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Achievement in Mathematics

Supporting English Language Learners in Math in Regular or Mainstream Classrooms

Presenters

Patty Clark, Moderator

Education Consultant

Math Solutions

Rusty Bresser

Lecturer and supervisor of teacher education at the University of California at San Diego

Kathy Melanese

Distinguished bilingual Teacher in Residence in the Education Studies Program at the University of California at San Diego

Co-authors of ***Supporting English Language Learners in Math Class: A Multimedia Professional Learning Resource***

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Why Is It Important to Address the Needs of English Language Learners During Math?

- The number of ELL students in mainstream classrooms continues to grow
- Although math uses symbols, learning is still mediated through language
- Limitations in language can lead to limitations in learning mathematical content
- Assessment and monitoring of learning is best done through language

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Agenda

- The Goals of Instruction for English Language Learners
- Challenges Facing English Language Learners during Mathematics Instruction
- Strategies for Providing Access to Math Content and Understanding
- Questions and Answers

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Supporting English Language Learners in Math

Rusty Bresser

Lecturer and supervisor of teacher education at the University of California at San Diego

Staff development specialist

Kathy Melanese

Distinguished bilingual Teacher in Residence in the Education Studies Program at the University of California at San Diego

Teacher leader/presenter for the California Reading and Literature Project

Co-authors: ***Supporting English Language Learners in Math Class: A Multimedia Professional Learning Resource***

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The Goal: Giving Students Equal Access to Mathematics Content

- English language learners have the dual tasks of learning a second language and content simultaneously
- Just as language development cannot occur if we only focus on subject matter, content knowledge cannot grow if we only focus only learning the English language
- If math instruction and modes of communication are in English, ELL students will not have equal access to classroom discussions unless teachers provide extra support

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Linguistic Challenges Facing English Language Learners

- Math often uses specialized, or technical vocabulary which is often unknown or misunderstood
- Making math lessons comprehensible to students while also ensuring that they have the language needed to understand instruction and express their grasp of math concepts both orally and with written language (front loading)

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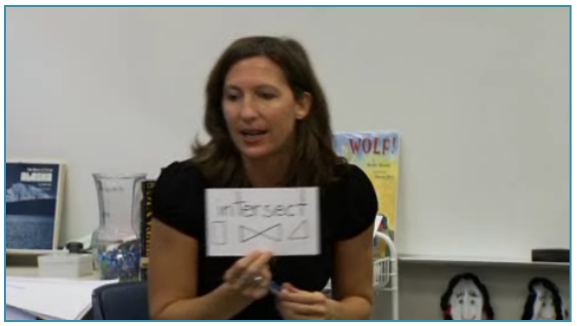
Determining the Linguistic Demands of a Lesson

- Identify specialized vocabulary (polygon, sides, vertices, corners, open, closed, curved)
- Use vocabulary banks



- Identify language structures and grammar needed to use the specialized vocabulary ("*The* shape *is not* a polygon *because it has* curved sides *and* it is open.")

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Language Functions and Sentence Frames

Language Functions and Sentence Frames			
Function	**Beginning**	**Intermediate**	**Advanced**
Summarizing	A ___ has ___ and ___. ___ is ___ and ___.	___ always have ___. Some ___ are ___ and some are ___.	In conclusion, ___ have ___ and ___; however, ___ are not always ___.
Examples	*A fraction has a numerator and a denominator.*	*Fractions always have numerators and denominators. Some numerators are smaller than the denominators and some are larger.*	*In conclusion, fractions have numerators and denominators; however, the numerators are not always smaller than the denominators.*
Sequencing	First, ___. Second, ___.	First ___, and then ___.	After ___, ___. Before ___, ___.
Examples	*First, I counted the red blocks. Second, I counted the blue blocks.*	*First, I put the blocks in groups of ten, and then I counted them.*	*After I put the blocks in groups of ten, I counted them.*

From *Supporting English Language Learners In Math Class.* Bresser, Melanese, Sphar. © 2009 Math Solutions Publications.

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Some Activities and Strategies that Support Learning Math and Academic English

- Set both language and content goals
- Ask questions that elicit explanations
- Design questions for different proficiency levels
- Use sentence frames to support receptive and expressive math/academic language development

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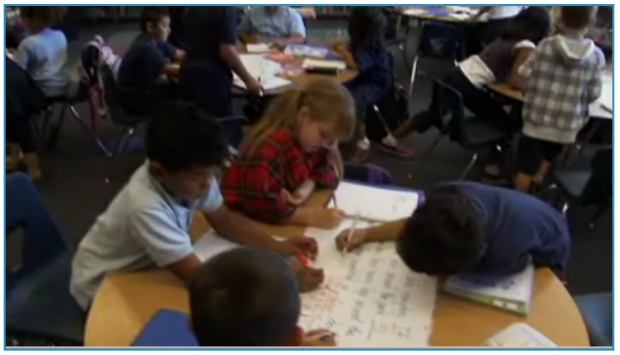
Set Language and Content Goals

- The language goal should support the math goal
- The language goal states how students will use language during the lesson



Students will…

- share their hypothesis in a small group
- describe a shape to a partner
- write a sentence summarizing a strategy used to solve a problem
- verbally compare the measurement of two figures.

