

Welcome to a Session that Couples Fun Math Activities with Literature Making Meaningful Connections

Math Skills Skyrocket with Challenging and Fun Everyday Activities for Grades 1, 2, and 3

# Math Skills Skyrocket with Challenging and Fun Everyday Activities for First, Second, and Third Graders



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MathAmigos, E-Coaching Embedding Literacy in Math, Community of Practice

Jenifer Hooten, Math Specialist New Mexico Public Education Department (PED)











#### Goals for the Sessions

- I. <u>Share</u> practical, attention getting activities to get students to skyrocket math learning.
- 2. <u>Contextualize</u> and make math learning intellectually vibrant and fun with math-themed literature to promote math thinking, fluency, and meaningful math-centered conversations.

#### Session Focus

- I. Coupling fun math activities with literature makes meaningful connections with everyday living.
- 2. Skyrocketing math learning by using:

Error Pattern Analysis.

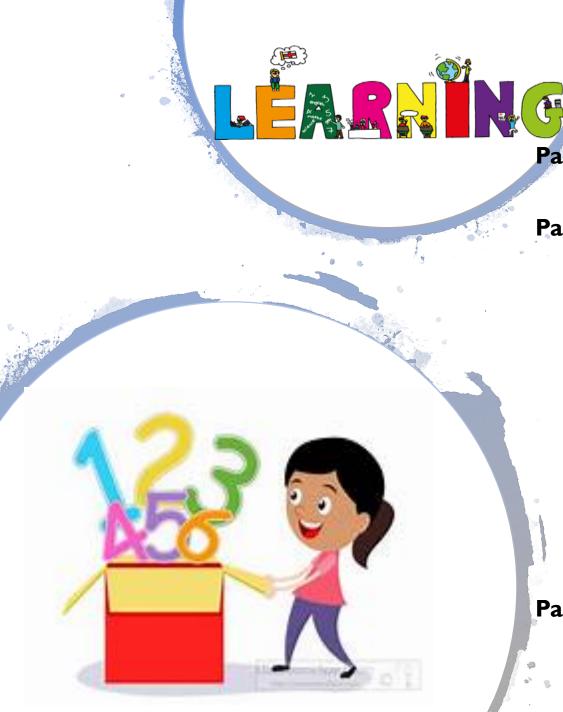
Literature and stories to get the rocket busters operating.

Poems, and Songs.

Movement Math Activities.

Common Core Math Standards—Grades 1, 2, and 3





#### Agenda

Part I: Hosting a "Morning Meeting"

The Task ...

Part II: Instructional Ideas to Consider (stand up if... sit down when named)

A. Six Online Math Fundamentals

- I. Establish a math routine.
- 2. <u>Give</u> actionable & specific feedback (formative assessment).
- 3. <u>Communicate</u> regularly and clearly with students and parents.
- 4. Maintain expectations.
- 5. Scaffold math learning.
- 6. Offer student choice.
- 3. Adding one more ..... \*7

  Analyzing students' math answers (Error Pattern Analysis)

Part III: Focusing on Activities to Accelerate Math Learning

- A. Fun and engaging activities.
- B. Math-themed books, poems, and songs.

## Let's pretend it is our "Morning Meeting" time.

I. You had a "Task" ... Please tell let everyone know what you were asked to do.

You were asked to take a picture of a room where you live or out the window.

#### The question this morning is:

What math is conveyed in your photo?
(What math do you see in the photo/picture?)
(Picture may convey an idea more quickly and effectively than the written word.)



II. Everyone please hold your pictures to your screens.

If you have a birthday in January, please describe the math that is in your photo.

Next have a birthday in March please share. Birthday in September



Name:	Madison	Date:	11/10/XX
_			

For problems 1-3, write the time in the blank provided.







For problems 4-10, draw the hands on the clock for the time indicated below the clock.





seven thirty



quarter past one



half past ten



quarter 'til four



10. Mia and her friends are going to a movie. The movie starts at a quarter past two. Draw the hands on the clock to show what time the movie starts.



Dale: 2/17/xx Name: Elias

For illustrative purposes only 10 of the 25 problems are shown.

Accelerate Math Learning by Pinpointing Error Patterns in Students' Work

How do we know students know?

- Let's look at Madison's work on the left, telling time.
- Now, look at Elias' work on the right.

## Let's Take a Quick Look at Solving Word Problems Applying the Error Pattern Analysis Strategy

I. Common factual, procedural, and conceptual mathematical errors.



#### II. Reading skills ...

<u>Limited math vocabulary</u> (e.g., difference, addend, subtrahend, factor, etc.).

Limited In reading text with vocabulary and complex sentence structure, struggling to understand what is being asked.

<u>Inability to identify relevant information</u> (determining which pieces of information are relevant and which are irrelevant to solve the problem).

Addition

<u>Lack of prior knowledge in experiencing</u> the context in which the problem is embedded.

<u>Inability/challenge to translate the information</u> into a mathematical equation.

#### So, what do you do?

III. Pinpointing errors using five prompts as students solve word problems.

		Hurtles What is the difficulty? What will you do?	
1.	Please read the problem to me. (decoding).	Reading	
2.	Tell me what the question is asking you to do.	Comprehension	
3.	Tell me how you are going to find the answer.	Transformation	
4.	Show me what to do to get the answer.	Processing skills	
5.	Now, write down your answer.	Encoding	

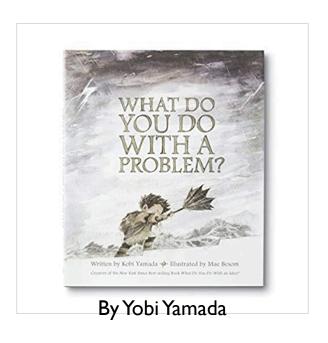
### Continuing with Promoting Problem Solving

#### Activities to Accelerate Math Learning





#### Who listened to this book read?



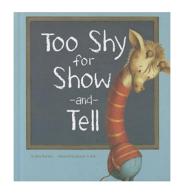
#### What is the message in this book?

https://www.youtube.com/watch?v=UrElYjbllTk or https://www.youtube.com/watch?v=r3-iWtnFq3A.

## How would you use this book with your student as a way introduce problems solving?

- 1. Think of a problem that you have experienced.
- 2. What would the opportunities be associated with that problem?
- 3. Prepare a sheet like the one below to keep track of the problems and opportunities.



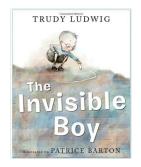


#### Other books that focus on challenges that students might encounter.

<u>Too Shy for Show-and-Tell</u> by Beth Bracken. <a href="https://www.youtube.com/watch?v=ITsa8X0VZ9Y">https://www.youtube.com/watch?v=ITsa8X0VZ9Y</a>



The Book of Mistakes by Corinna Luyken. <a href="https://www.youtube.com/watch?v=LE3I67gBtG0">https://www.youtube.com/watch?v=LE3I67gBtG0</a>



The Invisible Boy by Trudy Ludwig <a href="https://www.youtube.com/watch?v=iTz6Vv6MEkl">https://www.youtube.com/watch?v=iTz6Vv6MEkl</a>



My Very Own Space by Pippa Goodhart. <a href="https://www.youtube.com/watch?v=wKahCLinZHc">https://www.youtube.com/watch?v=wKahCLinZHc</a>

#### #2 Tic-Tac-Toe, a simple yet one of the best games for practicing decision making.

- **A.** Not only do you need to choose squares that will help you get a row of three. It takes a lot of <u>concentration</u> to win at this game.
- B. Draw a simple table like the one below in Jamboard/Padlet/Sketch Pad. Check out <a href="https://playtictactoe.org/">https://playtictactoe.org/</a>.

#### #3 Looking for Patterns

A. Define what a pattern is. <u>Have students look for patterns in their homes</u>. When students are solving a mystery, they look for patterns in <u>time</u>, <u>place</u> or <u>people</u> to gather facts. Take a look at a short video, What are Patterns? <a href="https://drive.google.com/drive/folders/122sqmrrjeJfDBctRC7P6TpA9jWXuFuLP">https://drive.google.com/drive/folders/122sqmrrjeJfDBctRC7P6TpA9jWXuFuLP</a>



<u>Check out</u>, *The Missing Mittens* by Stuart Murphy at <a href="https://www.youtube.com/watch?v=vuGj6-qlo5c">https://www.youtube.com/watch?v=vuGj6-qlo5c</a>

<u>Start with taps and claps</u>. Begin rotating between tapping on a counter/table and clapping your hands: tap, clap, tap, clap, etc. For more pattern ideas, <a href="http://albany.k12.or.us/media/2016/04/snap\_cap\_patterns.pdf">http://albany.k12.or.us/media/2016/04/snap\_cap\_patterns.pdf</a>
Another sequence, flap arms, clap hands, snap fingers ... Good way to keep your students moving. Ask students develop patterns using different sounds.



