

Let's Get Talking About Math

EL AND MATH... REALLY?

Introduction

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The Vision Behind Our Partnership

Math Coaches:	EL Teachers:
<ul style="list-style-type: none">• Studying standards over two years• Aligning instruction• Developing grade level math targets• Providing district level professional development	<ul style="list-style-type: none">• Developing language that supports math standards• Moving math vocabulary from receptive to productive• Providing models of integrating language with math instruction

About District 196: Rosemount, Apple Valley, Eagan

- 4th largest district in Minnesota (27,500 students)
- 18 Elementary Schools (1 STEM magnet), 6 Middle Schools (1 STEM magnet), 4 Comprehensive High Schools
- 6.5 % of students are English Learners
- 16 % of students receive Special Education services
- 23.4 % of students are eligible for free school meals

Our Goals for Today

To explore strategies to help students in grades K through 5 use academic math language

- To **leave with a plan** for how your district could:
- foster collaboration between math and EL stakeholders
 - create math language targets
 - share the plan through professional development

Vocabulary vs. Language

Students need more than words alone to communicate about math.

Word	triangle
Sentence	This triangle has three corners and three sides.
Discourse	Discuss patterns as part of calendar.

The Features of Academic Language operate within sociocultural contexts for language use.

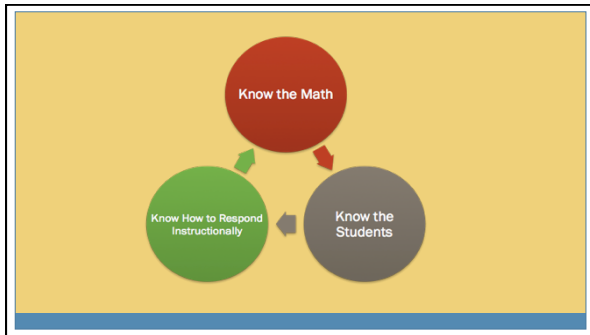
	Performance Criteria	Features
Discourse Level	Linguistic Complexity <i>(Quantity and variety of oral and written text)</i>	Amount of speech/written text Structure of speech/written text Density of speech/written text Organization and cohesion of ideas Variety of sentence types
Sentence Level	Language Forms and Conventions <i>(Types, array, and use of language structures)</i>	Types and variety of grammatical structures Conventions, mechanics, and fluency Match of language forms to purpose/perspective
Word/Phrase Level	Vocabulary Usage <i>(Specificity of word or phrase choice)</i>	General, specific, and technical language Multiple meanings of words and phrases Formulaic and idiomatic expressions Nuances and shades of meaning Collocations

Math Guiding Principles

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Five Guiding Principles of Bridges Resources

1. Math is more than arithmetic.
2. Understanding is just as important as fluency.
3. Visual models help us remember and invent important mathematics.
4. Problem solving is central to mathematics instruction.
5. Math is a social activity.



Professional Development Plans...

- Short webinars showing language integration strategies in action
- Teacher planned, filmed, and edited to address expressed needs
- Were filmed during Camp Propel summer school

Rationale for Webinars

- Responds to teacher concerns about absences for professional development
- Teams can work together at their own speed
- \$0.54 ppu

What we did...

- Started with math targets grades K-5
- Were inspired by WIDA
- Adapted language supports with all students in mind
- Strived for teacher friendly language
- Provided clear examples of target language

