



Give Them Something to Talk About

Using Math Discourse to Increase Student Learning

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MIND
RESEARCH INSTITUTE

MISSION



To ensure that all students are mathematically equipped to solve the world's most challenging problems.



Launch



Learning Goals:



Discourse 0.82



Teacher Clarity 0.75

- ❖ Experience and identify teacher moves and tasks that support productive mathematical discourse in the classroom.
- ❖ Understand the framework of Teacher Clarity.
- ❖ Experience formative assessment opportunities, create deeper mathematical understanding, to build mathematical fluency.



Visible Learning for Mathematics. What Works Best to Optimize Student Learning.

John Hattie, Douglas Fisher, Nancy Frey with Linda M. Gojak, Sara Delano Moore, William Mellman

Teacher Clarity

1. Clarity of *organization*
2. Clarity of *explanation*
3. Clarity of *examples* and *guided practice*
4. Clarity of *assessment of student learning*



THINGS TO THINK ABOUT

Research tells us that complex knowledge and skills are learned through social interactions (**Vygotsky** 1978; Lave and Wenger 1991). Social interaction provides us with the opportunity to use others as resources, to share our ideas with others, and to participate in the joint construction of knowledge.

THINGS TO THINK ABOUT

My definition of a good teacher has changed from “one who explains things so well that students understand” to “one who gets students to explain things so well that they can be understood.”

(Steven C. Reinhart, “Never Say Anything a Kid Can Say!” *Mathematics Teaching in the Middle School* 5, 8 {2000}:478)

Number Talks vs. Math Talk

- Mental Math to develop Flexibility with numbers and computational fluency
- Purposefully chosen number strings.
- 10-15 min. Daily routine
- Focus on Mathematical Practices 3 & 6

Making Number Talks Matter. Developing Mathematical Practices and Deepening Understanding, Grades 4-10. Cathy Humphreys & Ruth Parker



Number Talks vs. Math Talk

- Talk develops mathematical communication skills
- Talk can reveal understanding and misconceptions
- Talk supports robust learning by boosting memory
- Talks supports deeper learning
- Talk may focus on any or all of the 8 Mathematical Practices

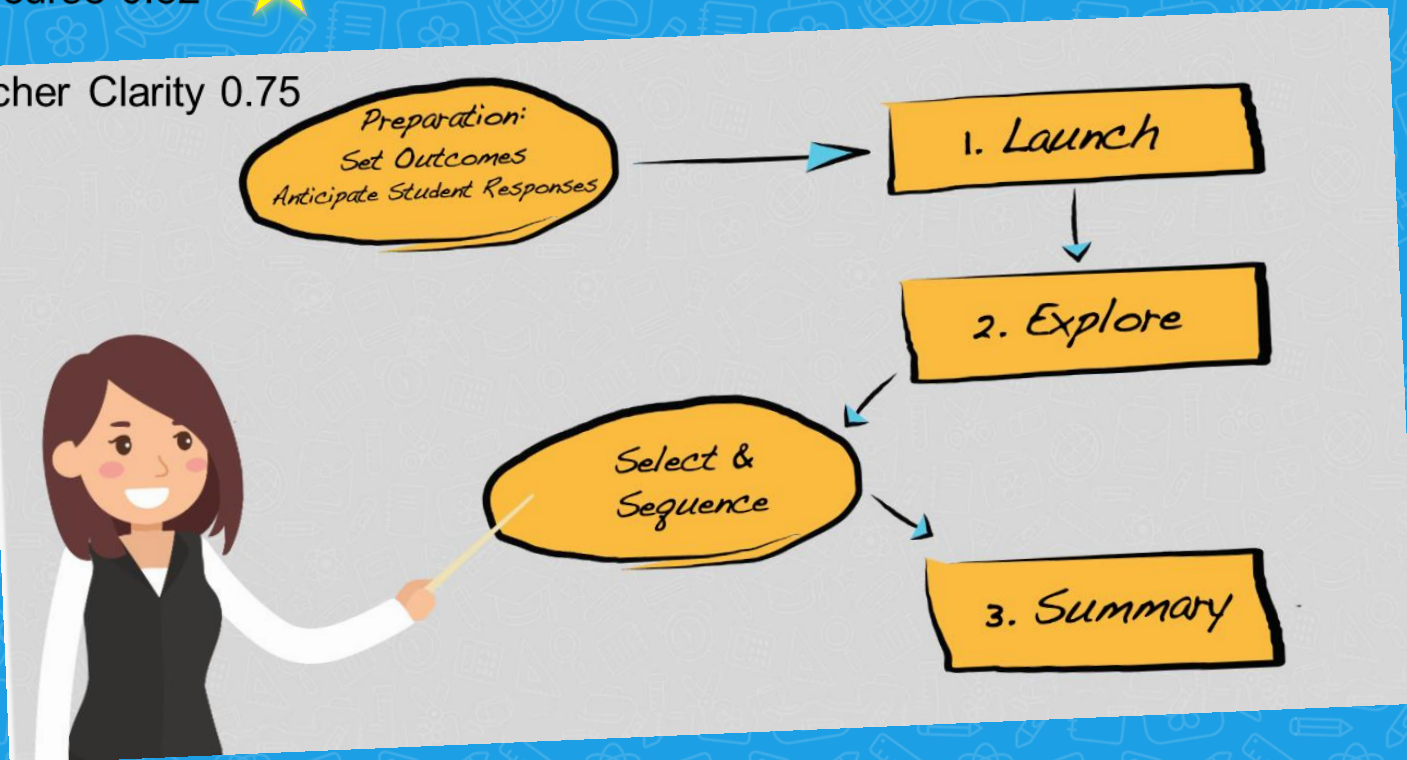
Making Number Talks Matter. Developing Mathematical Practices and Deepening Understanding, Grades 4-10. Cathy Humphreys & Ruth Parker