As students to describe the sequence of movements and sound (Math Talks). You are looking for the word "pattern" in their explanations. Continue this process of making patterns that are increasingly more difficult to decipher.

**B.** Then use <u>figures</u> like the following:



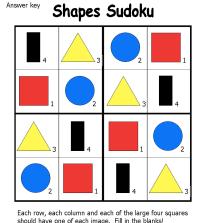
Ask the following questions about the example above:

- I. Does anyone see a pattern?
- 2. What pattern do you see? What comes next?
- 3. Is there more than one possible pattern?
- C. Looking for weather patterns with a paper plate Caterpillars.

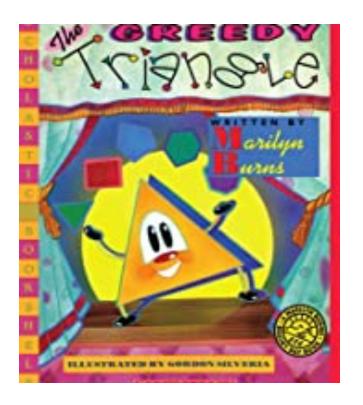


**44** Shapes Sudoku. Have the students solve the shapes Sudoku problem below. Have the students create their own Sudoku problems to share with the class.

Each row, each column and each of the large four squares should have one of each image. Fill in the blanks!



**#5** 



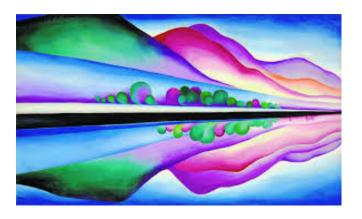
#### Extending The Greedy Triangle book.

https://www.youtube.com/watch?v=kPuI4XyyZUE

- I. Let's play "I Spy Shapes" Game <a href="https://www.youtube.com/watch?v=-Hh2">https://www.youtube.com/watch?v=-Hh2</a> x7jujl
- 2. Georgia O'Keeffe for Kids, continue with the "I Spy Shapes Game."



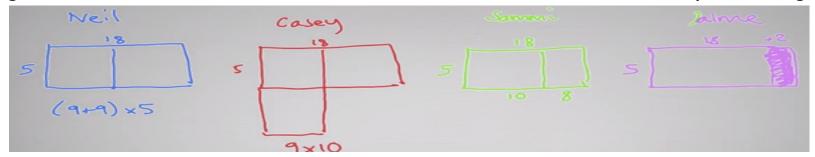






#### #6 Number Talks (or "Math Talks")

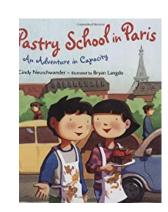
- A. The focus is on identifying all the possible strategies to find the answer to a problem. Students explain their strategies/methods, while others learn from these explanations of how they solve the problem.
- **B.** Get started by giving students a SHORT math problem to solve without a calculator or paper & pencil. The goal is to have them solve it in their heads! Ex. below shows 4 different ways of finding  $5 \times 18$ .



- Besides talking, teachers and students <u>exchange</u> math ideas. Exchange is key so that students <u>share their ideas, communicate their understandings, and ask questions.</u>
- **D.** Math Talks provide opportunities to understand and analyze students' thinking (formative assessment) by posing meaningful questions and developing grade-level-specific grade level problems. *Number Talks* support the Common Core State Standards for Mathematics.
- **E.** <u>Use Hand Signals</u> during Number Talks. [Phonemic Awareness]

#### **#7** Everyday Real Life Math Learning at Home

A. Math in the Kitchen (Cooking with Kids, popular program at school)



B. Math on the Road



C. Math at the Grocery Store. [Now with masks!]



D. Math Through Whining (Learning about time, estimation .... how long will it take you to clean your room?)



#### #8 Math with Mr. R's ...

- A. Use choral responses <a href="https://www.youtube.com/watch?v=uDSWMjtMff4">https://www.youtube.com/watch?v=uDSWMjtMff4</a> (counting by 5s)
- **B.** Donut Subtraction <a href="https://mathstory.com/youtube-math-videos/subtraction-song-missing-donuts-mystery/">https://mathstory.com/youtube-math-videos/subtraction-song-missing-donuts-mystery/</a>
- C. Math Songs, Poems <a href="https://mathstory.com">https://mathstory.com</a>
- Music Videos <a href="https://mathstory.com/youtube-math-videos/">https://mathstory.com/youtube-math-videos/</a>
  https://mathstory.com/youtube-math-videos/7-x-8-song/



#### E. Plus, Other Songs

https://video.search.yahoo.com/yhs/search?fr=yhs-pty\_forms&hsimp=yhs-pty\_forms&hspart=pty&p=distributive+property+songs#id=2&vid=c9ba9751449abd5e39404c8e9f15cdde&action=click

https://video.search.yahoo.com/yhs/search?fr=yhs-pty\_forms&hsimp=yhs-pty\_forms&hspart=pty&p=distributive+property+songs#id=1&vid=8284375d3280da7718f51c0f5d43c66a&action=view

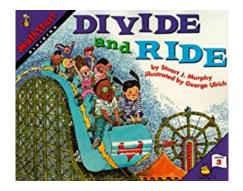


**f9** Connecting Math and Literacy by ...

#### Writing a Number Poem

Ву			
Number	looks like		
and sounds like			
Number	smells like		
and tastes like			
Number	_ feels like		
and I like numbe	r	_ because	

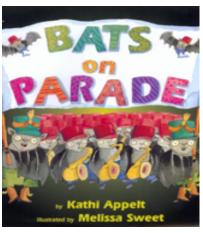
Writing an Addition,
Subtraction Story ...



## Who listened to ....?

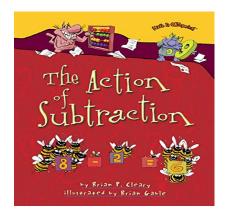


https://www.youtube.com/watch?v=LNZUErh3rUM



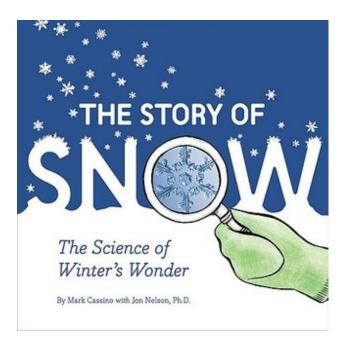
By Kathi Appelt

https://www.youtube.com/watch?v=CUnTVIX5yc4



By Brian Cleary

https://www.youtube.com/watch?v=sSW2Vmq7epI



#### Mark Cassino

https://www.youtube.com/watch?v=ZtXU0WKmuBE



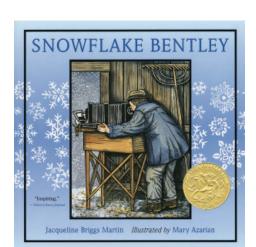


Alicia Ayala, El Camino Real Academy, teaches third grade and loves these two books. Here is how she uses them with her students.

#### Snowflake Bentley

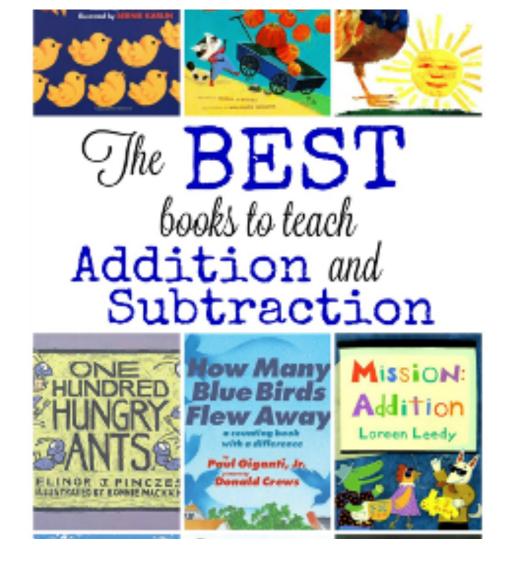
#### https://www.youtube.com/watch?v=rtyLpo3cWic

Bentley's photographs revealed that no two snowflakes are exactly alike and provides an context for <u>problem solving</u> involving multiples of three and six.