Math Concepts	Trimester 1	Trimester 2	Trimester 3
Number Sense	<p>K.1.1.1</p> <ul style="list-style-type: none"> I can say how many objects are in a set. I can show which object is first, second, third, fourth, fifth, etc. <p>Language Objectives: I can say numbers 1-10. I can say ordinal numbers to "tenths".</p> <p>K.1.1.2</p> <ul style="list-style-type: none"> I can read numbers from 0 to 31. (checkpoint for trimester 1 is up to 10.) I can write numbers from 0 to 31. (checkpoint for trimester 1 is up to 10.) I can show numbers from 0 to 31 in different ways (pictures, numbers, objects, picture graphs, etc.). (checkpoint for trimester 1 is up to 10.) <p>Language Objectives: I can say numbers to 10. I can say how many I have using 1 have 6 blocks.</p>	<p>K.1.1.1</p> <ul style="list-style-type: none"> I can say how many objects are in a set. I can show which object is first, second, third, fourth, fifth, etc. <p>Language Objectives: I can say numbers 1-20. I can say ordinal numbers to "twentieth".</p> <p>Possible Language Needed:</p> <ul style="list-style-type: none"> What teen means and numbers that finish with this word and the manipulative representation. <p>K.1.1.2</p> <ul style="list-style-type: none"> I can read numbers from 0 to 31. (checkpoint for trimester 2 is up to 20) I can write numbers from 0 to 31. (checkpoint for trimester 2 is up to 20.) I can show numbers from 0 to 31 in different ways (pictures, numbers, objects, picture graphs, etc.). <p>Language Objectives: I can say numbers to 31. I can say how many I have using 1 have 6 blocks.</p>	<p>K.1.1.1</p> <ul style="list-style-type: none"> I can say how many objects are in a set. I can show which object is first, second, third, fourth, fifth, etc. <p>Language Objectives: I can say numbers 1-31. I can say ordinal numbers to "thirty-first".</p> <p>Language Needed: Explicit use of numbers (Counting) and cardinal numbers (Positional numbers)</p> <p>K.1.1.2</p> <ul style="list-style-type: none"> I can read numbers from 0 to 31. I can write numbers from 0 to 31. I can show numbers from 0 to 31 in different ways (pictures, numbers, objects, picture graphs, etc.). <p>Language Objectives: I can say numbers to 31.</p>

Tour the room...

- How could you use the materials to facilitate talk?

Moving language from receptive to productive...

Receptive: hear and understand
Productive: use in talking and writing

- Create opportunities for talk
- Provide models and support for language beyond vocabulary



Strategies to move
language from being
receptive to productive

Strategies

Incorporate math talk into your calendar

- graph weather and student attendance
- designate a “math helper” responsible for reporting the weather or kid count
- feature patterns on your calendar
- ask students to predict the next item

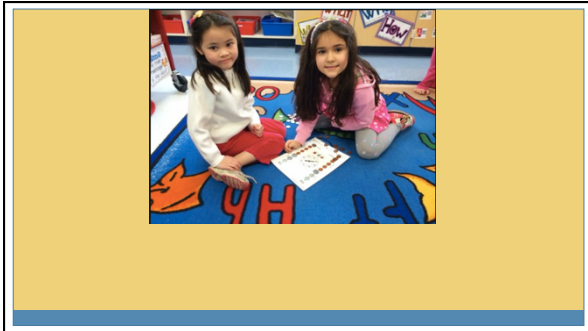


Strategies

Use student workplaces/hands-on stations or games and frequent partner work

- Use partnered math games and stations
- Have a written report / exit slip from the station or game
- Allow time for students to share with a partner, teacher, or the group
- Model manners: "Congratulations, you won!"

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Strategies

Model thinking aloud

- Use a math read-aloud or big picture prompt
- Illustrate and model story problems
- Narrate when you're solving a problem
- Ask students to narrate their problem solving
- Elicit different approaches to problem solving: "Did anyone solve that problem another way?"



Strategies

Have students write about math by sharing what they've read about math.

- Create browsing book baskets on a math concept
- Have a sheet for students to share something they learned or connected with in a book.
- Encourage students to create their own page or story like the author's story.
- Allow students time to share their writing with a partner, teacher, or class.

Strategies

Encourage students to write, draw, and share examples

- Use whiteboards during whole group instruction. Ask students to :
 - Show a partner how they solved the problem
 - Show how they thought about the problem
 - Show a number or concept multiple ways (direct modeling and number sentence)

Strategies

Encourage students to show and share thinking using math tools

- Polydrons
- Geoboards
- Tangrams
- Attribute blocks
- Sorting mats
- Measurement tools
- Unifix cubes



Thank you for attending our session!

Congratulations, you've earned an EL and Differentiated Instruction CEU.

Feel free to contact us with questions.

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