


**Amplifying Students' Mathematical Brilliance: Empowering Student Voice Through Function Exploration**

High School



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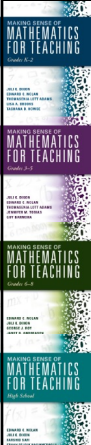
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High School

Lybrya Kebreab, Ph.D.  
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**Handout**



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**Let's Get Ready**

Which One Doesn't Belong? Why?

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**Connecting to Discourse**

"Effective teaching of mathematics facilitates discourse among students to build shared understanding of mathematical ideas by analyzing and comparing student approaches and arguments."

(National Council of Teachers of Mathematics, 2014, p. 10)

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**Check-in**

- What's been going well about amplifying student voice through mathematics discourse?
- What's still challenging about amplifying student voice through mathematics discourse?

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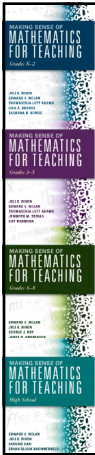
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### Session Goals

- Be intentional about centering student voice while facilitating mathematical discourse.
- Examine discourse norms and instructional shifts for amplifying student voice.
- Select tasks that invite each and every learner to actively engage in mathematical discourse.

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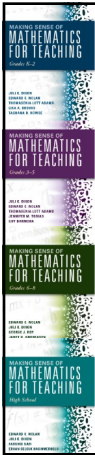
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### Mathematical Discourse

- Mathematical discourse is the exchange of thought within and among students and teachers in the mathematics classroom.
- How can we amplify student voice **through** effective facilitation of mathematics discourse?

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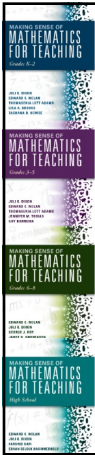
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### Which Function is Greater?

$$f(x) = 2x$$

$$g(x) = x+2$$

$$h(x) = x^2$$

$$l(x) = 2^x$$

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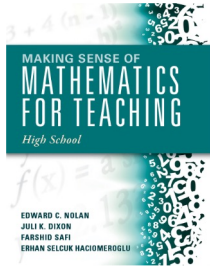
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MAKING SENSE OF MATHEMATICS FOR TEACHING  
High School

EDWARD C. NOLAN  
JULI K. DIXON  
FARSHID SAFI  
ERHAN SELCUK HACIOMEROGLU

Making Sense of Mathematics for Teaching  
High School

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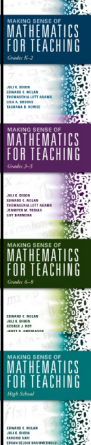
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### Reflections

How did the teacher set up the lesson to support mathematical discourse?

What did you observe about the ways students engaged in mathematical discourse?

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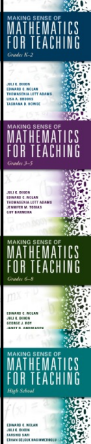
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### Engaging Students Through Mathematical Discourse

"In addition to explicitly teaching features of language (e.g., specialized mathematical language and syntax of mathematical statements) teachers are responsible for providing students with opportunities to engage in mathematical discourse across different modalities (e.g., speaking and writing)".

(Smith, 2021)

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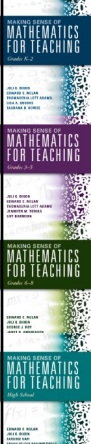
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## Plan with the TQE Process in Mind



- Select appropriate **T**asks to support identified learning goals,
- Facilitate productive **Q**uestioning during instruction to engage students in the Mathematical Practices, and
- Collect and use student **E**vidence in the formative assessment process during instruction.

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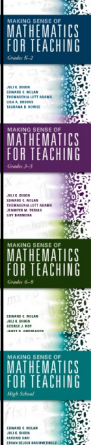
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## Engaging Students Through Mathematical Discourse

“In addition to explicitly teaching features of language (e.g., specialized mathematical language and syntax of mathematical statements) teachers are responsible for providing students with opportunities to engage in mathematical discourse across **different modalities** (e.g., speaking and writing)”.

(Smith, 2021)

**What are other modalities?**

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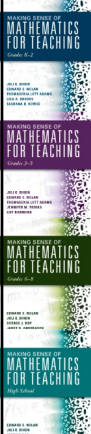
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## Teachers' Role in Promoting Mathematical Discourse

“Your approach to student talk ... helps determine the type of classroom learning community you and your students develop together”.

(Nolan, Dixon, Roy, & Andreasen, 2016, p. 10)

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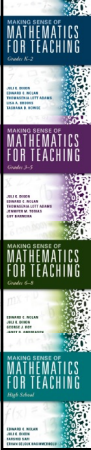
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### Norms to Amplify Student Voice in Mathematical Discourse

"The classroom norms need to support the active thinking of students rather than the thinking of teachers...[we] should always provide students the opportunity to share their strategies and make sense of the thinking of other students in order to be sure they understand mathematics with depth".

(Nolan, Dixon, Roy, & Andreasen, 2016, pg. 11)



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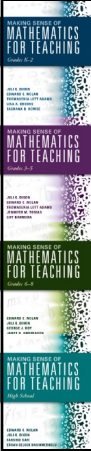
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### Norms to Amplify Student Voice in Mathematical Discourse

1. What do you want discourse to look/sound like?
2. What steps can you take to be intentional about promoting discourse?
3. What characteristics of tasks might encourage discourse?
4. How can you prepare for each and every learner to have an opportunity to engage in discourse?

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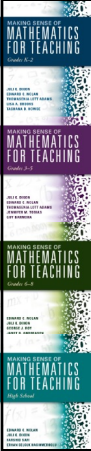
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### Honoring Students' Voice

- Plan and prepare for mathematical discourse.
- Be intentional about engaging each and every student.
- Value all each and every student's contribution to mathematical discourse.
- Be a participant in discourse.

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## Honoring Students' Voice

"The value of student talk in mathematics lessons cannot be overemphasized. As students describe and evaluate solutions to tasks, share approaches, and make conjectures, learning will occur in ways that are otherwise unlikely to take place."

(Van De Walle, Karp, & Bay-Williams, 2013, p. 42)

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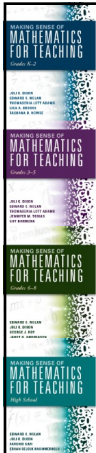
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## Revisit Session Goals

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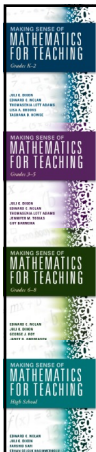
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