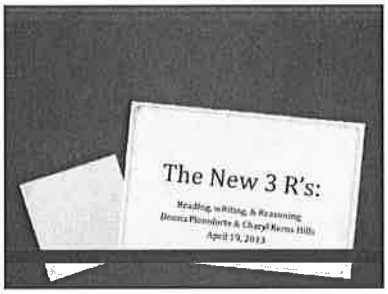



## Session Goals

- Participate in standards-based activities which focus on reasoning
- Connect the activities to the Common Core Standards
- Leave with ideas & resources (websites, etc.) to use in your teaching
- Have fun while thinking & reasoning

Reading, writing, and mathematics must be about thinking and constructing meaning.


A reader needs to interact with the text.

A mathematician needs to interact with numbers and concepts.

## Why?

Providing mathematical activities that are "rich in language, where thinking is encouraged, uniqueness is valued, and exploration is supported" (NCTM 2000, p. 74) better prepares children for advanced mathematics concepts regardless of their background.

Technology is not always the best tool

## Why?

3 skill sets for modern economy

- Numeracy – being able to reason mathematically & deal with statistics
- Design thinking – make design decisions in professional life
- Ability to sell – pitch ideas, ask for resources, persuade others to work differently)


From Daniel Pink "To Sell Is Human"

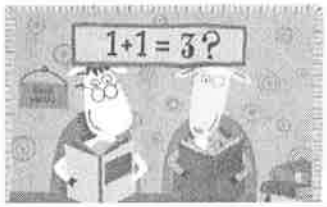
## 1 + 1 = 5? Can it be?

Use pictures, words, numbers, and / or symbols.
If no, give reasons why not.
If yes, give reasons why.

Yes, 1 + 1 = 3.


David LaRochelle

1 + 1 = 3 ?





Try 1 + 1 = 5 again.
Rethink!

Squirming is OK

Perseverance

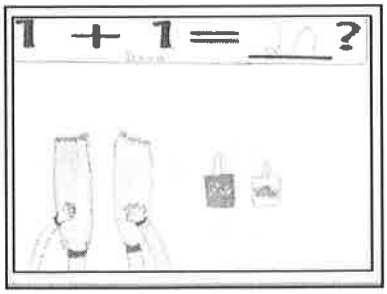
Math Matters

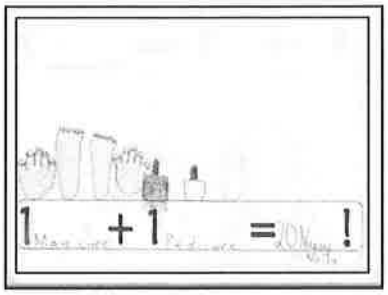
Reflect: Did *you* do what mathematicians do?

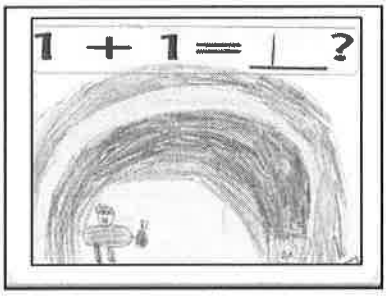
| | |
|---|---|
| ☐ | Thought and planned |
| ☐ | Used math tools |
| ☐ | Used proof |
| ☐ | Listened to others |
| ☐ | Worked hard |
| ☐ | Tried another way |
| ☐ | Checked my work |
| ☐ | Challenged myself |
| ☐ | Used numbers and words to make sense |
| ☐ | Explained my thinking |
| ☐ | Changed my thinking |

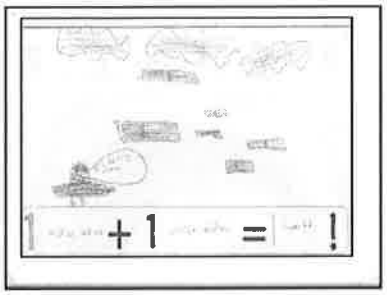
Mathematical Practice 1

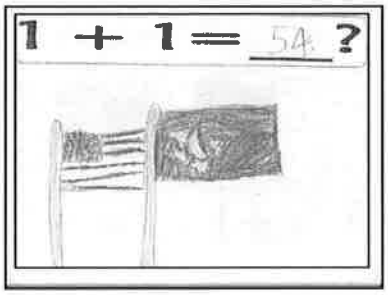

More Riddles

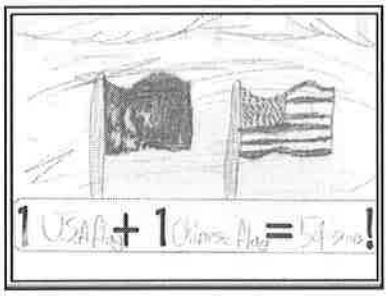





Name as many.....