#### Counting on Literacy to Scaffold Math Learning...

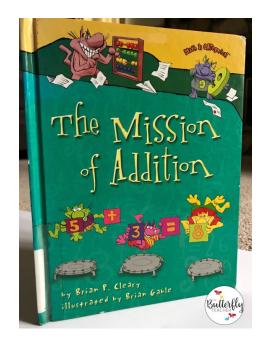
https://www.sftumbleweeds.com/articles/counting-on-literature



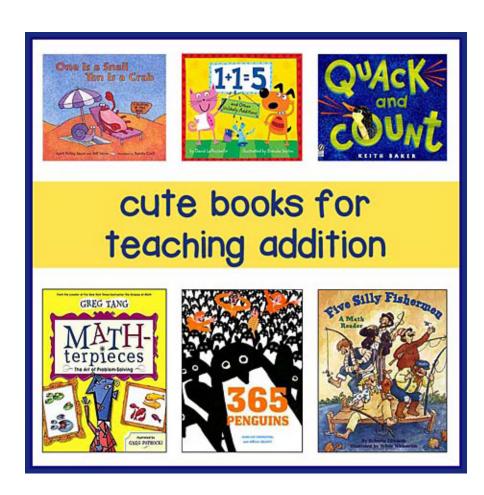
Fiction and nonfiction literature and informational materials contextualize math concepts and offer opportunities to make sense of problems, construct viable arguments, and model by thinking, talking, and writing math.

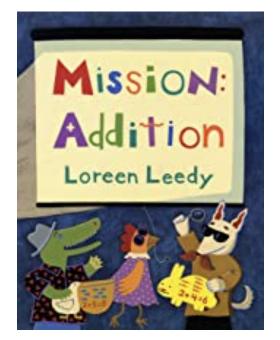
Math-themed literature engages students in active learning by getting them to persevere while using concrete-representational-abstract learning sequences. Math and literacy in concert support and strengthen students' math reasoning and problem-solving skills and contribute to meaningful and targeted math talks and higher order thinking.

For practice, have students read math-themed books to a pet, stuffed animal, or friend.

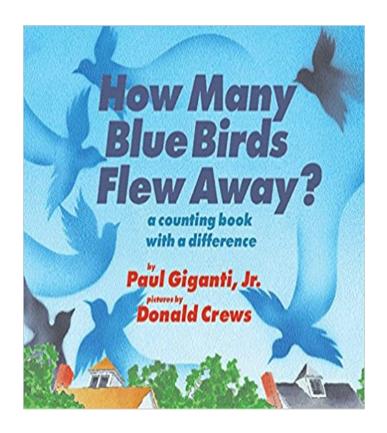


https://video.search.yahoo.com/yhs/search?fr=yhs-pty-pty\_forms&hsimp=yhs-pty\_forms&hspart=pty&p=mission+addition+book+read+on+you+tube#id=1&vid=c15a8d812b7cd515a4004fb44d5cf85b&action=click



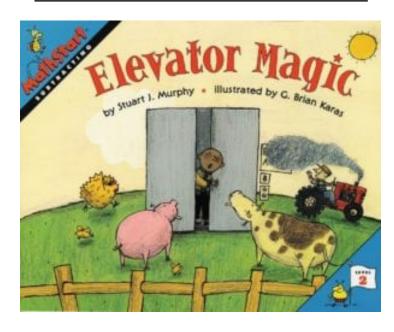


https://video.search.yahoo.com/yhs/search?fr=yhs-pty-pty\_forms&hsimp=yhs-pty\_forms&hspart=pty&p=kids+books+on+addition+read+on+you+tube#id=1&vid=c15a8d812b7cd515a4004fb44d5cf85b&action=click

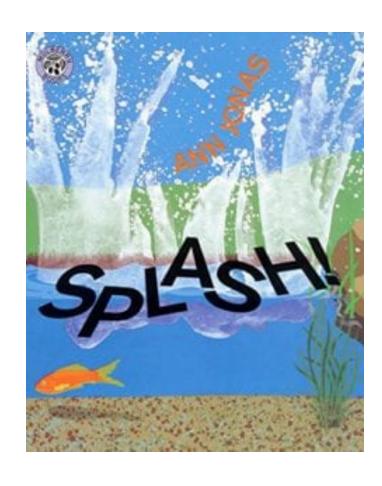


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Books
Subtraction and Counting

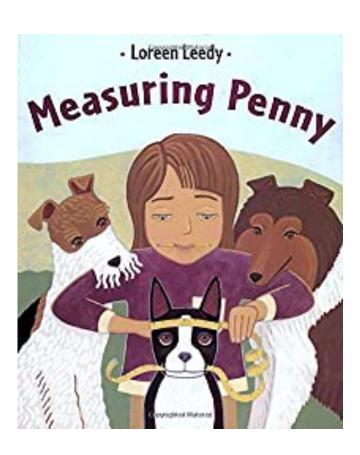


https://www.youtube.com/watch?v=A vxSUi1Zv4I

Measuring Penny by Loreen Leedy is a fun story about a young girl who has a homework assignment to measure something in several ways.

<a href="https://www.youtube.com/watch?v=-kHIQh6bgq0">https://www.youtube.com/watch?v=-kHIQh6bgq0</a>







## On Reflection ...

- ♦ Q&A, Comments ....
- ◆One take away from the session?
- ◆What did you discover or learn?
- ◆What surprised you?



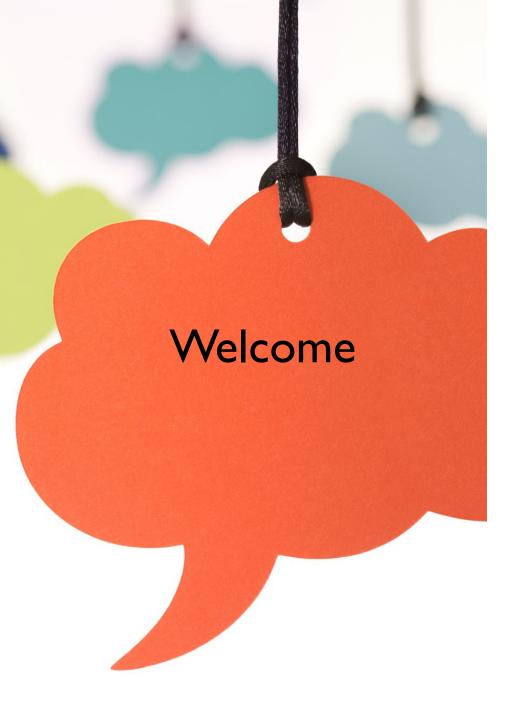


## Thank you!



Keep in Touch!
Contact:
jreinhartz@utep.edu





While waiting for our session to start, please remember to:

USE only your FIRST NAME in your image. (right click in your image box, then click "Rename").

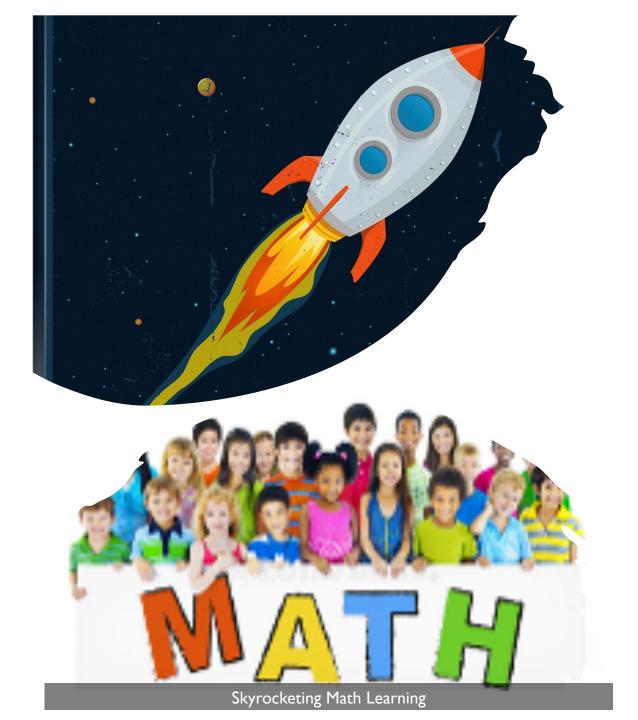
✓ Make sure your VIDEO is on (bottom of your screen).

✓ Make sure your AUDIO (Mic) is on (unless you have excessive background noise).

✓ If you have questions, please use the CHAT box at the bottom center of your screen.

Many Thanks!