Discourse 0.82



Teacher Clarity 0.75



MP.1: Make sense of problems and persevere in solving them
MP.3: Create viable arguments and critique the reasoning of others

STANDARDS FOR MATHEMATICAL PRACTICES



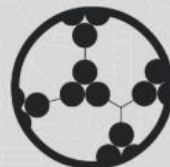
**Make Sense & Persevere
In Solving Problems**



**Reason Abstractly and
Quantitatively**



**Construct Viable
Arguments and
Critique the Reasoning
of Others**



**Model with
Mathematics**



**Use Appropriate Tools
Strategically**



Attend to Precision



**Make Use of
Structure**



Repeated Reasoning

TALK MOVES THAT ENGAGE STUDENTS IN DISCOURSE



- Wait time (Think time)

- Revoice

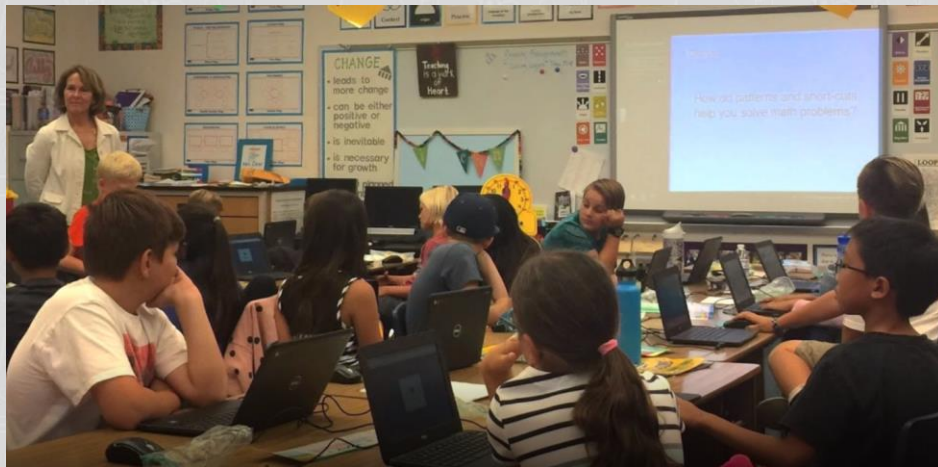
- Repeat/rephrase



- Agree or disagree and why

- Add on

- Partner talk



Intentional Talk. How to Structure and Lead Productive Mathematical Discussions. Elham Kazemi & Allision Hintz



