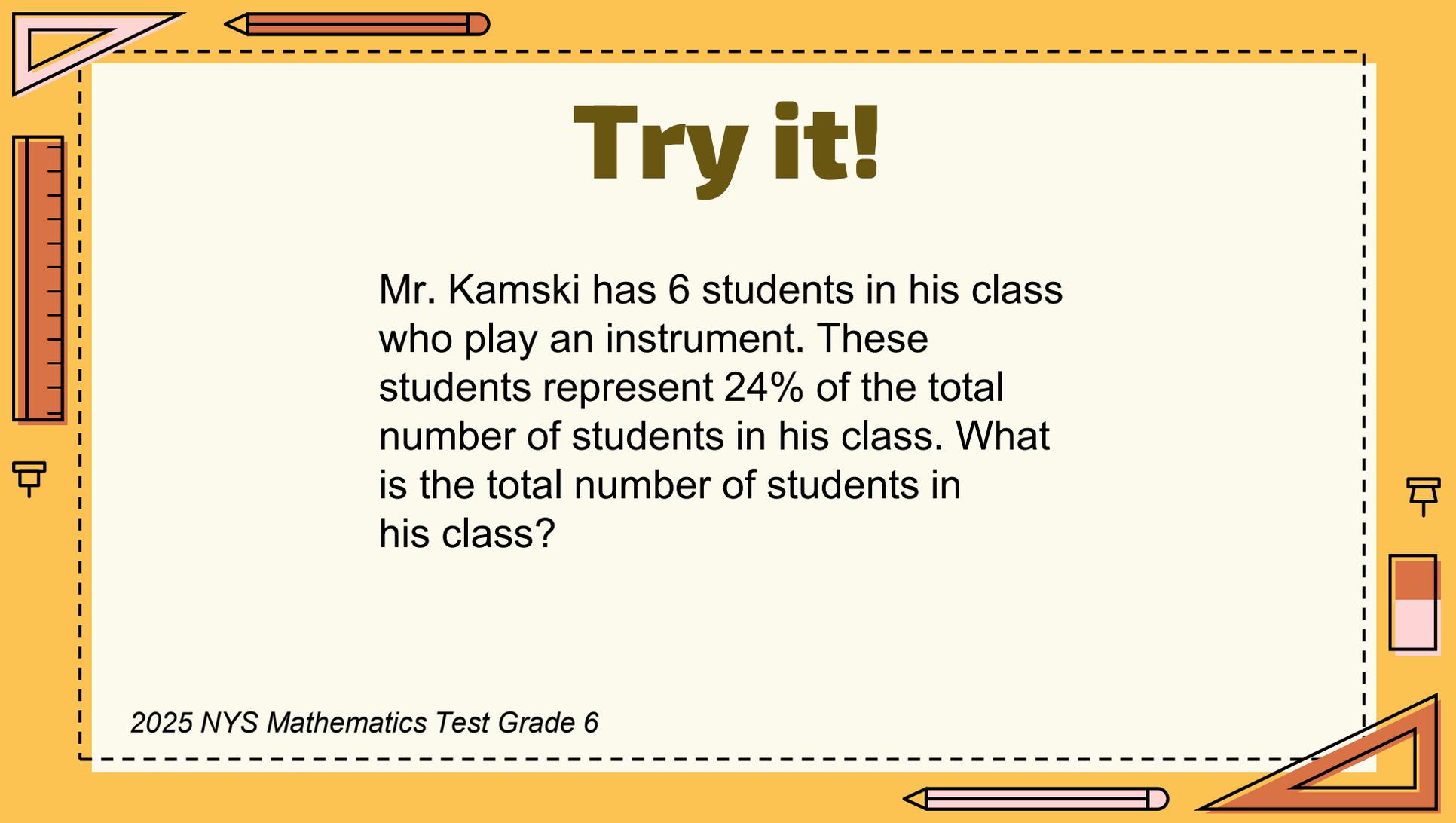
## What next?

