



Math Solutions®

FOUNDED BY MARILYN BURNS

Teaching Mathematics to English Language Learners

Re-imagining TESOL

Carolyn Felux and Jamie Cross

TESOL'S 2010 Annual Convention

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.

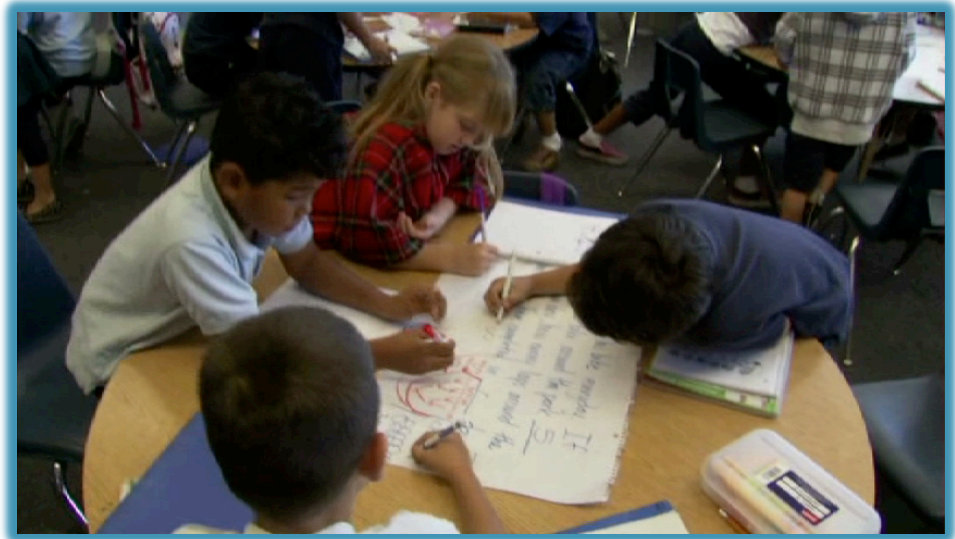
With a focus on supporting English language learners, in this session we will:

- 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:

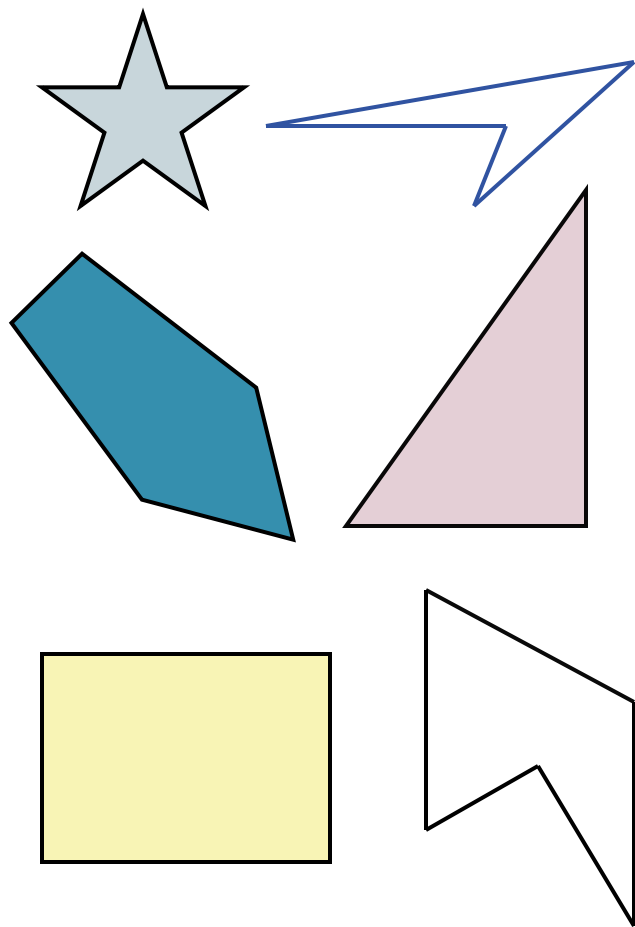
What language will students need to articulate their learning?

