

Teaching Math to English Language Learners

ESL in the Content Areas

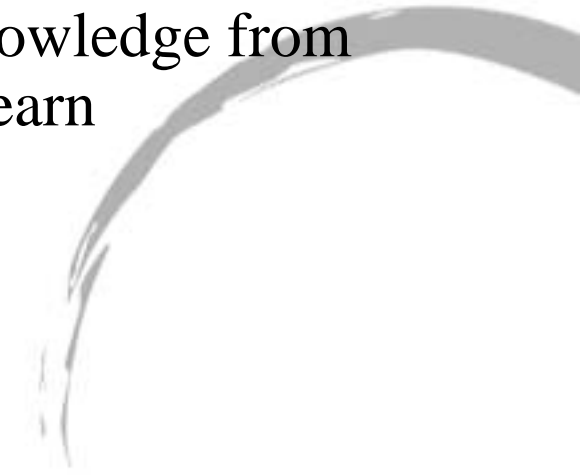


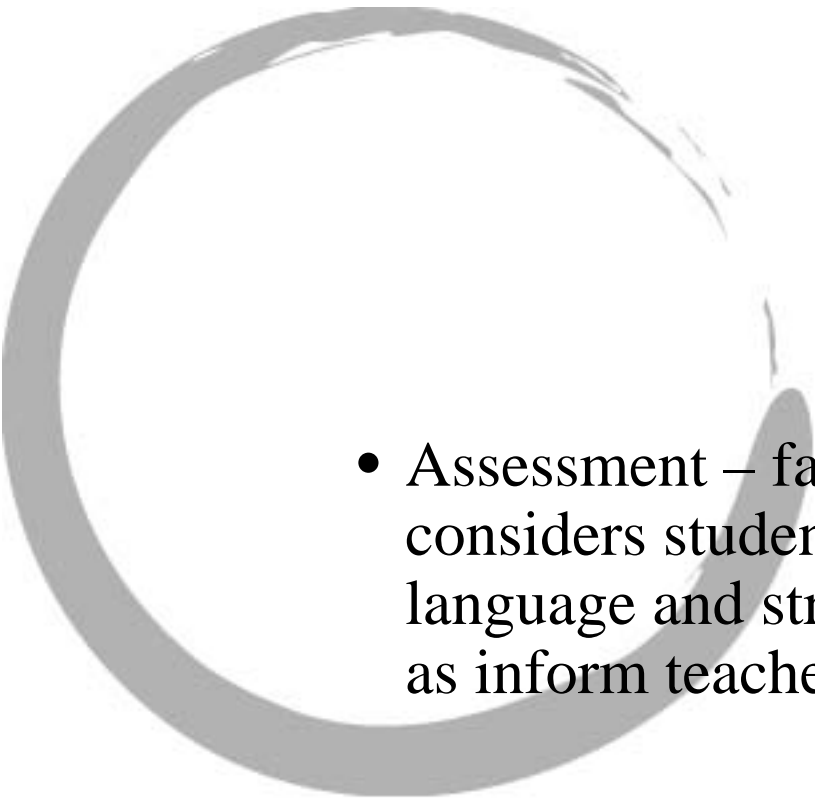
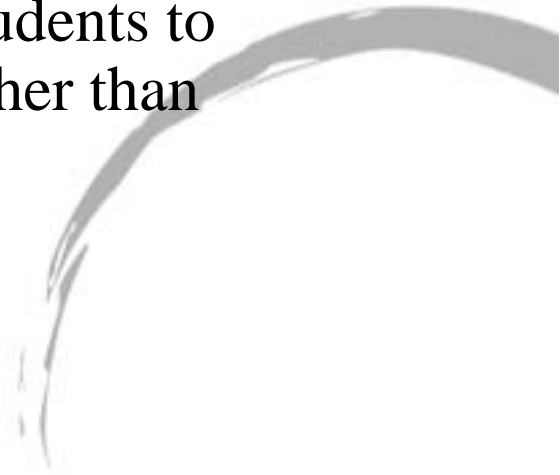
National Council of Teachers of Mathematics - Six Principles

