Teaching Mathematics to English Language Learners

Re-imagining TESOL
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Supporting English Language Learners in Math Class

Teachers of English language learners need to accomplish two goals with their students in mathematics:

- mathematical understanding and
- proficiency in English.

This session will highlight ways teachers can structure experiences to accomplish these two goals.
With a focus on supporting English language learners, in this session we will:

• Consider the demands for teaching and learning mathematics

• Explore a geometry task to determine the language demands in learning about polygons

• Observe and discuss lesson segments focusing on instructional strategies that make math comprehensible, provide opportunities for talk, and offer support for talk
Students must learn mathematics with understanding, actively building new knowledge from experience and prior knowledge.

Principles and Standards for School Mathematics, National Council of Teachers of Mathematics 2000
Students build their understanding when instruction provides opportunities to:

• Reason
• Solve problems
• Represent
• Make and use connections
• Communicate
It is important for all students, but especially critical for ELL students, to have opportunities to **speak, read, and listen** in mathematics classes, with teachers providing appropriate support and encouragement.

*Teaching Mathematics to English Language Learners*

*National Council of Teachers of Mathematics 2008*
Goals for English Language Learners in Math Class

• Actively engage in understanding mathematics

• Build English proficiency
What we’ll do:

• Investigate and analyze a math task
• Determine the language requirements
• Identify and categorize instructional strategies
• Observe classroom instruction (video)
• Engage in a reflective conversation
Math Goal:

Students will identify and describe the features of polygons and the features of figures that are not polygons.
Determining the Language Goal:

What language will students need to articulate their learning?

What could students say throughout the lesson to demonstrate they are learning the concept?

What is the key vocabulary?
Polygons

Not Polygons
Sorting Task

1. Sort the figures into two categories: *polygons* and *not polygons*.

3. Describe the figures as you sort them and give reasons for your decisions.

3. As you sort the figures, think about the key vocabulary words and language you used as you identified and sorted the shapes.
Language Demands

What vocabulary would students need to use?

Closed
Curved
Intersect
Line segment
Open
Polygon
Sides
Straight
Vertex/Vertices
Language Demands

What would students say as they identify and describe polygons?

• This is a _____. It is/has _____.
• This is a _______ because __________.
• This shape has _____, _____, and ______.
• This is not a _____. It is/has __________.
• This is not a _____ because __________.
With a partner, study the list of instructional strategies you were given. Categorize them according to these purposes:

• Make math comprehensible
• Provide opportunities for talk
• Support talk
Identifying and Describing Polygons
Video Lesson Vignette

• Introducing Academic Language
• Introducing Polygons
• Exploring Polygons Independently
• Summarizing the Lesson
In what ways does the teacher make the math content comprehensible and support students in understanding math concepts?

What opportunities to talk about their mathematical thinking are students given?

What strategies does the teacher use to support students in talking about their mathematical thinking?

What evidence did you see from students that these strategies were effective?
Strategies to make math content comprehensible . . .

• Create vocabulary banks
• Use native language as a resource
• Make manipulative materials available
• Activate prior knowledge
• Provide visuals
• Pose problems in familiar contexts
• Demonstrate and model
• Use dramatization and gestures
• Modify teacher talk
• Connect symbols and words
Strategies that provide opportunities for talk . . .

• Ask questions that elicit explanations
• Consider language and math skills when grouping students
• Facilitate whole-group discussion
• Allow for small-group discussion
• Utilize partner talk
Strategies that provide support for talk.

- Use sentence frames
- Practice wait time
- Design and ask questions that target different proficiency levels
- Reduce stress level in the room
- Use prompts to support student responses
- Ask for choral responses from students
- Elicit nonverbal responses (thumbs up/down)
To think about . . .

• How did the ideas in this session connect to what I already know?

• What did I see, hear, or talk about that gave me something new to consider?

• What else do I want to know?
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link to slides/handouts:
http://mathsolutions.com/presentation