# Try it!



$$32 \div 4 = 8 \text{ tickets}$$





# Try it!

Mr. Kamski has 6 students in his class who play an instrument. These students represent 24% of the total number of students in his class. What is the total number of students in his class?

*2025 NYS Mathematics Test Grade 6*

# Try it!

Mr. Kamski has 6 students in his class who play an instrument. These students represent 24% of the total number of students in his class. What is the total number of students in his class?

## READ 1: READ FOR CONTEXT

What is this story about?

- Characters
- Setting
- Plot

# Try it!

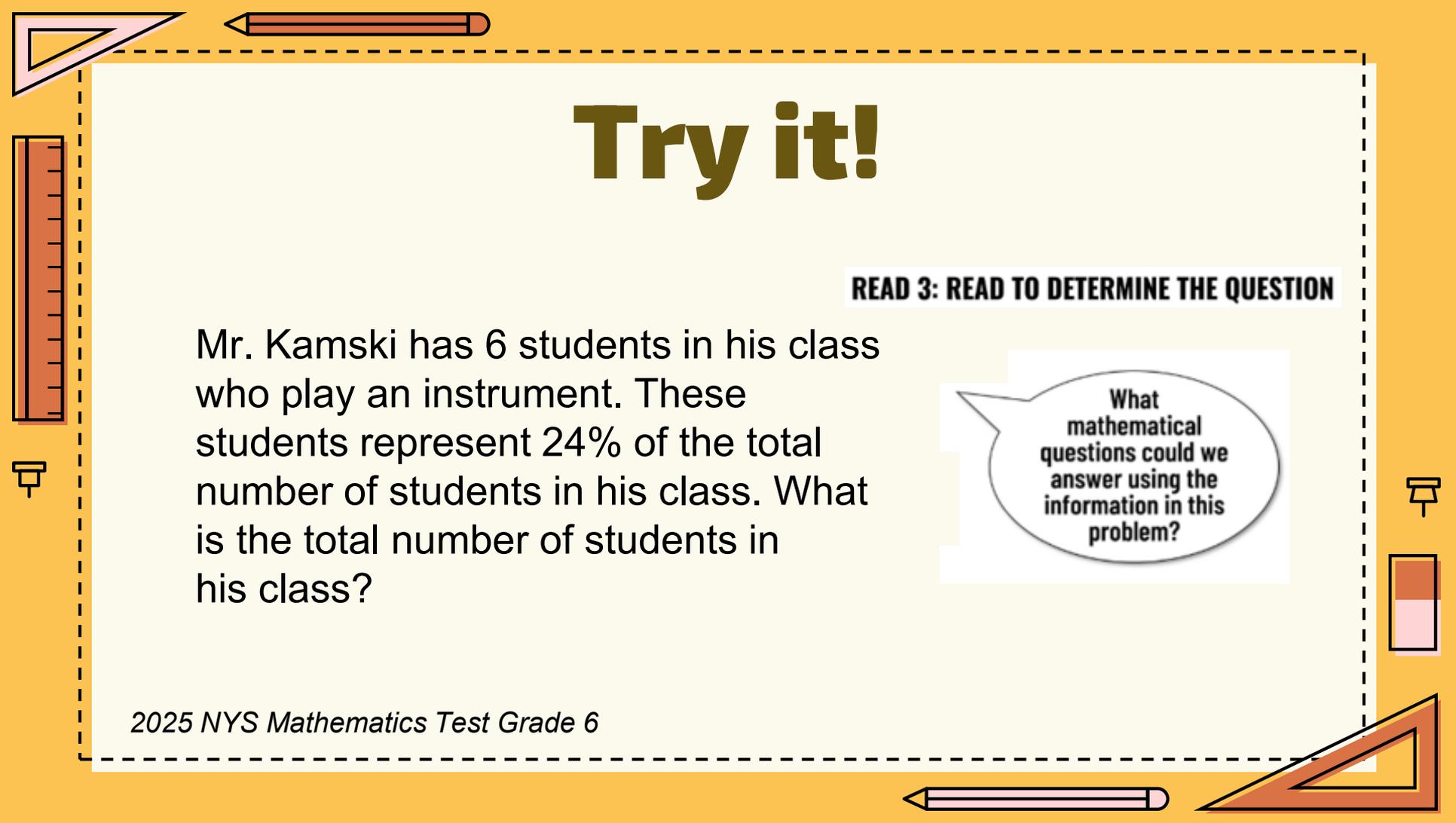
## READ 2: READ TO UNDERSTAND QUANTITIES