- Equity
- Curriculum
- Teaching
- Learning
- Assessment
- Technology



Specific to ELLs

- Equity – high expectations and strong support for all students; inclusion
 - Teaching – challenging and supporting students to learn mathematics well
 - Learning – actively building new knowledge from experience and prior knowledge to learn mathematics with understanding
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- Assessment – fair and authentic assessment that considers students’ learning English as their second language and strategies that assess and teach as well as inform teachers
 - Curriculum – curricula that allows students to explore mathematics more deeply rather than rapidly

What's Difficult in Math for ELLs

- Vocabulary
- technical terms such as *denominator, quotient, coefficient*;
- everyday terms that are used specifically: *rational, column, table*;
- two or more mathematical concepts that form a different concept: *least common multiple* and *negative exponent*;
- the same mathematical operation that can be described with a variety of mathematic terms: *add, and, plus, sum, combine, increased by* – all represent addition

Syntax

- a concept that is made up of the relationship between two words: *greater than, less than, as much as, the same as*;
- complex structures: *Twenty is five times a certain number. What is that number? How much is one-half of 10?*
- the passive voice: *nine is divided by 3; thirty is represented by one-half of 60*;
- logical connectors: *then, that is, but, consequently, either*;
- understanding the process behind statements such as: *if 4 is equal to 2 plus 2, then 8 is equal to _____ plus _____*

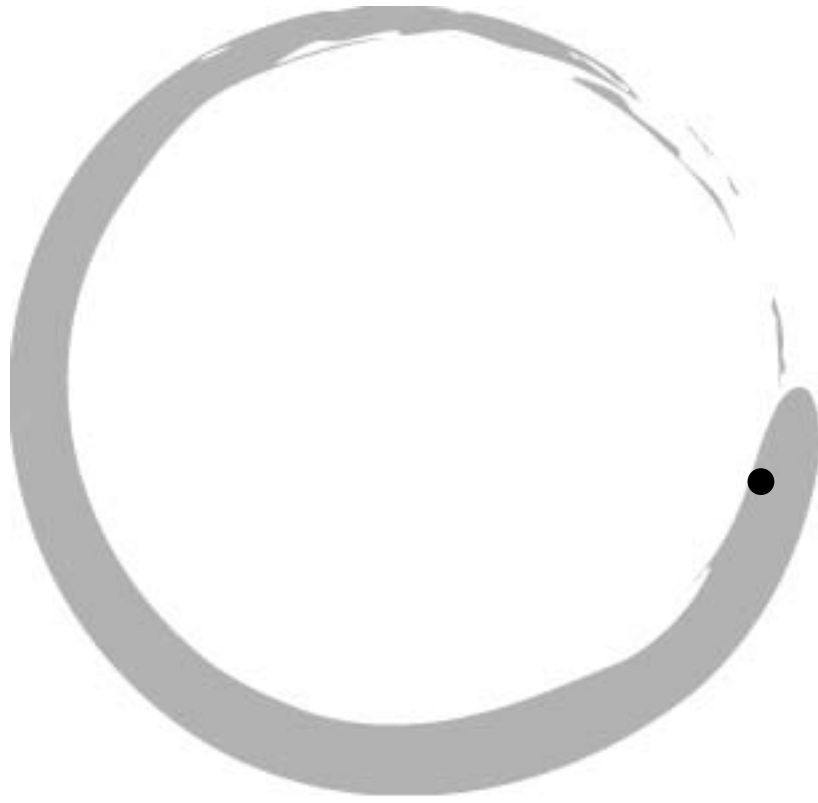
Semantics

- Making inferences from the natural language to the language of mathematics, for example, in this statement, *Five times a number is two more than ten times the number*, students must know that *a number* is the same quantity as *the number*.

However, in the problem, *the sum of two numbers is 77. If the first number is ten times the other, find the number* – the students need to know they are dealing with two numbers.

Discourse Features

- The tendency in textbooks to interrupt for the inclusion of formulae;
- the need to read passages multiple times and more slowly;
- charts and graphs are an integral part of the text, not supplemental;
- technical language has precise, codified meaning;
- students need explicit instruction on processing mathematical texts.



• THE END