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

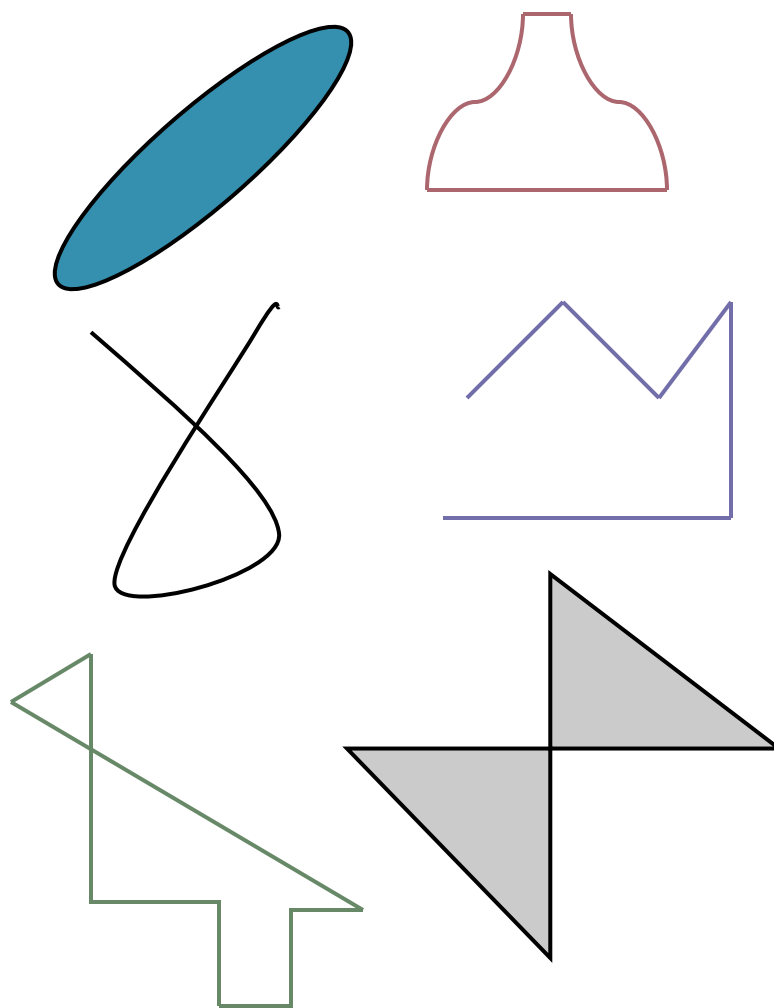
What is the key vocabulary?

.

Polygons

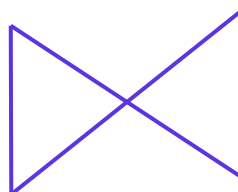
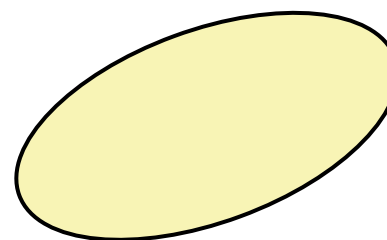
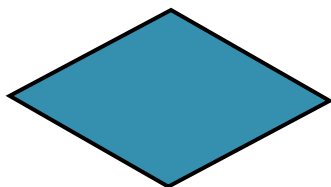
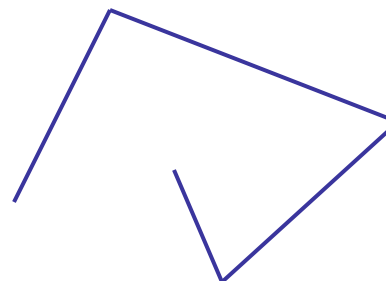
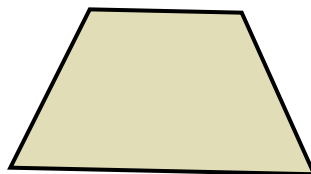
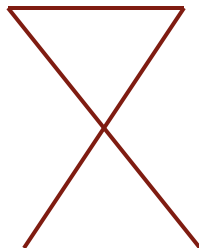


Not Polygons



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?



Math Solutions®

FOUNDED BY MARILYN BURNS

cfelux@mathsolutions.com

mathsolutions.com

800.868.9092

link to slides/handouts:

<http://mathsolutions.com/presentation>