Explore

stmath.com

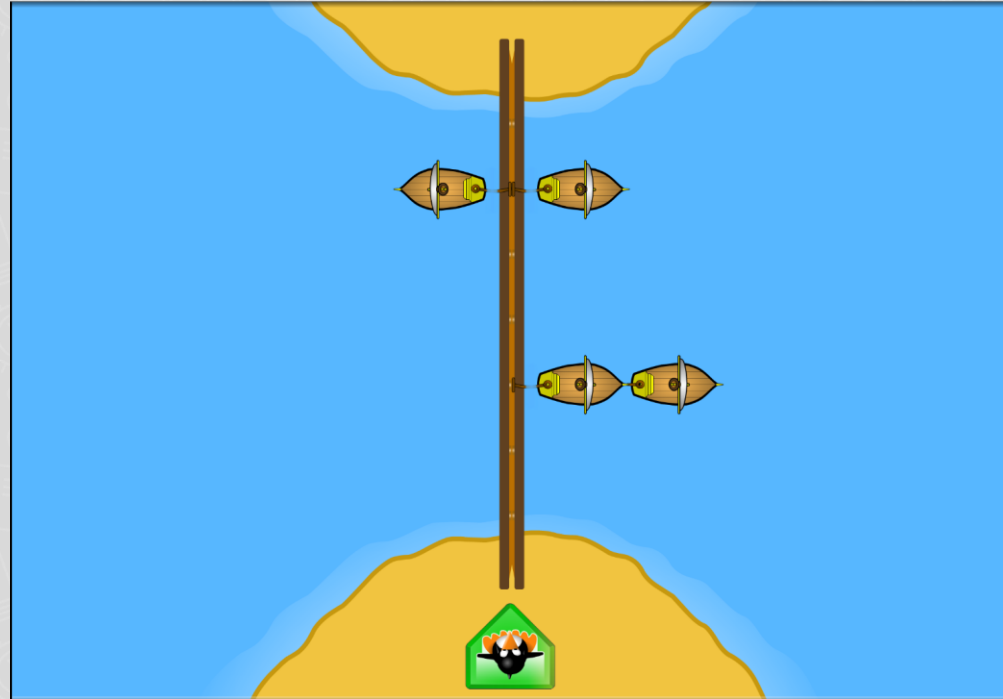
un: mindlearning

pw: stmath

Focus:

MP1: Make sense problems and persevere in solving them

MP3: Construct viable arguments and critique the reasoning of others



What Strategies did you use?

MP.1: Make sense of problems and persevere in solving them
MP.3: Create viable arguments and critique the reasoning of others



Hmmm...

What does this look like for $5 = n + 3$

1.OA.1



Talk Moves that Help Students Clarify and Share their Own Thoughts

www.brainybetty.com

Before we get to what we talk about, we need to focus on how we talk about it.

- Turn-and-Talk (partner talk or think-pair-share)
- Revoicing (verify and clarify)
- Say More



