

# Family Tree Puzzle

- ☞ Can you figure out the family tree? There are two grandparents who had two children, who both got married, and one family had 2 children and one family had 3 children. Totaling 11 people in all: Anna, Dan, Danny, Glenn, Hannah, Jean, Molly, Patty, Robyn, Tara, and Will.
- ☞ One of Robyn's ancestors is Dan.
- ☞ Danny's sister gave birth to Anna.
- ☞ Will has two sisters, one of whom is a math teacher.
- ☞ Hannah married Danny.
- ☞ Glenn is not an ancestor, nor cousin of Molly
- ☞ Danny was named after his father.
- ☞ Will's grandmother's daughter is Patty.
- ☞ Tara's only sibling showed Hannah's daughters her favorite math game.
- ☞ Jean has three granddaughters that are math teachers.

# Classroom Discussions: Developing Math Talk

Molly Rawding, Ph.D.  
Tara McKenzie, M. Ed.



*Start with the logic puzzle in your packet...*

*And you may find out how Molly and Tara know each other...*



# Goals

- ∞ Understand why math discourse is important for deepening student learning so students have the opportunity to make sense of their thinking and the mathematics.
- ∞ Learn about strategies that support implementation of math talk moves.
- ∞ Develop a plan to implement various forms of meaningful classroom talk.

# Why is math talk important?

- ⌘ Talk can reveal understanding and misunderstanding.
- ⌘ Talk supports robust learning by boosting memory.
- ⌘ Talk supports deeper reasoning.
- ⌘ Talk supports language development.
- ⌘ Talk supports development of social skills.

# Mathematical Practice Standards

1

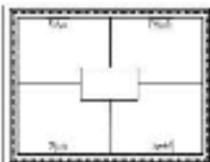
PERSEVERE



I can make sense of problems and make a plan to solve them.

2

REPRESENT



I can use numbers, words, pictures, and objects to solve a problem.

3

EXPLAIN



When solving a problem, I can explain my thinking and try to understand others.

4

MODEL



I can show my thinking and work in many ways.

5

TOOLS



I can use math tools and tell why I chose them.

6

ACCURATE



I can be careful and accurate when I use math symbols, labels, vocabulary, and strategies.

7

STRUCTURE



I can break apart a problem using patterns and strategies that I know.

8

REPEATED REASONING



I can use the same thinking to solve different kinds of problems.

# How does math talk support learning?

## ∞ Benefits for students:

- Give students time to make sense of their thinking and the mathematics.
- Build confidence in communication skills.
- Listen to how peers solved the same problem.

## ∞ Benefits for teachers:

- Learn how students are thinking.
- Use as formative assessment.
- Uncover misconceptions or errors.

“One way is for teachers to think about leading **classroom discussions** in mathematics as they often do when teaching language arts. **Probing students' thinking during math lessons is valuable**, so that the goal is not only getting correct answers, but also **explaining why answers make sense.**”

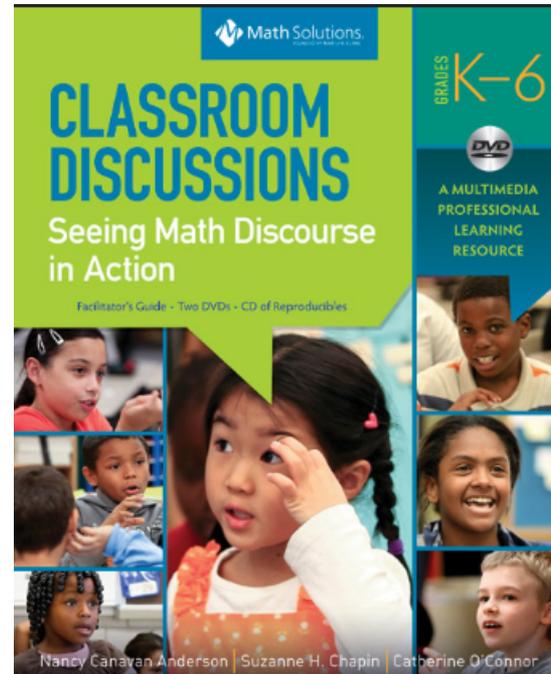


Marilyn Burns  
Education Week  
April 1, 2015

<http://www.edweek.org/ew/articles/2015/04/01/to-teach-math-study-reading-instruction.html>

# Why Talk Moves?

Introduction Video:  
Why Should We Use  
Talk Moves in the  
Mathematics  
Classroom?