Dr. Judy and Jenifer



## Act 11

## Teachers Sharing

Engaging Activities to Propel Math Learning

Judy Reinhartz©, Professor Emeritus The University of Texas at El Paso, <u>ireinhartz@utep.edu</u>

MathAmigos, E-Coaching Embedding Literacy in Math, Community of Practice

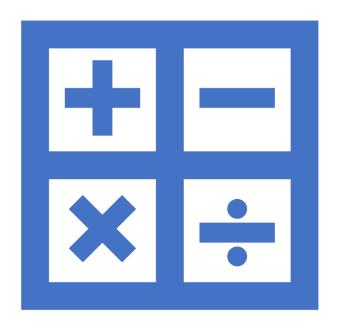
Jenifer Hooten, Math Specialist New Mexico Public Education Department (PED) Jennifer Benzo Sotodosos and Ericka Encinias

Teaching Math Virtually in Grade 3

Sweeney Elementary School, SFPS

MathAmigos E-Coaching Program

# Creating Word Problems



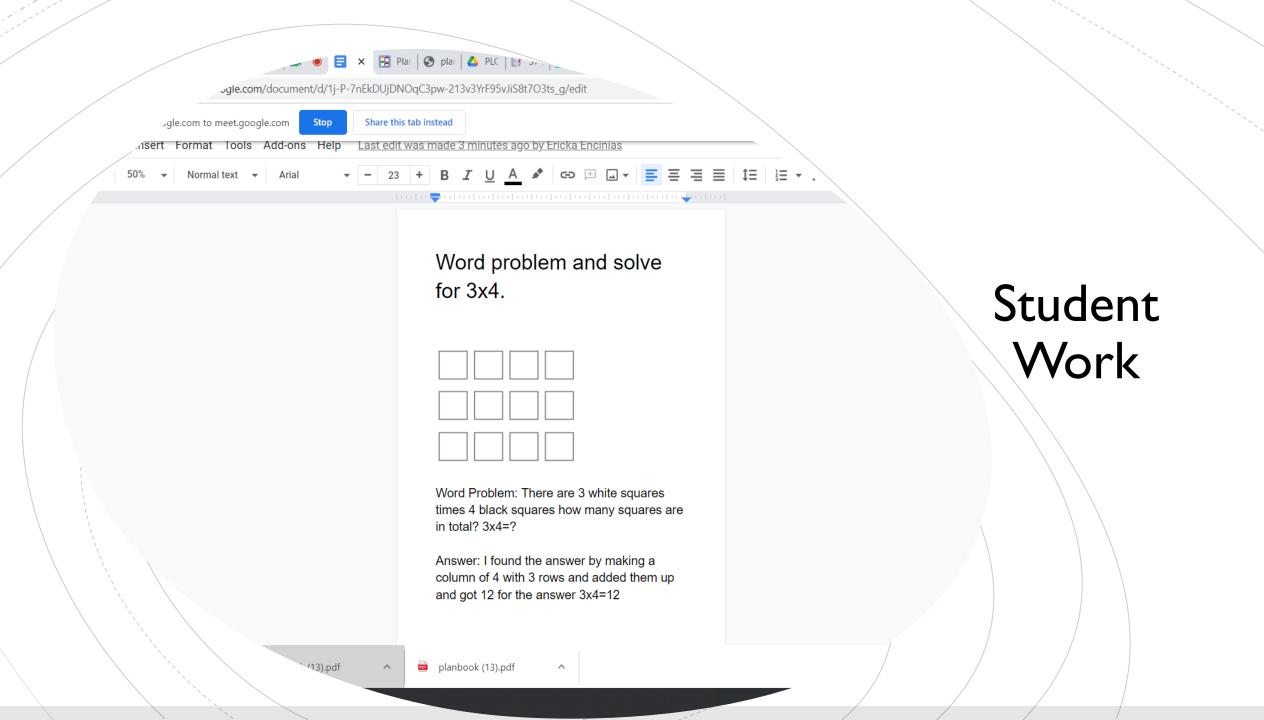
Giving equations for multiplication.

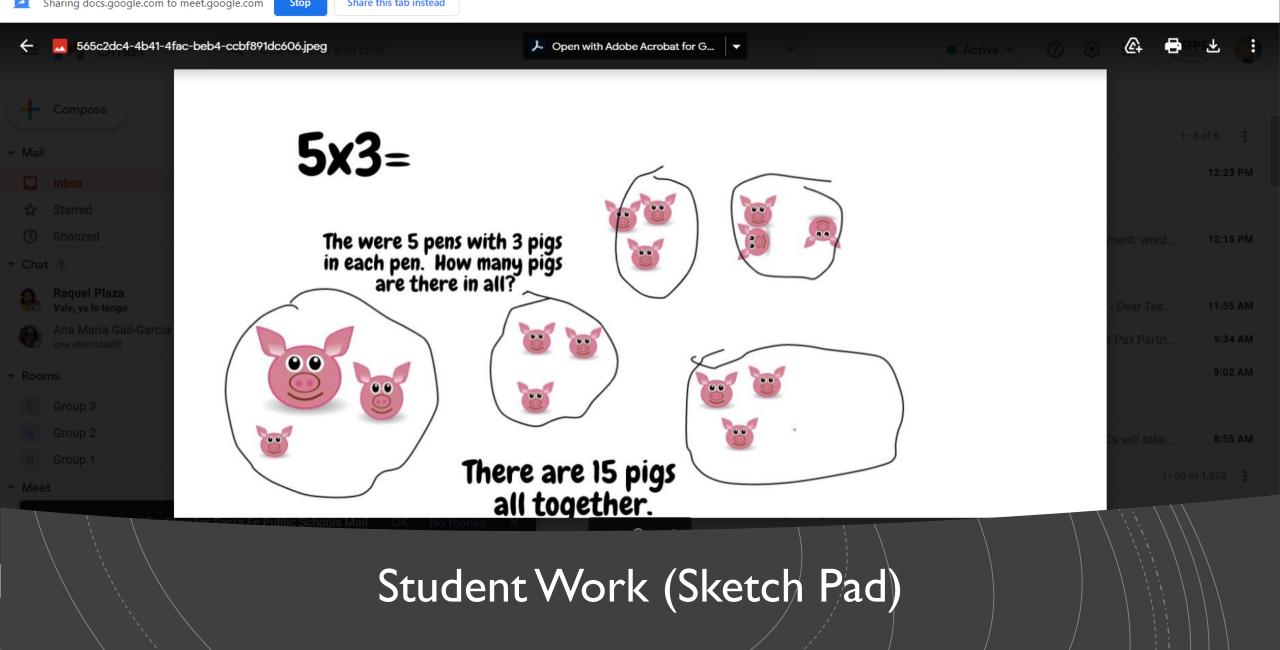
Students write the story for the problem.

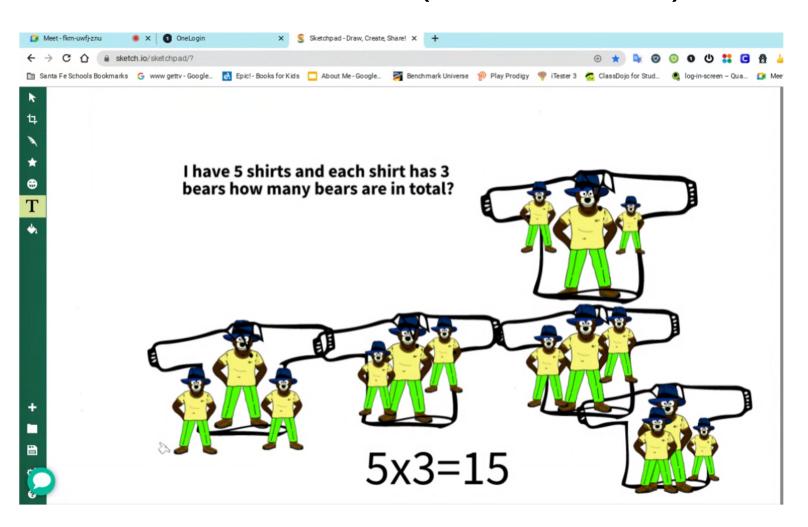
Model the equation.

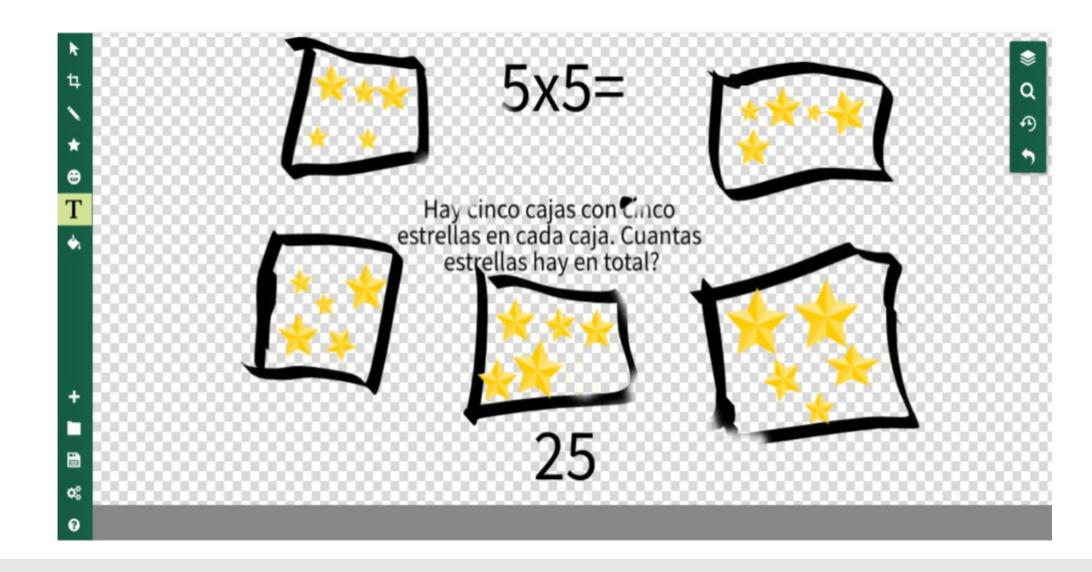
Solve the equation.