Mr. Kamski has 6 students in his class who play an instrument. These students represent 24% of the total number of students in his class. What is the total number of students in his class?

What are the numbers in the story?

What do they mean?

How are they related?

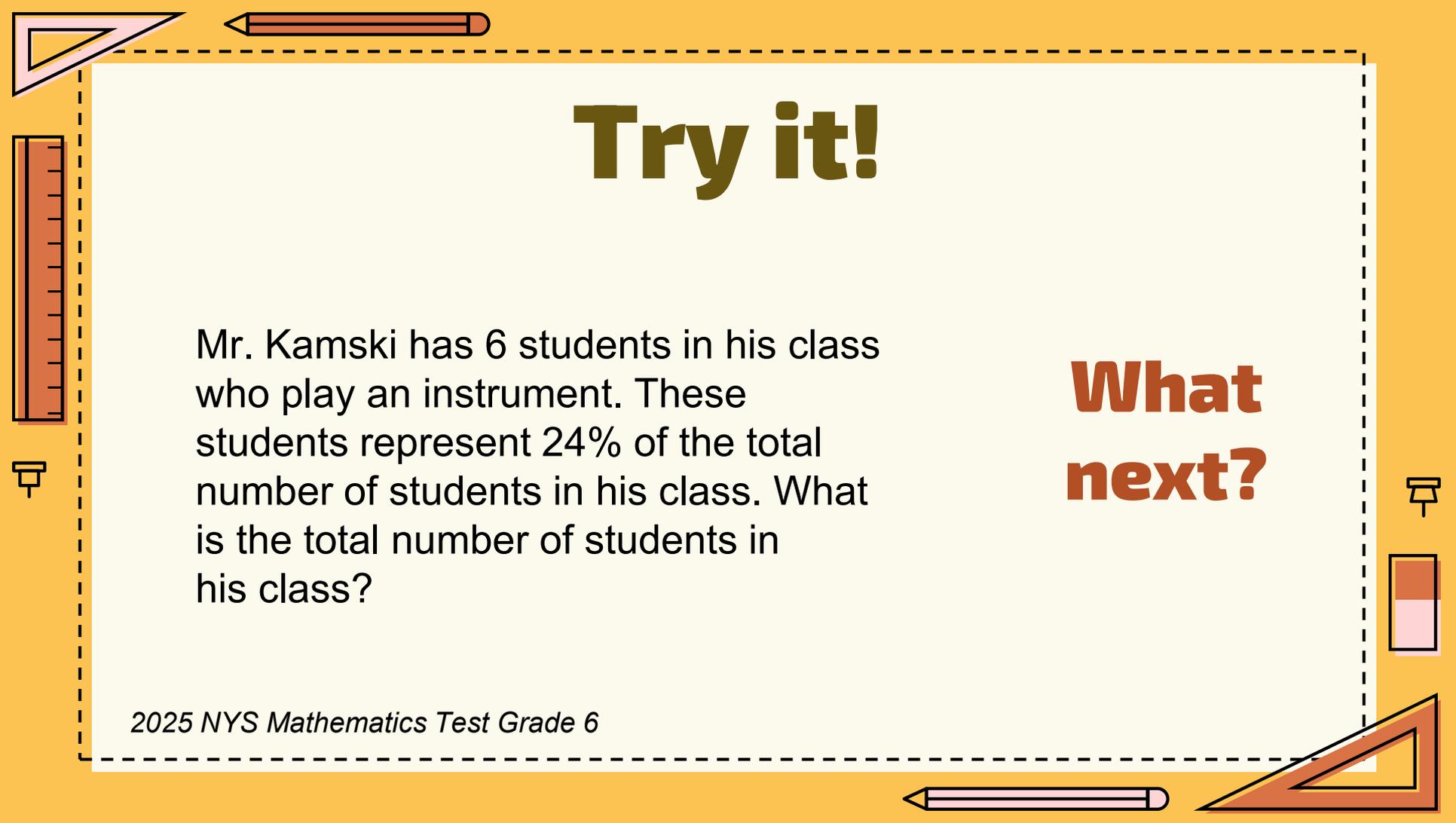


# Try it!

## READ 3: READ TO DETERMINE THE QUESTION

Mr. Kamski has 6 students in his class who play an instrument. These students represent 24% of the total number of students in his class. What is the total number of students in his class?

What mathematical questions could we answer using the information in this problem?



# Try it!

Mr. Kamski has 6 students in his class who play an instrument. These students represent 24% of the total number of students in his class. What is the total number of students in his class?