**Turn and Talk:** What is your experience with students talking about math in your classroom?

# Two videos clips of math talk

*Looks like, Sounds like* – graphic organizer

## Talk Moves

Look like... 	Sound like... 
Next steps... 	

# Talk Moves



∞ Turn & Talk: What did you observe in the videos around students talking about math?

# Math Talk Moves

- ☞ Turn and Talk
- ☞ Repeat or Rephrase
- ☞ Agree or Different Perspective
- ☞ Add On

I have a different idea because...

My strategy is like yours because...

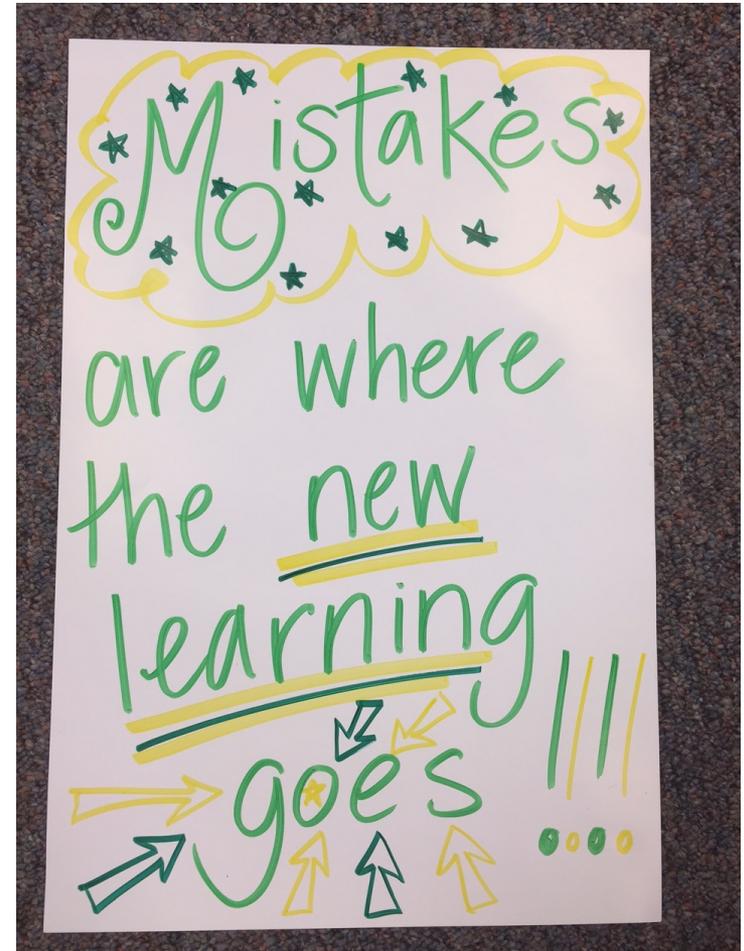
# Strategies for Developing Math Talk

How can you create meaningful discourse in a busy classroom?

## Goal 1: Respectful Discourse

## Goal 2: Equitable Participation

- ∞ Celebrate mistakes!
- ∞ Teach kids how to talk in pairs – focus on the physical set up of classroom.



# Strategies for Developing Math Talk

How can you create meaningful discourse in a busy classroom?