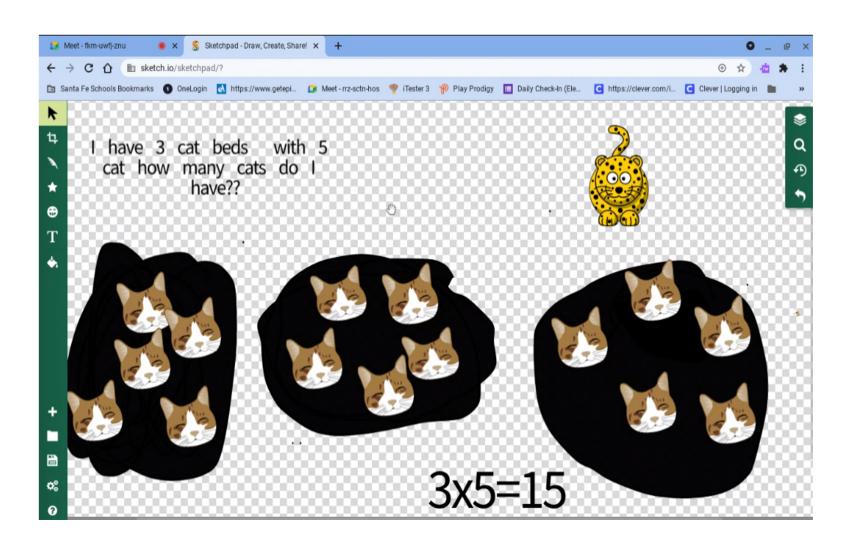
Explain their answer in words.