## What next?

# Try it!



Whole class = 100%

**Estimate: between 18 and 30 students**



= 6 students



# Try it!

*Modeling and  
number sense*



6 students = 24%



12 students = 48%

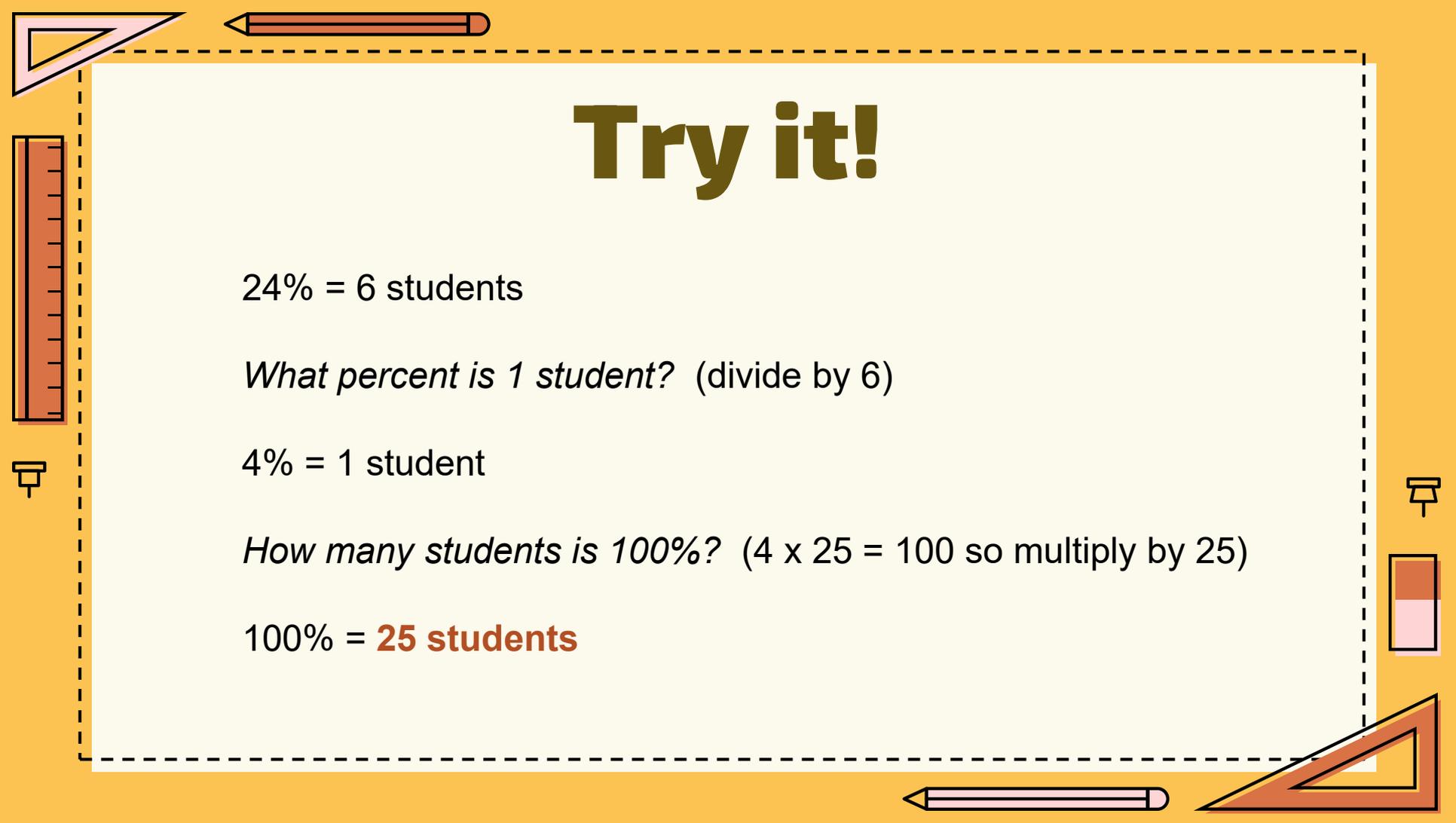


18 students = 72%



24 students = 96%

**Estimate: a little more than 24 students**



# Try it!

24% = 6 students

*What percent is 1 student?* (divide by 6)

4% = 1 student

*How many students is 100%?* ( $4 \times 25 = 100$  so multiply by 25)

100% = **25 students**

# Other Strategies

to improve student success with word problems and number sense

**Open-Ended  
Rich Math Tasks**

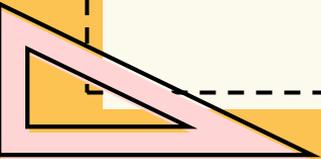
Math For Love – Grades PK-10

youcubed – Grades K-12

Open Middle – Grades K-12

Estimation 180 – Grades 2-10

NRICH – Grades PK-12



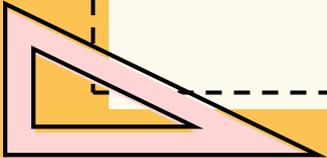
# Other Strategies

to improve student success with word problems and number sense

**Open-Ended  
Rich Math Tasks**

## Example

Julia picked 30 oranges at Citrus Groves. She wants to pack the oranges into boxes so she can bring them home, but she also wants an equal number of oranges per box. Show three different ways that Julia can pack the 30 oranges.



# Other Strategies

to improve student success with word problems and number sense



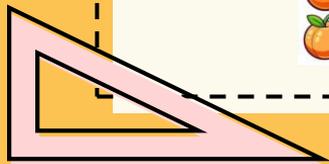
5 boxes of 6 oranges



10 boxes of 3 oranges



2 boxes of 15 oranges



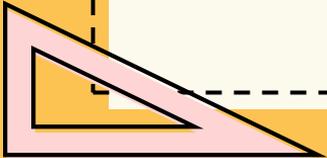
# Other Strategies

to improve student success with word problems and number sense

**Open-Ended  
Rich Math Tasks**

## Example

Benita has some Pokemon cards. Her brother has 4 times as many Pokemon cards as she does. Together, they have between 20 and 40 Pokemon cards. How many Pokemon cards could Benita have?



# Other Strategies

to improve student success with word problems and number sense

## Trial and Error

If Benita has 2, her brother would have  $2 \times 4$  or 8.  $2 + 8 = 10$  which is not enough.

