Promoting Equity & Access in Mathematics through Discourse

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The Fraction Splat! Series

Set 12.3

This set includes Instant Splats! and unit fractions.

Click to download the original 50 Splat! lessons or click to download The Fraction Splat! Series.

Steve Wyborney

Session Agenda

- Why discourse as a tool for access and equity?
- Where can discourse happen in the classroom?
- Establishing a classroom environment for discourse
- Task Creation/Selection
- Strategies for Teachers and Students

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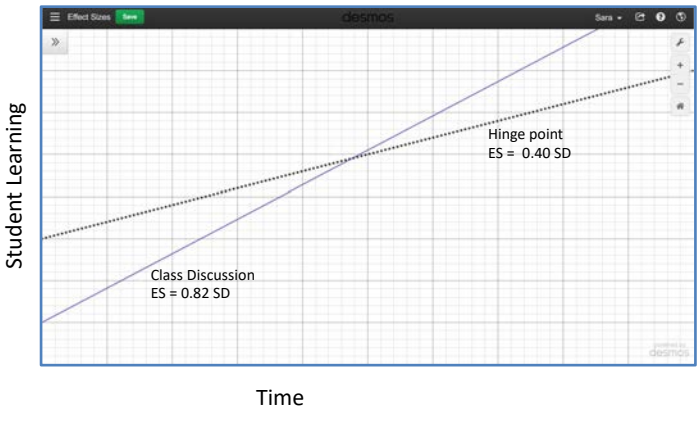
Why discourse as a tool for access and equity?



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Why discourse as a tool for access and equity?

– Classroom discussion	0.82
– Self-verbalization & self-questioning	0.55
– Vocabulary development	0.62
– Help-seeking	0.72
– Feedback	0.70
– Questioning	0.48
– Cooperative vs Competitive Learning	0.53
– Summarization	0.79

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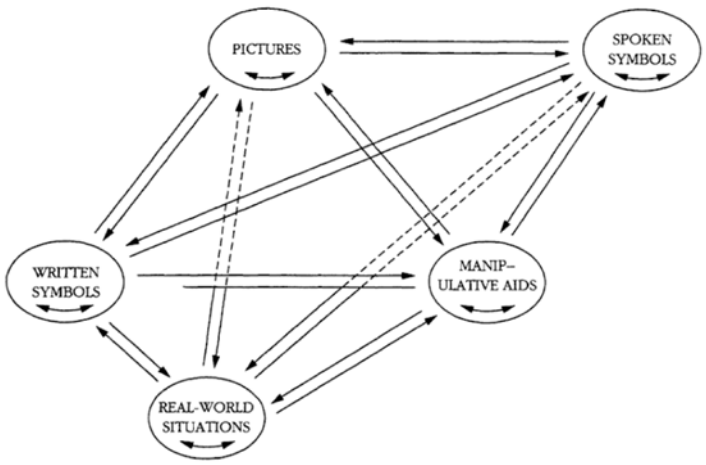
Why discourse as a tool for access and equity?



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The Hidden Lives of Learners

There is no question that there are significant differences in the educational attainment of students with different ethnic and cultural backgrounds, and that this is a very serious concern…. But there is no evidence that these differences in attainment arise from differences in the way members of different ethnic or cultural groups actually learn. … [T]he differences in attainment arise from the experiences these students have…. Until we have better evidence, it is wise to locate the problem in teaching and the culture of teaching rather than in the nature of the student.

The Hidden Lives of Learners, Graham Nuthall, 2007

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Learning Worlds of Students

- *Public world that the teacher sees and manages*
- *Semi-private world of ongoing peer relationships*
- *Private world of the child's own mind*

- If we can't see all three of these, we don't know what learning is happening.

The Hidden Lives of Learners, Graham Nuthall, 2007

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PAUSE AND REFLECT

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Where does discourse happen in the classroom?

- Lesson Opening Routines
- Student Talk in Whole Class Lessons
- Learning Centers/Stations
- Student Talk in Small Group Lessons
- Games
- Problem-Solving Tasks
-

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How do teachers stay aware of the conversation?

- Routines to increase student participation & engagement.
- Encouraging visual and manipulative representations to give something to talk about.
- Make time to listen
- Ask students what they need
- Keep notes
-

Establishing a classroom environment for discourse

- What about introverts? What about extraverts?
- What about English Language Learners?
- What about students who ”aren’t math people”?
- What about…

Language Learning Intentions/Success Criteria

- Using vocabulary in conversation.
- Explaining my thinking to group members.
- Using sentence frames.
- Captioning my picture of the math.
-
-
- Social Learning Intentions are also appropriate.