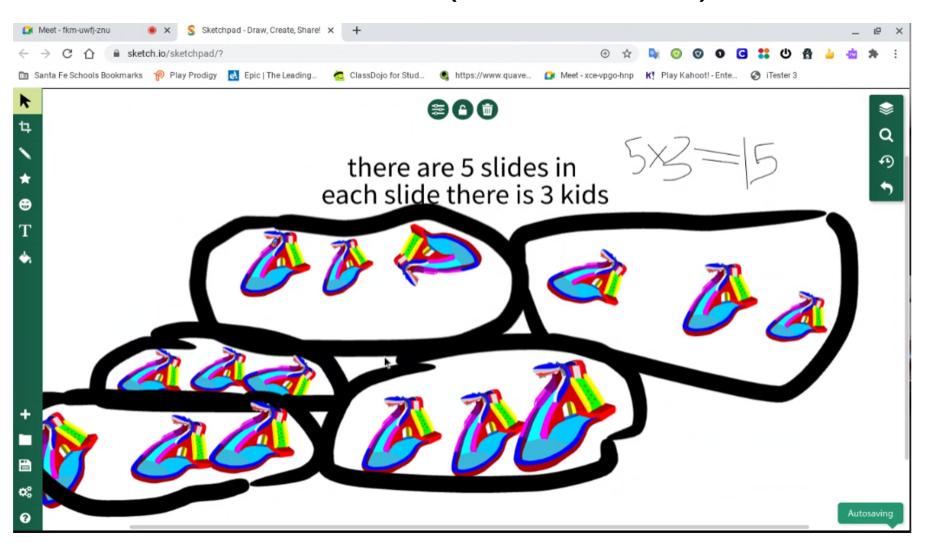


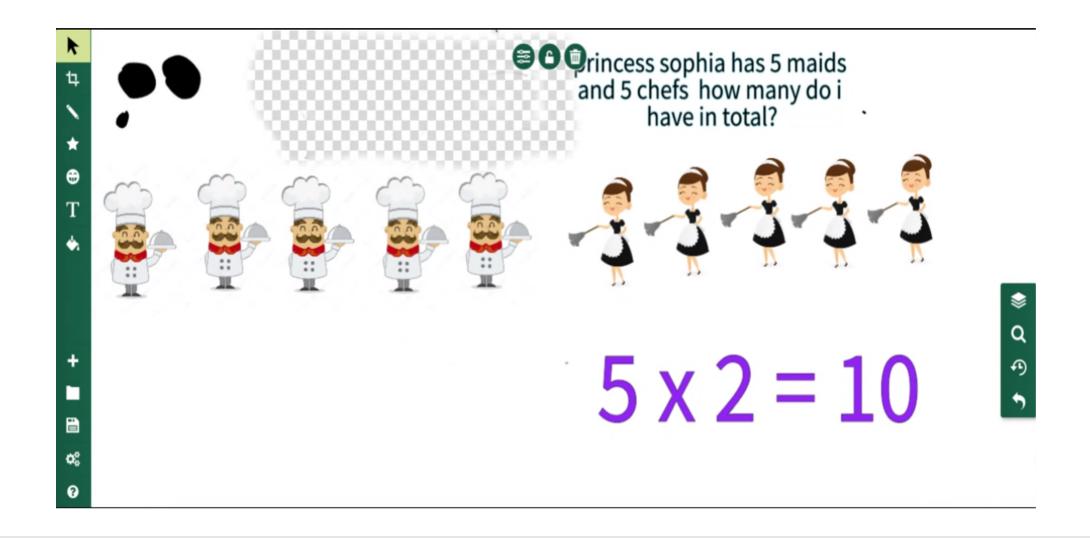






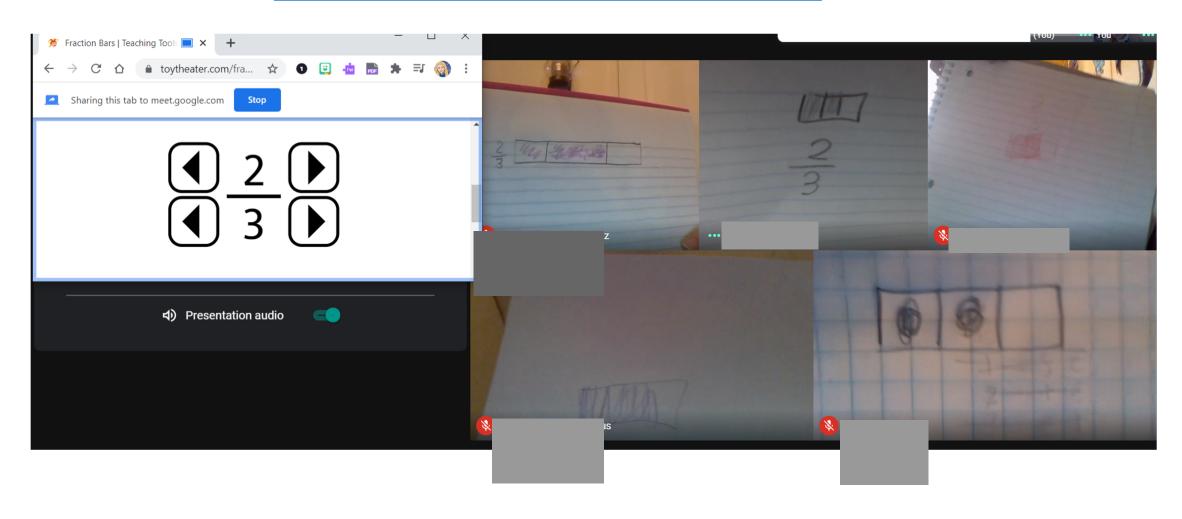




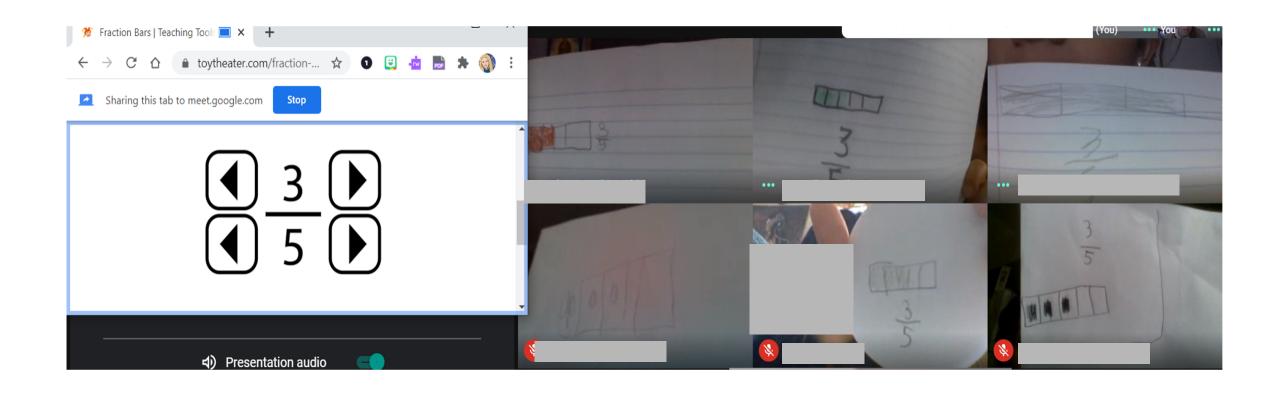


## Student Work (Math Manipulatives)

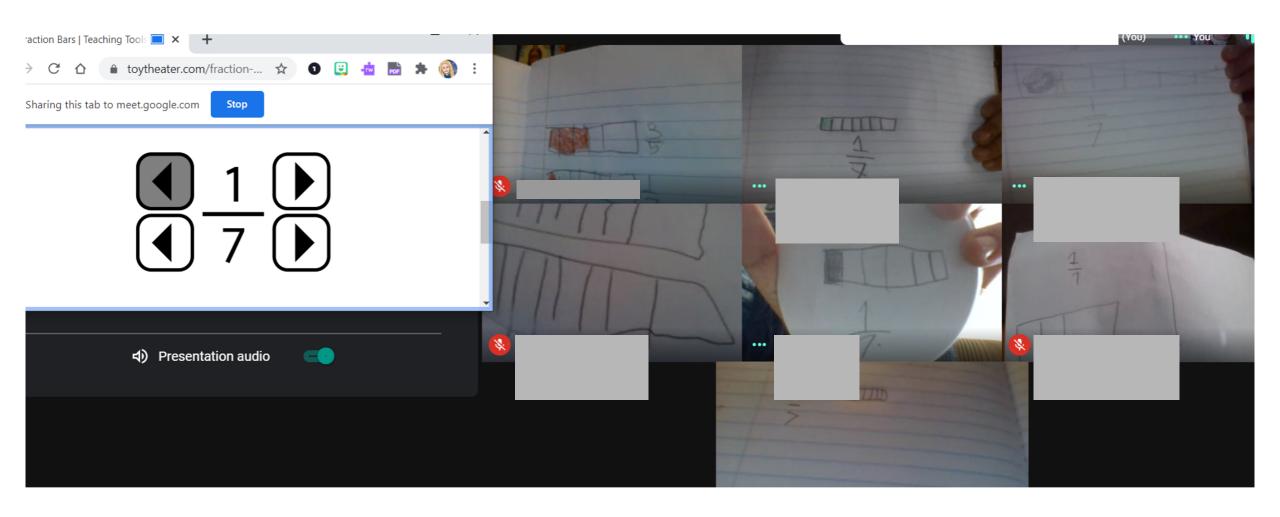
https://docs.google.com/presentation/d/1jadlg9nk64U9gWtj4QEbd-AEzVtCXQeH-y44LPXIF3M/present?slide=id.g27b693dca5\_0\_261



## Student Work (Virtual Math Manipulatives)



## Student Work

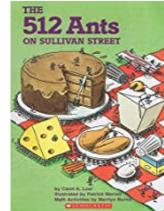


### Links for Virtual Tools

INTERACTIVE BOARD: <a href="https://sketch.io/sketchpad/">https://sketch.io/sketchpad/</a>

VIRTUAL MATH MANIPULATIVES: <a href="https://docs.google.com/presentation/d/ljadlg9nk64U9gWtj4QEbd-AEzVtCXQeH-y44LPXIF3M/present?slide=id.g27b693dca5">https://docs.google.com/presentation/d/ljadlg9nk64U9gWtj4QEbd-AEzVtCXQeH-y44LPXIF3M/present?slide=id.g27b693dca5</a> 0 261





READ ALOUD BOOK, The 512 Ants on Sullivan Street by Carol A. Losi

https://video.search.yahoo.com/yhs/search?fr=yhs-pty\_forms&hsimp=yhs-pty\_forms&hspart=pty&p=512+ants+read+on+youtube#id=2&vid=df4380ab7c3babd87e760d3b8329a8ad&action=view

This tale teaches the concept of doubling and can be used as an introduction to multiplication. A family goes on a picnic and attracts ants, listen to the story to see what happens.

Teaching with

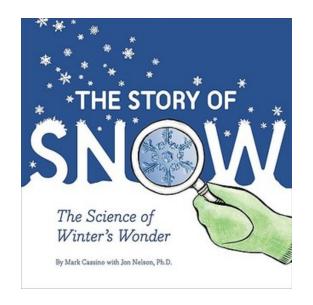
Math-Themed Books in the Third Grade

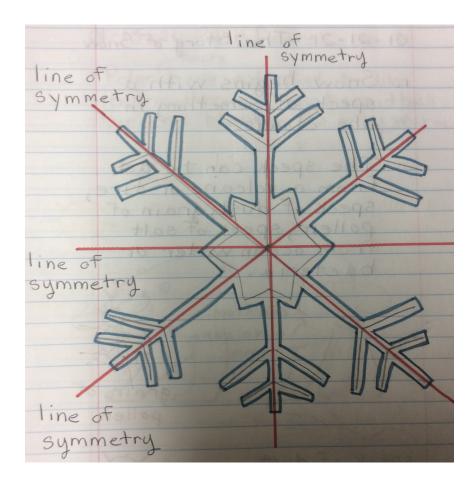
Alicia Ayala

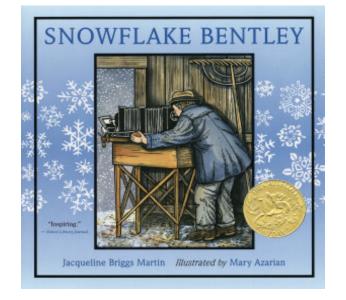
Act 11 ...

Here Comes the Teacher from El Camino Real Academy, SFPS

MathAmigos E-Coaching Program



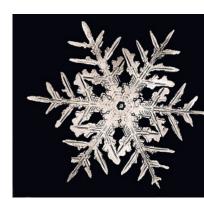


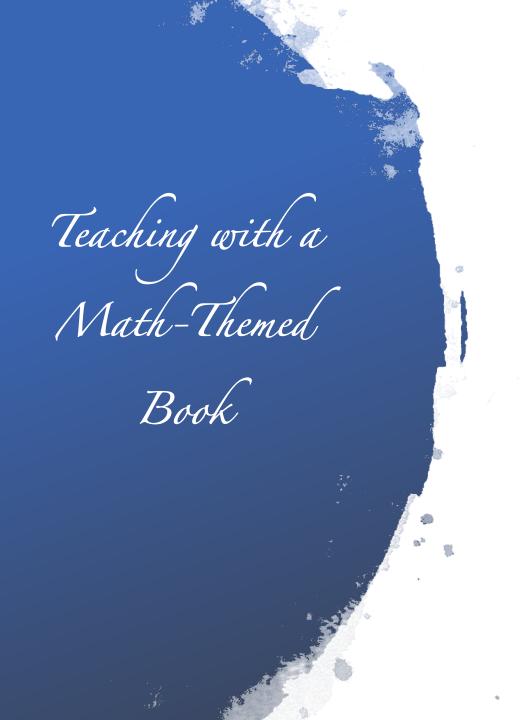




Sharing how she uses these books

with her students.