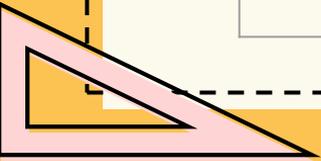
If Benita has 4, her brother would have  $4 \times 4$  or 16.  $4 + 16 = 20$  which is within range. So Benita could have 4 Pokemon cards.



# Other Strategies

to improve student success with word problems and number sense

Benita	Her Brother	Total
1	4	5
2	8	10
3	12	15
4	16	20
5	20	25
6	24	30
7	28	35
8	32	40



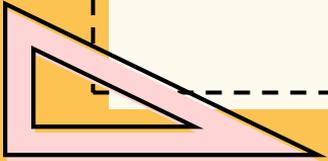
# Other Strategies

to improve student success with word problems and number sense

**Open-Ended  
Rich Math Tasks**

## Example

A rectangular prism has a volume of 144 cubic units and a base of 48 square units. What could one set of possible dimensions be?



# Other Strategies

to improve student success with word problems and number sense

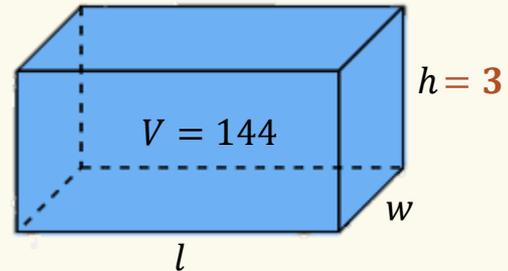
$$V = Bxh \text{ or } V = lwxh$$

$$V = 144$$

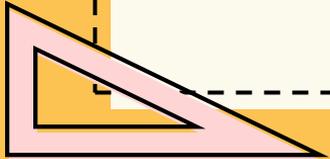
$$B = 48 \text{ or } lwx = 48$$

$$144 \div 48 = 3$$

$$h = 3 \text{ units}$$



$$B \text{ or } lwx = 48$$



# Other Strategies

to improve student success with word problems and number sense

$$h = 3 \text{ units}$$

$$l \times w = 48$$

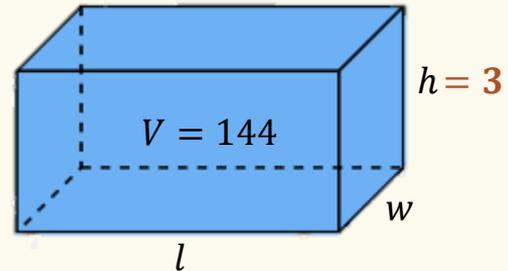
$$1 \times 48$$

$$2 \times 24$$

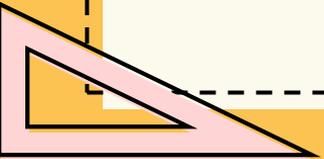
