

Teaching Math to English Language Learners

Marji Freeman

Math Solutions

<http://www.mathsolutions.com/CMCELL>

CMC South 50th Annual Fall Conference

November 6-7, 2009

Palm Springs, California

Teaching Math to English Language Learners

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.

Our Mission

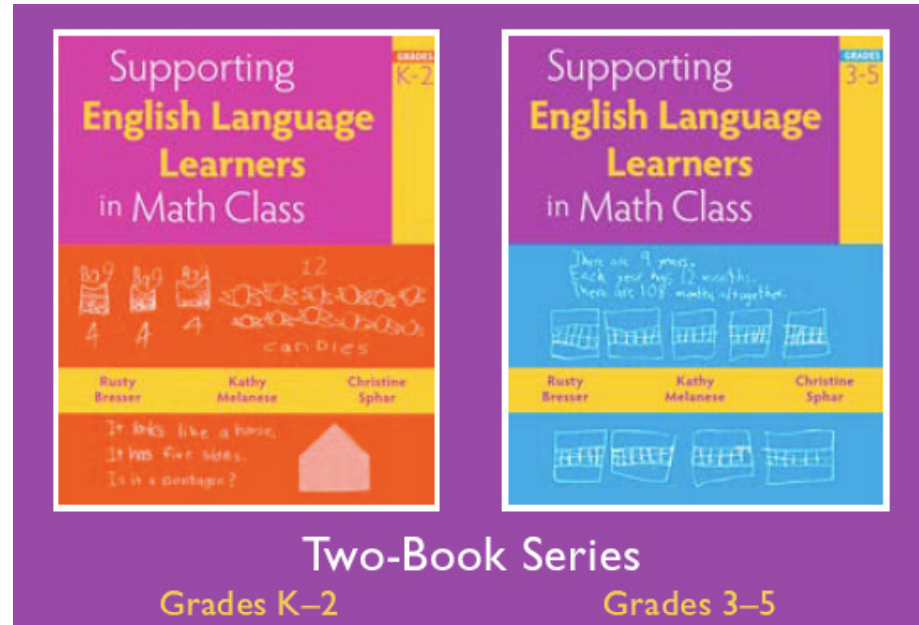
As a thriving organization responsive to a changing world, **Math Solutions** is dedicated to improving children's learning of mathematics by providing the highest quality professional development services products, and resources to educators.



Marilyn Burns, Founder

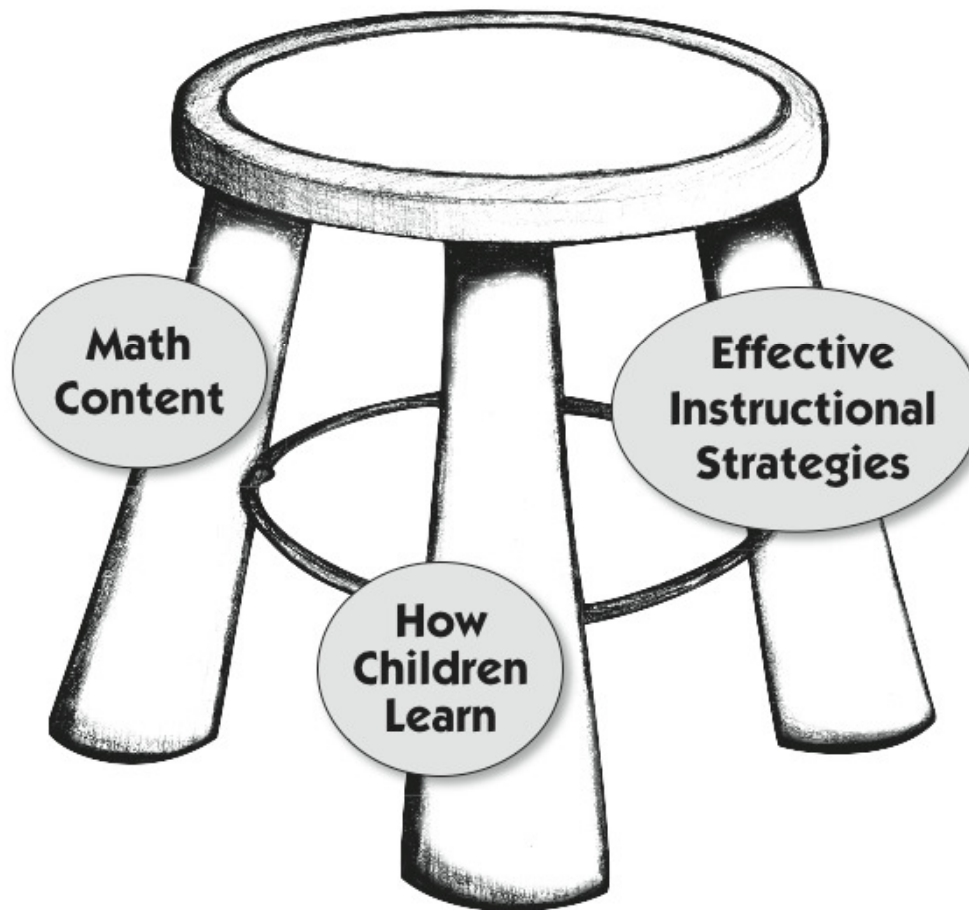
Supporting English Language Learners in Math Class