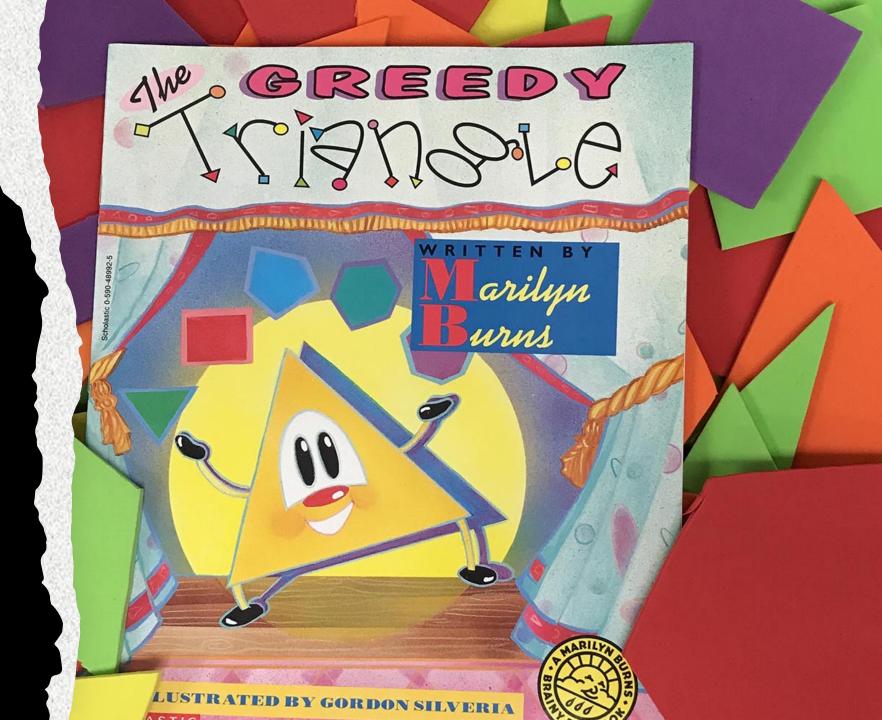
Here Comes ... Anne Brito

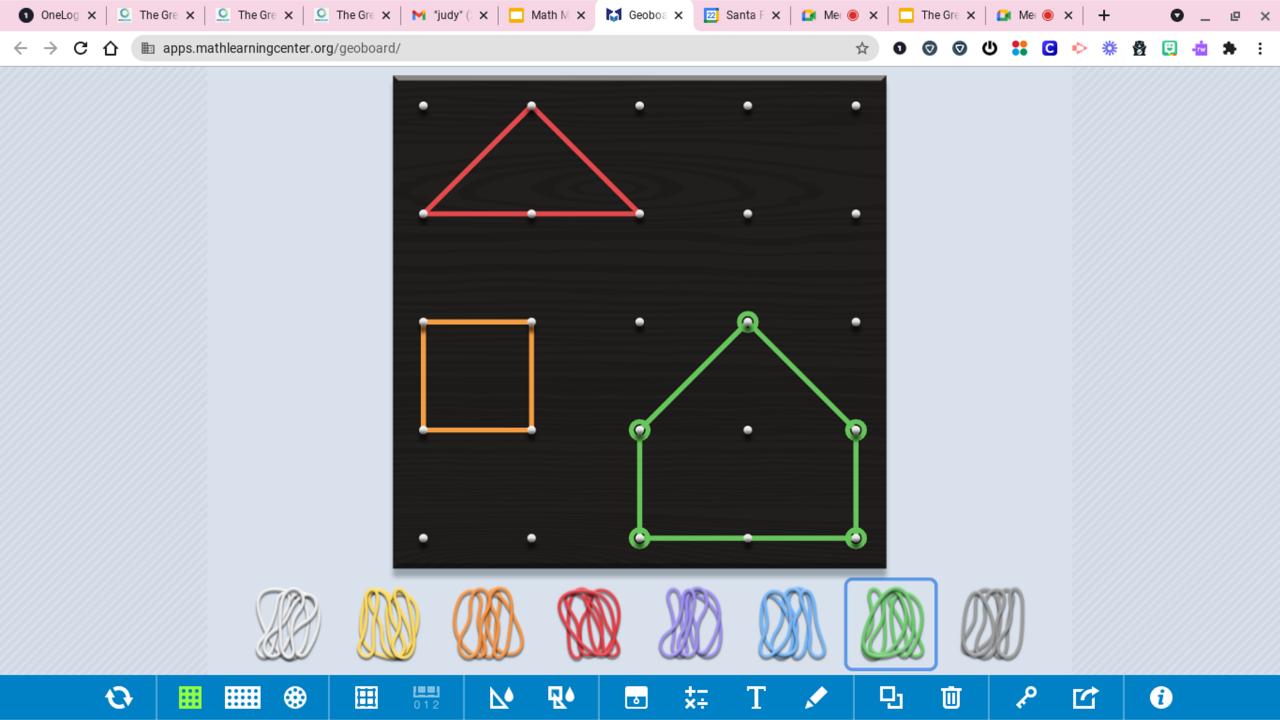
Fourth Grade Team Leader Sweeney Elementary School, SFPS