Goal 1: Respectful Discourse

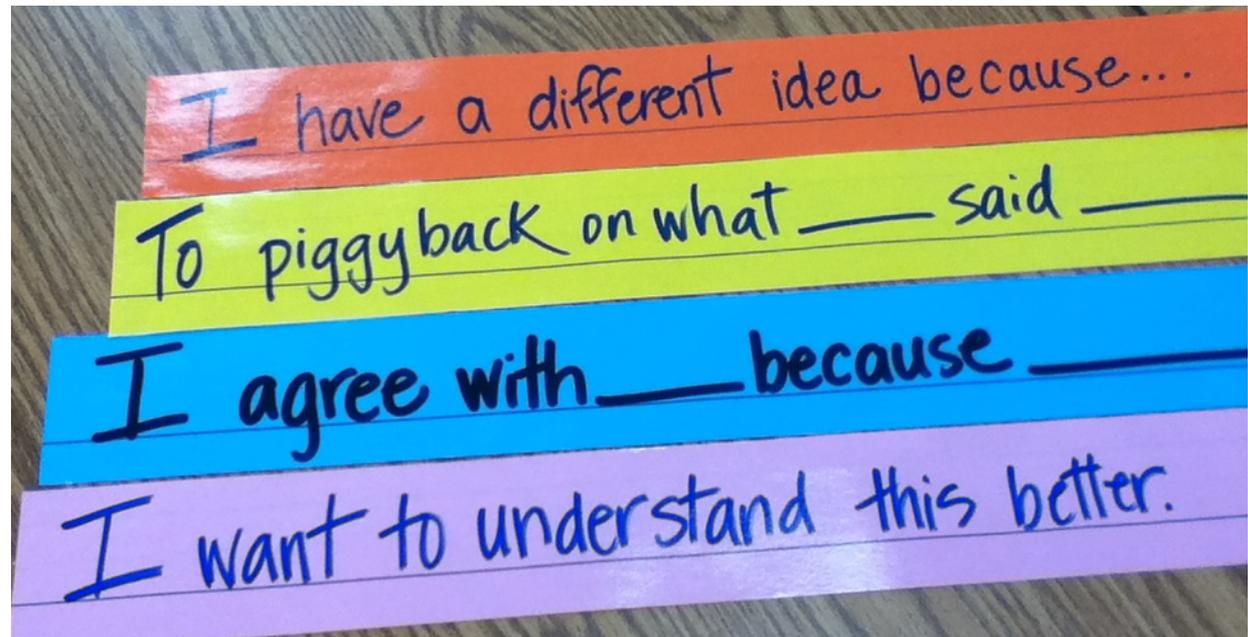
**Goal 2: Equitable Participation**

- ∞ Talk about math content that is accessible for all students.
- ∞ Give students the “heads up” they will be called on next.

# Strategies for Developing Math Talk

How can you create meaningful discourse in a busy classroom?

- ∞ Wait time, waiting, & being patient
- ∞ Use sentence starters and post these on the walls.



# Math Task

## Diego's Piggy Bank

- ⌘ What coins might be in the piggy bank?
- ⌘ Can you find all possible solutions?



# Diego's Piggy Bank

- ☞ Diego has 28 cents in his piggy bank. He shakes his piggy bank and hears some coins. What coins might be in Diego's piggy bank?
- ☞ Working with a partner, determine the coins that could be in the piggy bank
- ☞ Recording your thinking.
- ☞ What is the fewest number of coins that could be in piggy bank?



# Math Task

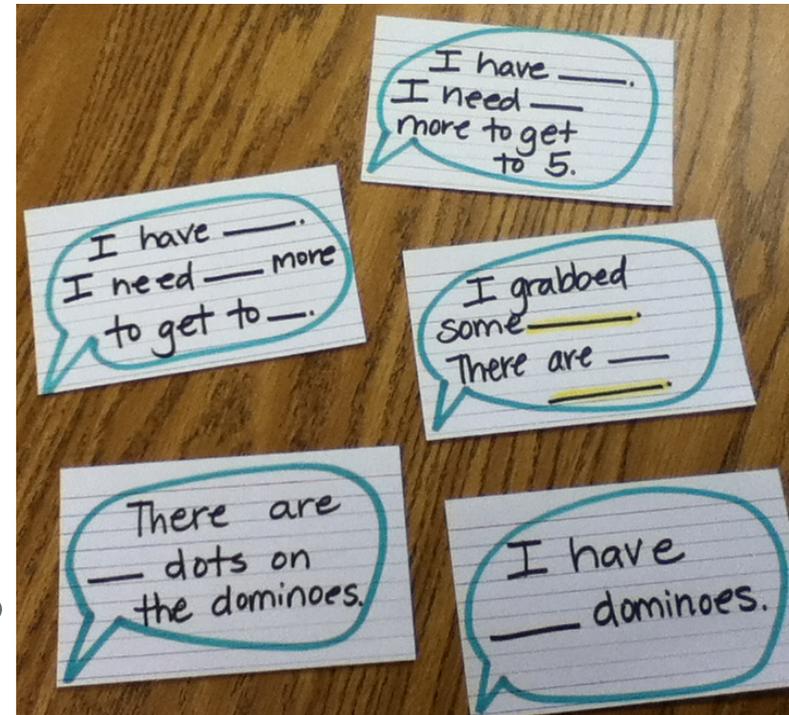
## Diego's Piggy Bank

- ⌘ What makes this task a good one for opportunities for student discourse?
- ⌘ What are characteristics of tasks that lead to opportunities for student discourse?



# Next Steps in Your Classroom

- ∞ How do you want math talk to look in your classroom?
- ∞ How can you support students to have success with math discourse?
- ∞ What sentence strips will you post in your classroom?



