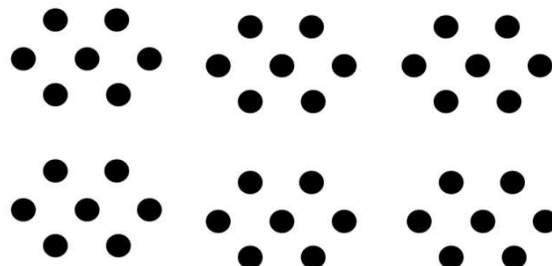
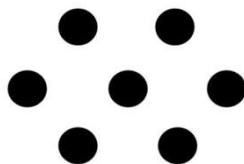


# High School Math Talks 101 - Getting Started

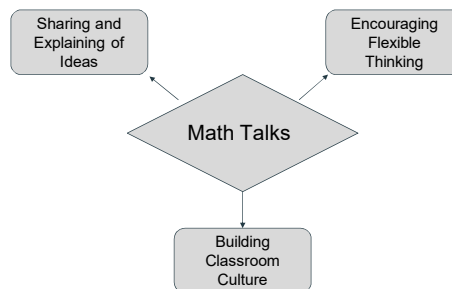
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Let's do a math talk

How many dots are there?  
Don't just count.



What are math talks?



## The Big Idea of Math Talks

- Help students learn to express their ideas
- Conceptual thinking over procedure
- All students feel safe sharing
- Valuing and encouraging diverse ideas

Adapted from *Making Number Talks Matter: Developing Mathematical Practices and Deepening Understanding, Grades 4-10* by Cathy Humphreys and Ruth Parker

## Math Talk Structure

- About 10 minutes
- Question or situation that is open-ended or has multiple solution pathways
- Students share ideas aloud to the class
- Teacher scribes students' ideas on board objectively

## Math Talk Routine

1. Paper and pencils away
2. Show problem
3. Students solve problem mentally and signal when done
4. Teacher records student answers on board
5. Teacher asks if anyone can explain their thinking
6. Students share strategies and teacher records
7. Teacher asks questions

Adapted from *Making Number Talks Matter: Developing Mathematical Practices and Deepening Understanding, Grades 4-10* by Cathy Humphreys and Ruth Parker

## Types

- Dot Talks
- Which One Doesn't Belong (WODB) Talks
- Number Talks
- Pattern Talks
- Content Talks

## Dot Talks

### What is a dot talk?

- Group of dots to visually count
- Looking for patterns
- Helps show multiple viewpoints

### Dot Talks - Obstacles and Tips

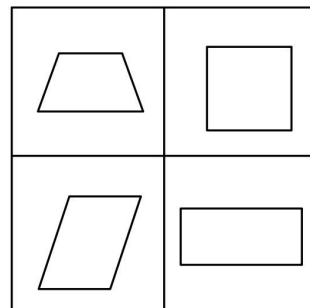
- Start with dot talks
  - Limit to a couple at the beginning
- Use to establish a culture of multiple solutions and sharing thinking

### Which One Doesn't Belong (WODB) Talks

#### What is a WODB talk?

- Which One Doesn't Belong
- Group of 4 choices (equations, graphs, shapes)
- Students decide which one is different from the others and justify
- All 4 choices can be justified

Which one of the shapes doesn't belong in the group? Why?



### WODB Talks - Obstacles and Tips

- Use to establish a culture of multiple solutions and sharing thinking
- Use to practice mathematical vocabulary
- Difficult to develop

#### Hand signals?

- Hand signals can be used by students to signal they are done thinking
- Private thumbs up
- Not required or necessary

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## Number Talks

### What is a number talk?

- Numerical calculation
- Multiple strategies for discovering answer
- One correct solution

11  
21

100 - 89

Handwritten student work for the problem 100 - 89. The work includes several strategies:

- A number line from 89 to 100 with jumps of +1 and +10, resulting in 100.
- A calculation:  $89 + 10 = 99$ , then  $99 + 1 = 100$ .
- A calculation:  $100 - 12 = 88$ , then  $88 + 1 = 89$ .
- A calculation:  $100 - 80 = 20$ , then  $20 - 9 = 11$ .
- A calculation:  $89 + 1 = 90$ , then  $100 - 90 = 10 + 1 = 11$ .
- A calculation:  $-100 + 89 = -11$ , then  $-11 + 1 = 11$ .

### Number Talks - Obstacles and Tips

- Don't use too many in a row
- Use to help students build fluency with numbers
- Use to help students develop strategies

## Pattern Talks

### What is a pattern talk?

- Picture pattern with predictable change
- Asks students to visualize patterns and generalize
- Various questions can be asked

What does the 5th figure look like? How many small cubes are in it?

Figure 0 Figure 1 Figure 2 Figure 3 Figure 4

Kersten  
 $\frac{1}{3}$   
 $\dots + \dots = \# \text{ of Squares}$

Brianna  
 Prev Fig  $\cdot 3 = \text{Next Fig}$   
 Fig 5 =  $81 \cdot 3 = 27 \cdot 3$

Kurtland

Anna  
 Exponential  
 Multiply by 3  
 $A_n = A_{n-1} \cdot 3$   
 $A(n) = 3^{n-1}$   
 $A(n) = 3 \cdot 3^n$

Carson  
 Up, Right, Back  
 add 2 of prev  
 shape

## Pattern Talks - Obstacles and Tips

- Ask a specific question
- Use to help students connect representations
- Use to help students see algebra visually

## Content Talks

## What is a content talk?

- Connected to current classroom content and curriculum
- Asks students to extend their thinking about topics
- Varied format

Consider the equation  $a \cdot b \cdot c \cdot d = 0$ . What values of  $a$ ,  $b$ ,  $c$ , and  $d$  would make the equation true?

Carson  
 $0 \cdot 20 \cdot 20 \cdot 20 = 0$

Brenden  
 $1 \cdot 2 \cdot 3 \cdot 0 = 0$

Shawn  
 1 of them = 0

$x = y$   
 $x + y = 8$   
 $x = 5 \quad y = 3$   
 $x = 4 \quad y = 4$   
 $x = 6 \quad y = 2$

## Content Talks - Obstacles and Tips

- Make sure the problem allows for multiple strategies or ways of thinking
- Use to introduce daily topic
- Use to review or expand prior thinking and understanding

## Planning a Math Talk

- Anticipate different strategies
- How will you record each of these strategies?
- What questions might you ask to fully understand student thinking and/or method?
- Reflect - How did it go? What next?

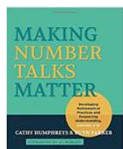
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## Resources

- [www.visualpatterns.org](http://www.visualpatterns.org)
- [Wodb.ca](http://Wodb.ca)
- [Numberstrings.com](http://Numberstrings.com)
- [MathTalks.net](http://MathTalks.net)

## References

*Making Number Talks Matter: Developing Mathematical Practices and Deepening Understanding, Grades 4-10* by Cathy Humphreys and Ruth Parker



Questions?

Share your experiences with us!

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