instructional resources



Rusty Bresser Kathy Melanese
Christine Spahr

Common Elements in all *Math Solutions*' professional development



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

- Consider the demands for teaching and learning mathematics
- Engage in and reflect on a professional learning experience
- Consider a variety of instructional strategies that support English Language Learners

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

NCTM 2000

*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



Professional Learning Experience

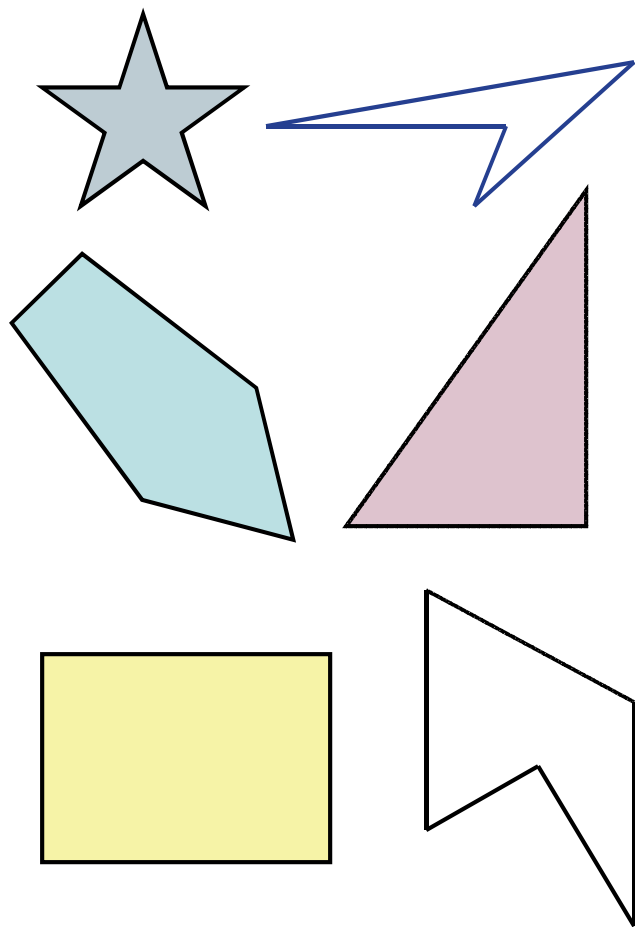
What we'll do:

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

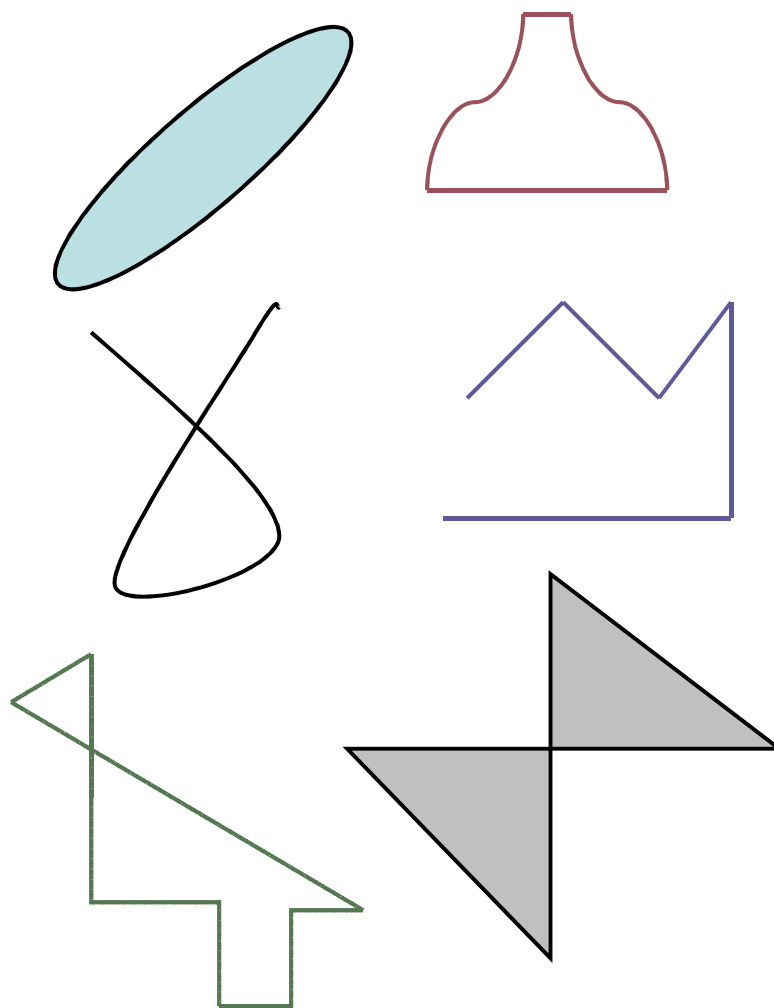
Math Goal:

Students will identify and describe the features of polygons and the features of figures that are not polygons.