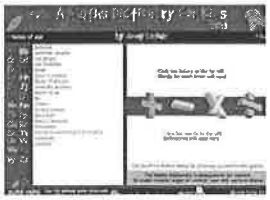
Math words that begin with _____?

**Or try:**

**How many words can you come up with that relate to math?**
**Can you think of 26 different words that start with a different letter? You can use a dictionary if you like.**

Think time is healthy

B is for .....



G is for Googol

A Math Alphabet Book


Gougol ≠ Google

## Diary of a Worm, Spider, or


Doreen Cronin

## How about a Math Diary of a Fly?

- Flies have 4,000 separate lenses in each eye- 8,000 in all! But they have poor vision.
- The average house fly lives on average 21 days.
- Flies don't grow they are born full size.
- There are more than 16,000 species of flies found in North America.

## Try this!

Meet a black fly.

It is 1/8 of an inch long. You would need to line up _____ of them to equal ½ of an inch. ___ = ½ and so does _____.

Flies can fly at an average speed of 4.5 mph (miles per hour). Can you write this as a whole number and fraction in simplest form?

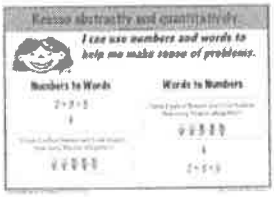
Did you know flies beat their wings 200 times per second?

At this rate if a fly beat their wings 2,400 times, how long would it take the fly?

My pet fly has a _____ square with 0. The fly will feel better with more space to stretch its wings.
Design an area below that is 8 square units. How many different spaces can you create that are this size?

## Break free of the teacher's manual

## Mathematical Practice 2




## Another View to Reason With

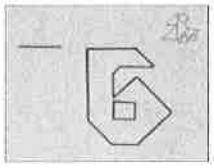
S. Werner & S. Forss

## Insects by the Numbers

A flea can jump 8 inches, which is 150 times its own height.

A cockroach can survive for 168 hours without its head.

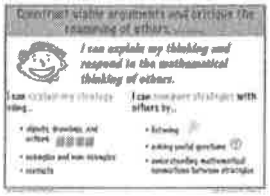
## Name six ways to use.....



## Inspiration from...

Harriet Ziefert

## Mathematical Practice 3




## Providing mathematical activities that are

"rich in language, where thinking is encouraged, uniqueness is valued, and exploration is supported" (NCTM 2000 P. 74) better prepares children for advanced mathematics concepts regardless of their background.

## Connections

What subjects/processes have we used in the activity?


## Connections

### Mathematical Practice

Make sense of problems and persevere in solving them. (Mathematical Practice 1)

Reason abstractly and quantitatively. (Mathematical Practice 2)

Construct viable arguments and critiques the reasoning of others. (Mathematical Practice 3)

Model with mathematics. (Mathematical Practice 4)

## Invention comes from discomfort

## The biggest payoff often comes from the most difficult tasks

## Connections

### Mathematical Content

- The meaning of 1
- Parts of a whole
- Write and interpret numerical expressions. (Common Core Standards, Mathematics Grade 5, Operations & Algebraic Thinking)
- Part whole relationships
- Convert decimal to fraction in simplest form
- Division
- Measurement: area

## Connections
## Literacy- Speaking & Listening

Engage effectively in a range of collaborative discussions (one-on-one, in groups, & teacher-led) with diverse partners on grade _ topics and texts, building on others' ideas & expressing their own clearly. (CCS ELA-Literacy, Speaking & Listening)

- Determine the main ideas & supporting details of a text read aloud or information presented in diverse media & formats, including visually, quantitatively, & orally.

- Explain their own ideas & understanding in light of the discussion.

## Connections
## Literacy

Pose & respond to specific questions to clarify or follow up on information, and make comments that contribute to the discussion & link to the remarks of others. (CCS ELA-Literacy, Speaking & Listening)

ENGAGE *Literacy*

## Connections
## Literacy

Report on a topic or text, tell a story, or recount an experience with appropriate facts & relevant, descriptive details, speaking clearly at an understandable pace. (CCS ELA-Literacy, Speaking & Listening)

Speak in complete sentences when appropriate to task & situation in order to provide requested detail or clarification. (CCS ELA-Literacy, Speaking & Listening)

## Connections
## Literacy

Refer to details & examples in a text when explaining what the text says explicitly & when drawing inferences from the text. (CCS ELA-Literacy, Reading: Literature)

Determine the meaning of words & phrases as they are used in a text. (CCS ELA-Literacy, Reading: Literature)

## Other Ways to Promote Reasoning

Recipes

Poetry

Comics

Concept Mapping

Trivia

How To

Lyrics

## Math Moments Website

www.crsd.org/mathmoments

Go to Resources to find workshop materials.


Be4 you leave –
thanks!
You cre8ed a gr8,
s2pendous, and 1derful
time 4 us!

Thanks!

## Create more Wumbers!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