Teaching Mathematics to English Language Learners

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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 \textit{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
Demands of Teaching and Learning Mathematics
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. Tell what you know about each and how they fit in the following categories:

- Making math comprehensible
- Providing opportunities for math talk
- Supporting math 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?
Identifying & Describing Polygons

A Fourth-Grade Class

Christine Sphar, coauthor of
Supporting English Language Learners in Math Class, Grades 3–5

Math Solutions
In what ways does the teacher make the math content comprehensible and support students in understanding math concepts?

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Identifying and Describing Polygons

Video Lesson Vignette

• Introducing Academic Language
• Introducing Polygons
• Exploring Polygons Independently
• Summarizing the Lesson
How does Christine use the process standards of reasoning, problem solving, representation, and communication to introduce polygons?

What happens in Christine’s class when students make mistakes?

What different strategies did Christine use in this part of the lesson?
Introducing Polygons
How does Christine use the process standards of reasoning, problem solving, representation, and communication to introduce polygons?

What happens in Christine’s class when students make mistakes?

What different strategies did Christine use in this part of the lesson?
Rusty Bresser, Lecturer and Supervisor, Education Studies Program, UCSD.

Kathy Melanese, Distinguished Teacher in Residence, Education Studies, UCSD

Christine Sphar, English Language Development Coach, El Cajon Valley School District, CA
Questions?
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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