Working With Mainstreamed Students

THE LANGUAGE OF MATH, SCIENCE, AND SOCIAL STUDIES

This Bulletin examines the specific language features of math, science, and social studies and provides recommendations for helping K-12 English Language Learners (ELLs) and other at-risk students become more effective learners in these content areas.

MATH LANGUAGE

Mathematics helps students in their ability to think, reason, and solve problems. Since the current math curriculum is weighted heavily towards verbal reasoning, the language of math requires a strong language proficiency and is thus particularly challenging to second language learners.

Low frequency vocabulary words, contractions, and idioms are problematical. Here are examples:

Vocabulary

There are many different words to express the same operation:
add - plus, combine, and, sum, increased by;
subtract - decreased by, take away, less (than), minus, differ.

Everyday language has special meaning - equal, rational, irrational, column, table. Prepositions such as of and by are used uniquely.

Complex phrases contain difficult concepts: least common denominator, negative exponent, greater than, as many as, more than, the same as, etc.

Language Structures

Complex language structures signal math operations that are confusing:
Thirty is six times a certain number.
What is the number?
Thirty multiplied by five equals what?
Nine divided by three equals three;
Fifteen is divisible by 5.

Other Features

Some math symbols may have different interpretations. In Spanish-speaking countries, for example, the period is substituted by the comma to designate decimals.

Strong language knowledge about articles is necessary to understand expressions such as a number and the number.

Recommendations:
1. Preview and identify language features
Hands-on materials and activities such as role plays and simulations, lab experiments, and drawing pictures are important; oral discussion is a *must*, and should involve teacher-directed summaries and tape summaries and review of key words.

**SOCIAL STUDIES LANGUAGE**

To understand social studies, a student must have a high level of academic vocabulary and an increasingly sophisticated understanding of U.S. American cultural values and history. Teachers can help ELLs by:

1. Identifying and teaching core vocabulary/terminology in advance. This should include both teacher-identified and student-identified words.
2. Utilizing prior knowledge to make connections with new material. The limited experiences with U.S. American culture and history means that teachers need to connect the lessons with the students, *not vice versa*. This involves appreciating and tapping into the background experiences of each individual student.
3. Providing information about the content by introducing a lesson to clarify the context and a framework, web, or organization guide to give students an idea or plan to make sense of the new information.
4. Engaging students in cooperative learning to promote interaction through assigned roles with specific tasks. This will help students to simultaneously work individually and collaboratively to practice language use, engage in critical thinking, and negotiate meaning.
5. Emphasizing paraphrasing and summarizing through writing sentences that summarize the main points of a lesson.

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**SOURCE:**