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Task Creation/Selection

- Relevance/Meaning for Students
  - How could this problem be revised?
- Tasks with multiple entry points

- *MaryAnn needed 0.75 square feet of gold leaf to decorate her jewelry box. The package of gold leaf said that one side of the piece was 0.5 feet long. How long is the piece she will need to cut?*

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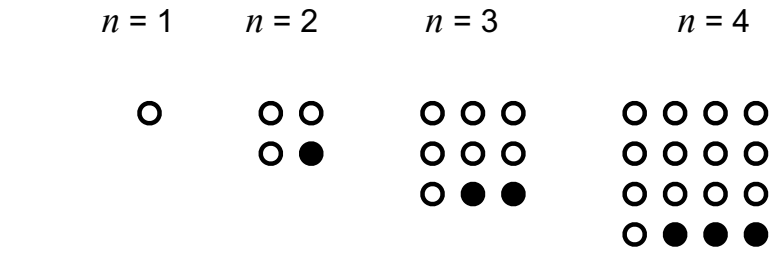
Dot Diagrams



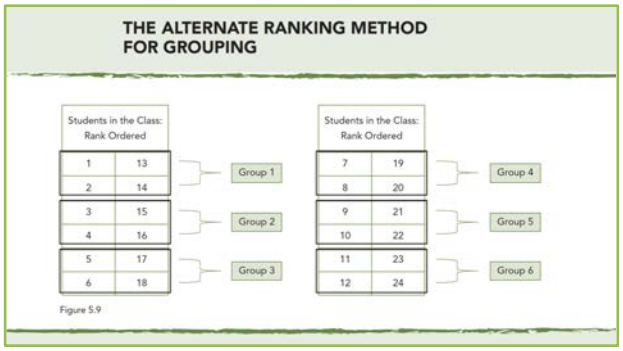
Projector Resources

Generating Polynomials from Patterns

www.Map.mathshell.org

Strategies to Consider

- Grouping Strategies



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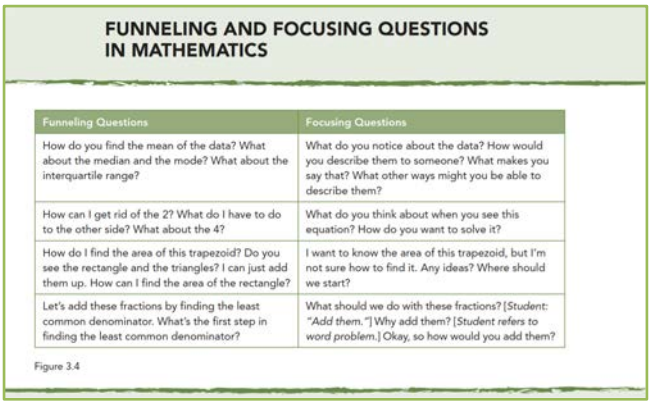
Strategies to Consider

- Grouping Strategies
- Question Types



FUNNELING AND FOCUSING QUESTIONS IN MATHEMATICS

Funneling Questions	Focusing Questions
How do you find the mean of the data? What about the median and the mode? What about the interquartile range?	What do you notice about the data? How would you describe them to someone? What makes you say that? What other ways might you be able to describe them?
How can I get rid of the 2? What do I have to do to the other side? What about the 4?	What do you think about when you see this equation? How do you want to solve it?
How do I find the area of this trapezoid? Do you see the rectangle and the triangles? I can just add them up. How can I find the area of the rectangle?	I want to know the area of this trapezoid, but I'm not sure how to find it. Any ideas? Where should we start?
Let's add these fractions by finding the least common denominator. What's the first step in finding the least common denominator?	What should we do with these fractions? [*Student: "Add them."*] Why add them? [*Student refers to word problem.*] Okay, so how would you add them?

Figure 3.4

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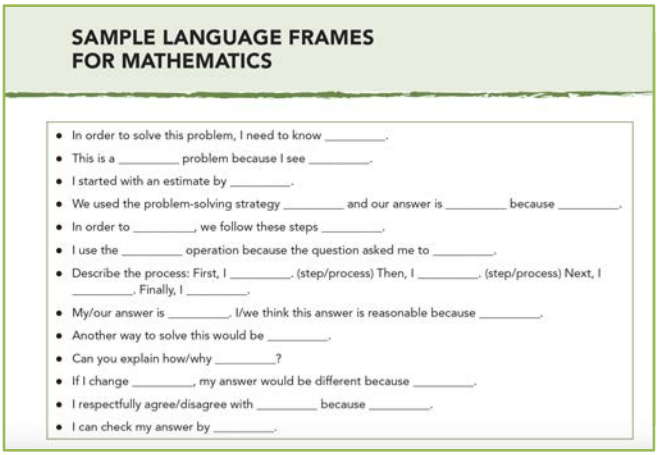
Strategies to Consider

- Grouping Strategies
- Question Types
- Language Frames



SAMPLE LANGUAGE FRAMES FOR MATHEMATICS

- In order to solve this problem, I need to know _____.
- This is a _____ problem because I see _____.
- I started with an estimate by _____.
- We used the problem-solving strategy _____ and our answer is _____ because _____.
- In order to _____, we follow these steps _____.
- I use the _____ operation because the question asked me to _____.
- Describe the process: First, I _____. (step/process) Then, I _____. (step/process) Next, I _____. Finally, I _____.
- My/our answer is _____. I/we think this answer is reasonable because _____.
- Another way to solve this would be _____.
- Can you explain how/why _____?
- If I change _____, my answer would be different because _____.
- I respectfully agree/disagree with _____ because _____.
- I can check my answer by _____.

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