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QUESTIONS TO FACILITATE STUDENTS THINKING



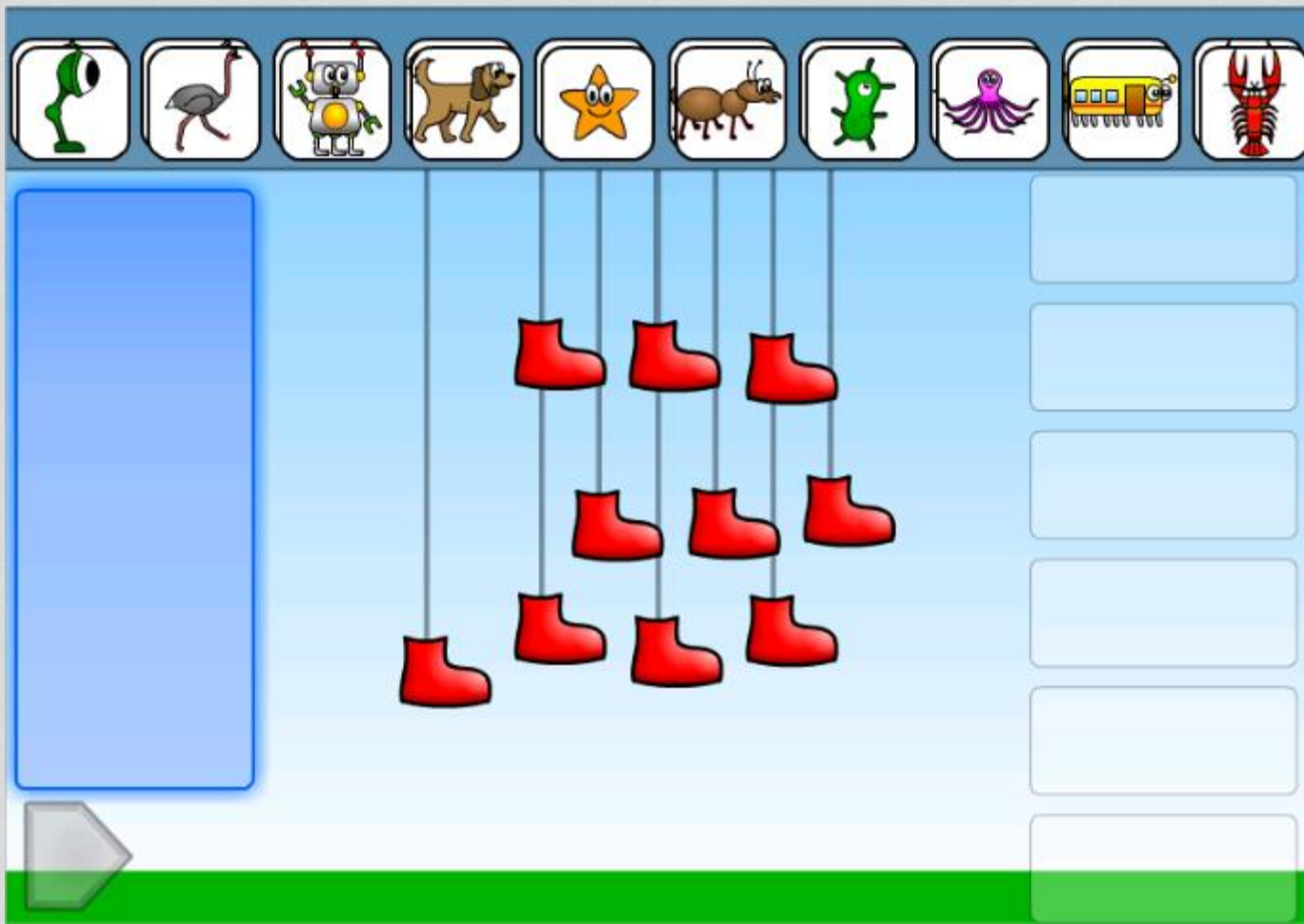
What questions will help students ***focus*** on the problem?



What questions will help you ***uncover*** the students' thinking?



What questions will help ***advance*** student thinking?



What Strategies did you use?

What Discourse would you plan for?

MP.1: Make sense of problems and persevere in solving them
MP.3: Create viable arguments and critique the reasoning of others





Summary

What does this look like for

$$5 = n + 3?$$

- What questions will help students **focus** on the problem?
- What questions will help you **uncover** the students' thinking?
- What questions will help **advance** student thinking?





Intentional Talk. How to Structure and Lead Productive Mathematical Discussions. Elham Kazemi & Allison Hintz

Principles to Actions. Ensuring Mathematical Success for All. NCTM

Visible Learning for Mathematics, Grades K-12: What Works Best to Optimize Student Learning. John Hattie, Doug Fisher, Nancy Frey, Linda Gojak, Sara Delano Moore, William Mellman

5 Practices for Orchestrating Productive Mathematics Discussions. Margret Smith, Mary Kay Stein

Making Number Talks Matter. Developing Mathematical Practices and Deepening Understanding, Grades 4-10. Cathy Humphreys & Ruth Parker



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Thank You!