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Ask Questions That Elicit Explanations

Asking good questions can prompt English language learners to discuss their thinking and elaborate on their ideas:

- What do you think the answer will be? Why do you think that?
- What is this problem about?
- What's the first thing you'll do to solve the problem?

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Design Questions for Different Proficiency Levels

Beginning level

- "Show me the circle."
- "Touch the larger number."
- "Is this a triangle or a circle?"

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Design Questions for Different Proficiency Levels

Intermediate level

- "What did you do first, second, and third to solve the problem?"

Advanced level

- "Tell me how you solved the problem."

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Math Sentence Frames…

- give students a chance to use new vocabulary in talking about the math content;
- provide students with exposure to and practice with the language of assessments;
- are different from “cloze” frames that measure reading comprehension; and
- are designed to have students use language that is just beyond what they could do independently (ZPD).

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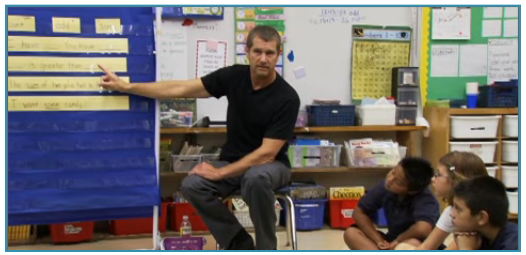
Sentence Frame Examples



Example frames for describing

Beginning

- *This is a _____. It is/has _____.*
- *This is not a _____. It is/has _____.*

Intermediate

- *This is a _____ because _____.*
- *This is not a _____ because _____.*

Advanced

- *This shape has _____ , _____ , and _____.*
- *This shape has _____ , _____ , and _____ ; therefore, it is a polygon.*

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Using Sentence Frames in Math Class

- Sequence for ensuring frames are utilized during the lesson
  - Teacher models
  - Practice together: guided practice
  - Independent practice: partner or small group talk
  - Build in time to talk and use frames during independent practice
  - Take it to writing

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Challenges Teachers Face

- Limited instructional time
- Limited resources and/or knowledge about effective strategies for teaching math to English language learners
- Teaching math content and specialized technical/academic language simultaneously
- Covering required math content for all students while also meeting the needs of ELLs

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Helping Teachers Meet the Challenge

- Start with what you know
- Take a chance – try out one new strategy at a time
- Do what works
- Work as a community
- Seek out resources in areas where you need support
- Be patient

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Remember…

- Hold high expectations for all of your students, including your English language learners
- Use strategies and activities that help your ELLs understand math content and talk about their math learning
- This is not *just* good teaching, these practices are *essential* in order to provide access to math instruction and content for ELLs

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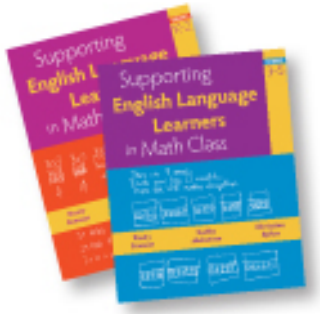
Math Solutions Support for English Language Learners

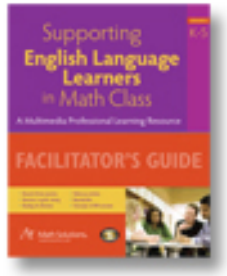
- Immersion Courses, School Year Courses, and School Based Coaching
- Math Solutions Publications

DVD

Two-Book Series



Facilitator's Guide



Take a guided tour!

Visit **mathsolutions.com/ELL**

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Survey: Rank These Topics in Order of Interest

Digging Into the Details on:

- Using sentence frames to develop receptive and expressive math/academic language
- Asking questions and using prompts that elicit explanations
- Designing questions for different proficiency levels
- Identifying and setting language and content goals for math lessons

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New ePD Webinar Series
Supporting ELLs in Math: an In-depth Look at Strategies and Activities

- **April 28**: Teaching math to ELLs: an introduction to the research and effective practices
- **May 5**: How to modify math lessons to support ELLs
- **May 12**: Scaffolding talk for ELLs during math
- **May 19**: Differentiating instruction for varying proficiency levels

Reserve your space at **mathsolutions.com/epd.**

(Please note date change)

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Question and Answer

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Thank you

Thank you for attending. A recording of this webinar will be posted on our site within 48 hours. Visit mathsolutions.com/webinar and click on *Archived Webinars*.

Please join us for our in-depth ePD Webinar series on supporting English language learners in math:

April 28, May 5, 12, 19

(Please note date change)

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mathsolutions.com
info@mathsolutions.com
800.868.9092