Polygons

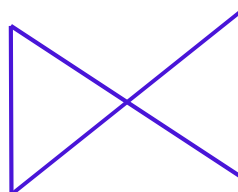
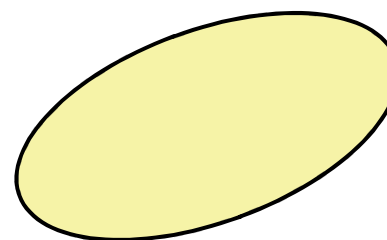
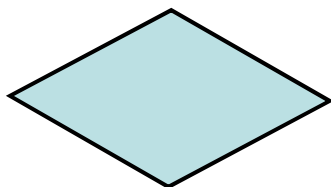
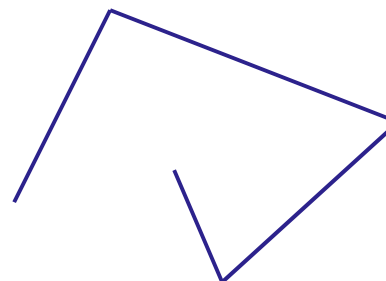
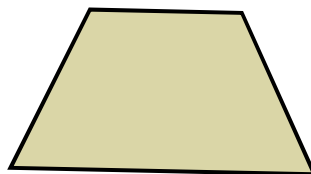
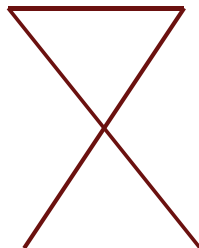


Not Polygons



Sorting Task

1. Sort the figures into two categories: *polygons* and *not polygons*.
2. Describe the figures as you sort them and give reasons for your decisions.
3. As you sort the figures, record the key vocabulary words and language you used as you identified and sorted the shapes.



Vocabulary and Language Goal

Closed

Curved

Intersect

Line segment

Open

Polygon

Sides

Straight

Vertex/Vertices

Identify and describe
polygons and figures that
are not polygons.

This shape has . . .

This is a . . . because . . .

This is not a . . . because . . .

Identifying and Describing Polygons

Video Lesson Vignette

- Introducing Academic Language
- Introducing Polygons
- Exploring Polygons Independently
- Summarizing the Lesson

Instructional strategies that:

- Make math comprehensible
- Provide opportunities for talk
- Support talk

Identifying & Describing Polygons

A Fourth-Grade Class

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



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?

Introducing Polygons



Reflection

What strategies have you added to
your list?

Observe and Reflect

- Independent Work
- Summarizing of the Lesson

Strategies that Support English Language Learners

- identify a math and a language goal
- use sentence frames
- create vocabulary banks
- use manipulative materials
- pose problems in familiar contexts
- elicit nonverbal responses
- Use wait time

Strategies Continued

- utilize partner talk
- ask for choral responses
- provide visuals
- demonstrate and model
- build the answer into the question
- design questions and prompts for different proficiency levels
- ask yes/no questions with beginning language learners.

Reflection

From “Equity for Language Learners,” NCTM Teaching Children Mathematics, October 2009:

1. What **role does language play** in learning mathematics?
2. List some **challenges** that ELLs face during math instruction.

Reflection continued

3. What are important points to remember when **modifying** a math lesson for ELLs.
4. How can teachers **differentiate** math instruction for ELLS with **varying levels of proficiency in English**?
5. What are the benefits of using **sentence frames** to teach mathematics?

When planning a lesson...

Consider the following:

1. What is the **math goal**?
2. What is the **language goal**?
3. What **vocabulary** needs to be taught explicitly?
4. What is the **purpose for language**: to describe, to categorize, to hypothesize, to sequence, to compare and contrast?

When planning a lesson continued

5. What **strategies** will you use?
6. How will you **differentiate** lesson for various language proficiencies?
7. Are opportunities for **discussion** built in?

Questions?





Math Solutions[®]

FOUNDED BY MARILYN BURNS



Making a Difference

Math Solutions
www.mathsolutions.com

<http://www.mathsolutions.com/CMCELL/>

Marji Freeman
Director of Professional Development
mfreeman@mathsolutions.com