# Reflecting and thinking ahead...

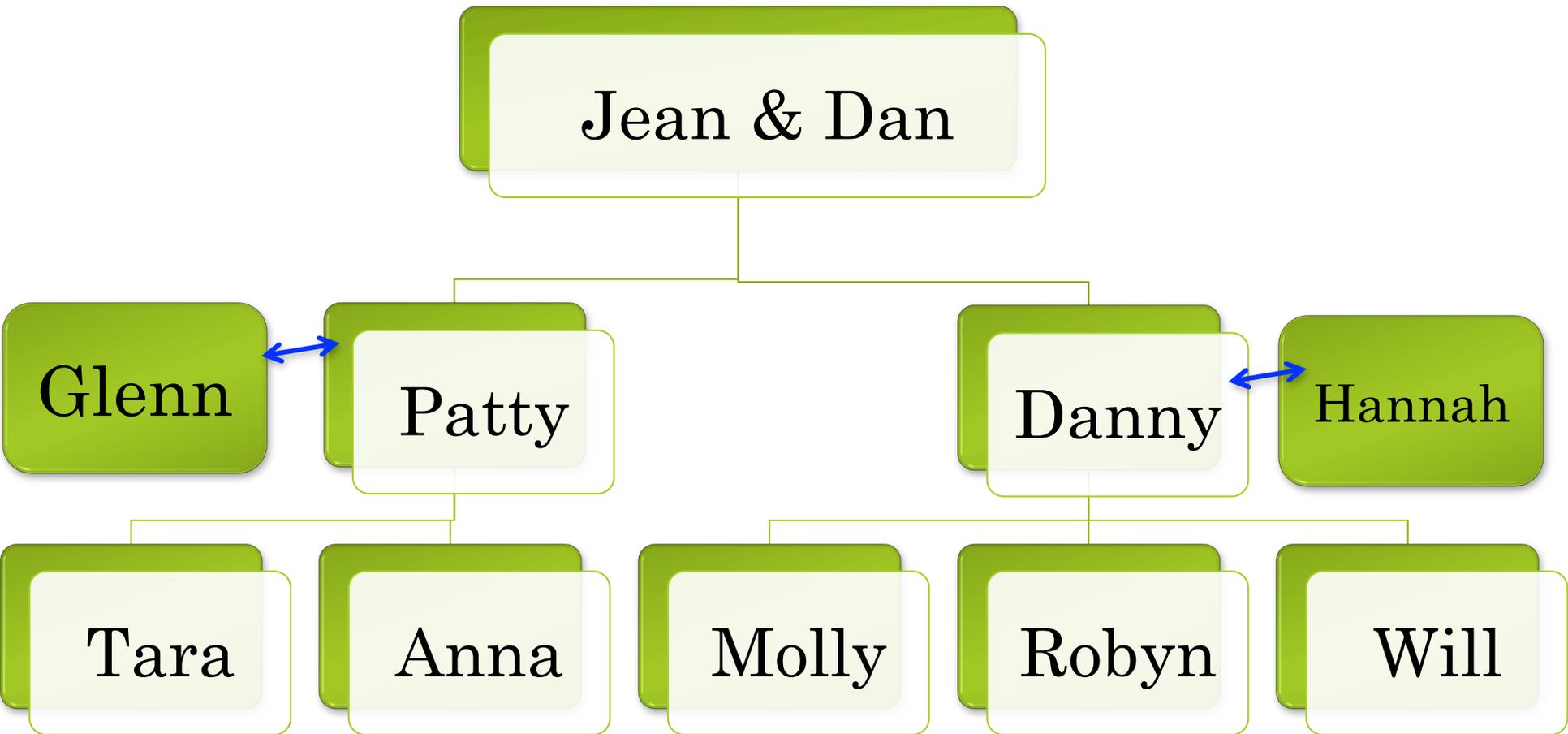
Including math talk in my classroom is important because...

To increase math talk in my classroom, my next step is...

One word on my mind

*Stay tuned for the solution to the family tree puzzle...*

# Logic Puzzle - Family Tree



**MOLLY & TARA ARE COUSINS!**

# *Contact Information*

**Molly Rawding**

[MollyRawding@gmail.com](mailto:MollyRawding@gmail.com)

**Tara McKenzie**

[TaraMck@gmail.com](mailto:TaraMck@gmail.com)

☞ Respond

☞ Repeat

☞ Restate

☞ Rebut

☞ Reinforce

☞ Calling Mulligan! Two Rules for Dynamic Discourse”  
by Lisa Arter in Education Update, February 2015  
(Vol. 57, #2, p. 8)