

Making the Mathematics Curriculum More Accessible to English Language Learners

Outcome: In this segment we will discuss techniques for making the Mathematics curriculum more accessible to English Language Learners.

Chinese readers, read from right to left. Obviously, this could cause a student difficulty in an American classroom. One Native American culture does not have a concept for line. One South American culture does not have a concept for such numbers as 4 and 5. Instead they have the numbers 1, 2, and many. The Hmong culture does not have a concept for fractions. These instances are just a few examples of how culture can interfere with the learning of mathematical concepts.

Research has shown that, the language skills needed for mathematics in grades K-3 are often two years ahead of grade level expectations. For example, if you were working on mathematical problems in the third grade, you would need a fifth grade reading ability to adequately comprehend the problems.

To understand the relationship of language and mathematics, it is necessary to understand the main components of language as it is used in the mathematics classroom. Vocabulary in the mathematics classroom not only includes specialized terms such as quotient, multiplication, and divisor, but also everyday terms that take on new meaning when used in a mathematical context such as even, table, product, and quarter. In addition to this are the homophones such as sum and some, and words that may be hard to distinguish for LEP students, such as angle and ankle.

Also problematic for English Language Learners are issues related to syntax. Sentence structure can cause difficulties for ELL students in two particular areas. One area relates to the lack of a one-to-one correspondence between mathematical symbols and the words they represent.

A second area of problems relating to syntax deals with the use of logical connectors or linking propositions. For example, terms such as if ... then, and but, that is, either, even though - require a high level of language skills. Research shows that understanding logical connectors is the one factor that differentiated those students who could successfully reason mathematically from those who could not.

There are a few teaching strategies and methods that address the areas of difficulty for English Language Learners and are proven to be effective.

- Stress understanding rather than memorization of computational procedures.
- Provide plentiful opportunities using manipulatives and concrete hands-on activities.
- Use cooperative learning and minimize individual seatwork.
- Provide opportunities for peer tutoring-preferably by another English Language Learner or bilingual student who understands the concepts.
- Use native language texts, materials, and resources as much as possible.
- Use limited, simplified instruction with more modeling and less teacher talk.
- Teach vocabulary in context rather than focusing on key words to develop understanding.

Reflection: Which of the ideas presented in this segment could you integrate into your classroom?