$$3 \times 16$$

$$4 \times 12$$

$$6 \times 8$$



$$B \text{ or } l \times w = 48$$



# Other Strategies

to improve student success with word problems and number sense

$$h = 3 \text{ units}$$

$$l \times w = 48$$

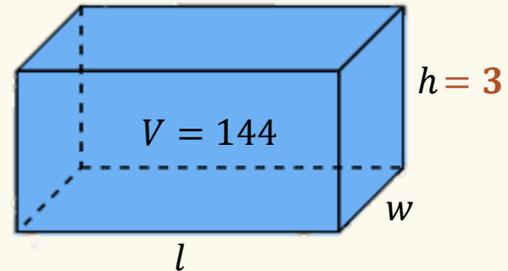
$$1 \times 48 \times 3$$

$$2 \times 24 \times 3$$

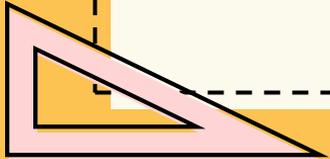
$$3 \times 16 \times 3$$

$$4 \times 12 \times 3$$

$$6 \times 8 \times 3$$



$$B \text{ or } l \times w = 48$$



# Other Strategies

to improve student success with word problems and number sense

$$h = 3 \text{ units}$$

$$l \times w = 48$$

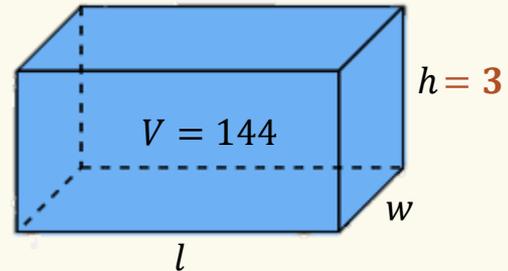
$$1 \times 48 \times 3$$

$$2 \times 24 \times 3$$

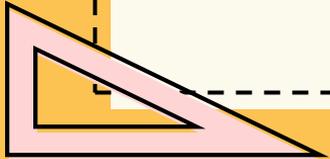
$$3 \times 16 \times 3$$

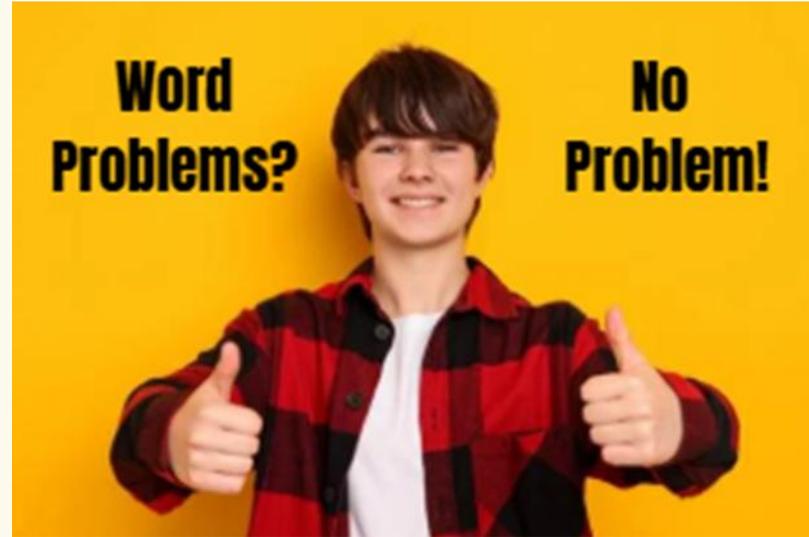
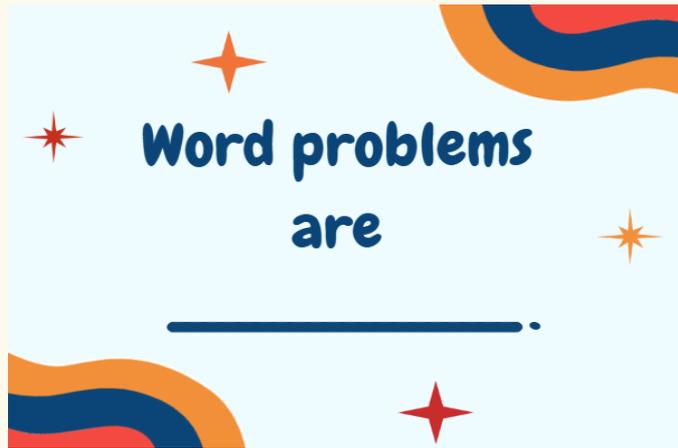
$$4 \times 12 \times 3$$

$$6 \times 8 \times 3$$



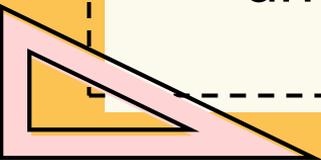
$$B \text{ or } l \times w = 48$$





# Essential Questions

- What are common pitfalls when teaching word problems?
- How do number sense skills help to solve word problems?
- What instructional strategies best teach students to understand and solve word problems?



# Questions