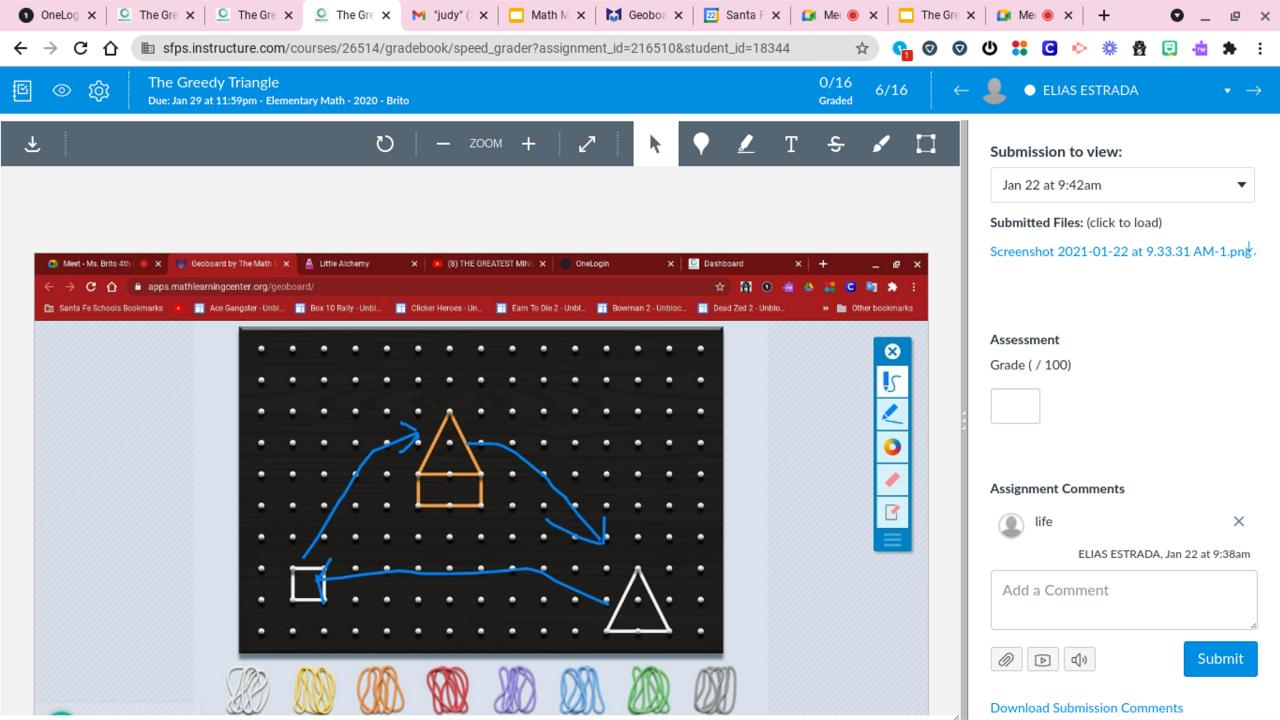
MathAmigos E-Coaching Program

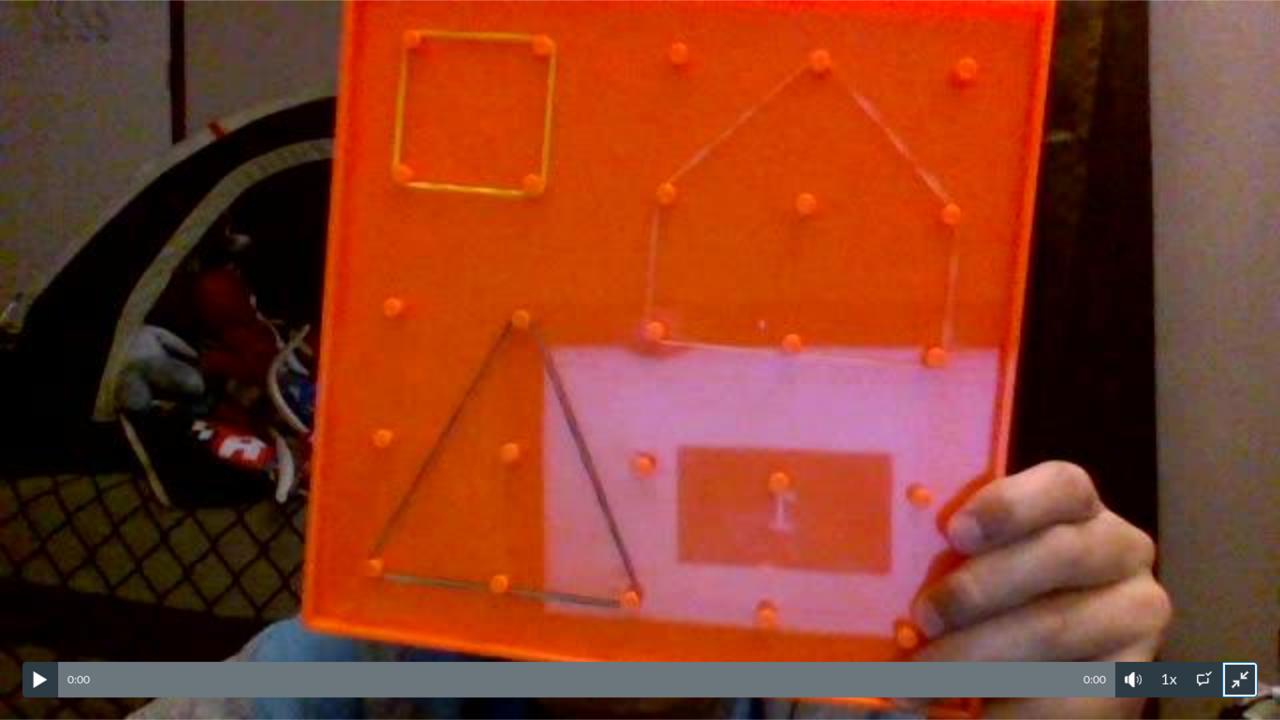
#### **Activities**

- A. Students were divided into two groups.
- geoboards and virtual geoboards to create the polygons from the story.
- C. Group 2 used the writing prompt:
  Which polygon do you want to be and why?



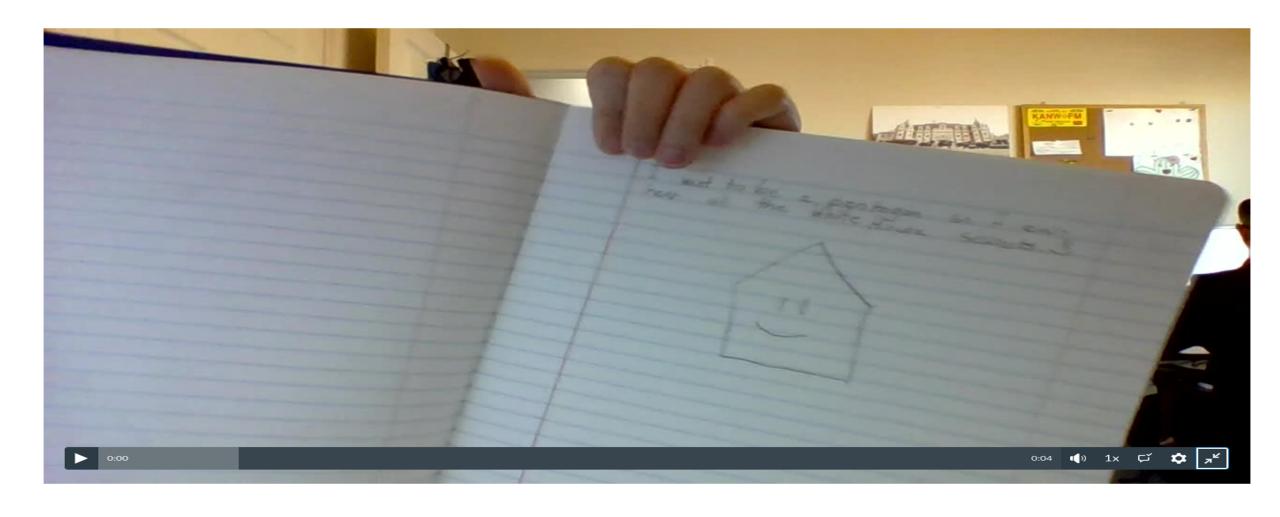




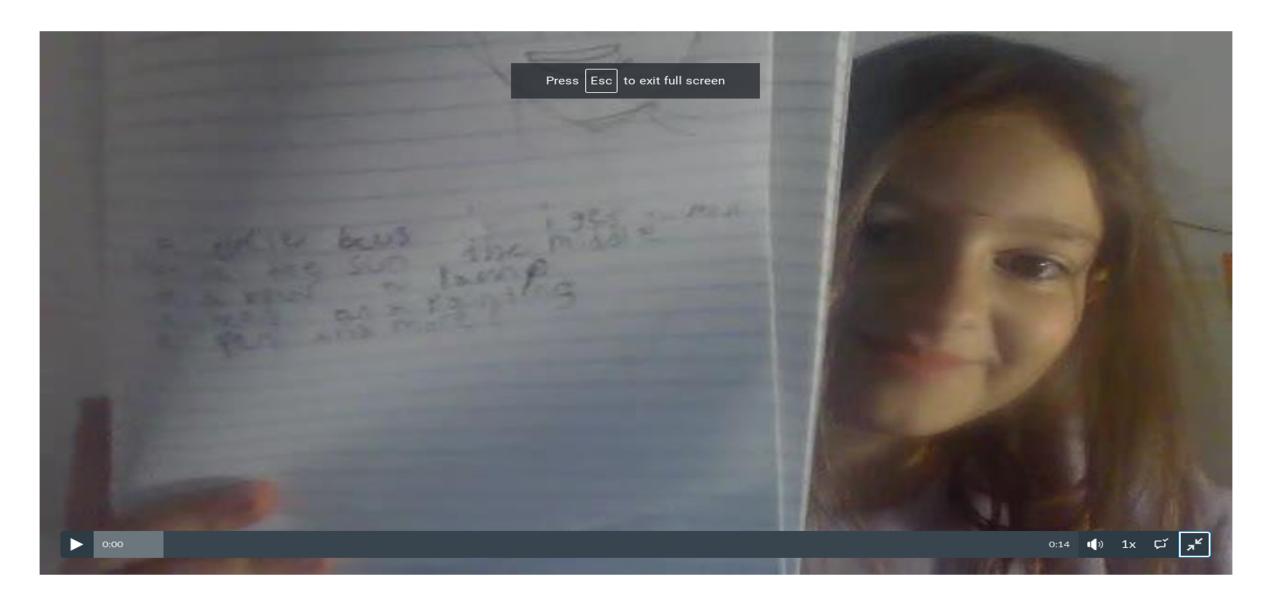




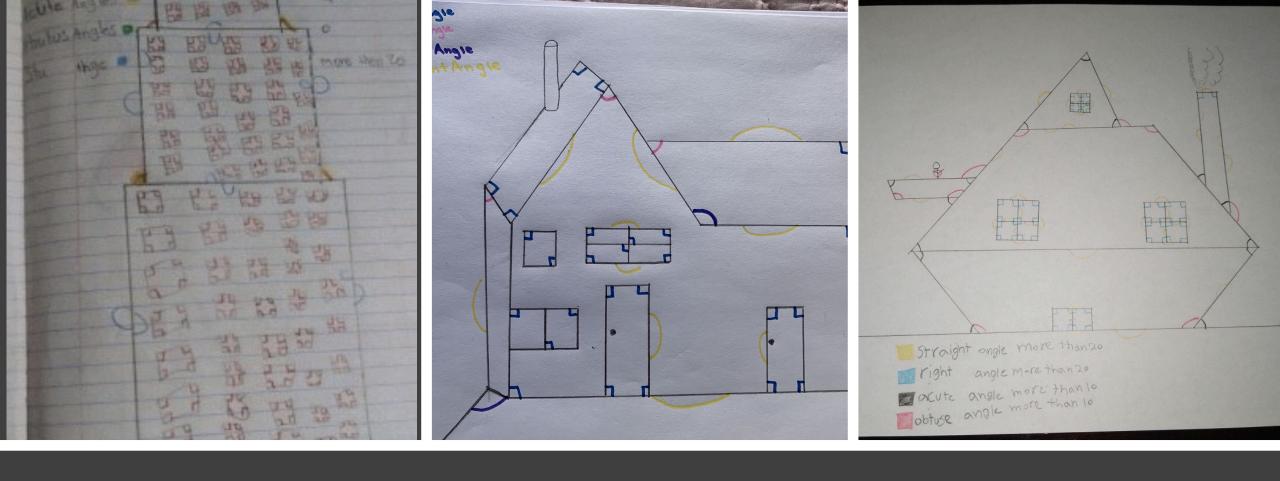
I would want to be a circle because I would be able to roll down the tallest hills and be thrown by someone and it would be fun because you could travel as far as you like because you could become a tire.



I want to be a pentagon so I can hear all the While House top secrets..



I want to be a circle because I want to roll around and down stairs and because I get to be the middle of a bow tied in someone's hair.



More Samples from Fourth Graders
Creating buildings using polygons and applying different types of angles.

## Time for...

- Q&A and Comments
- Do you have ideas to share?
- ◆ What did you discover or learn?
- ♦ What surprised you?



# Thank you!



Keep in Touch!
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