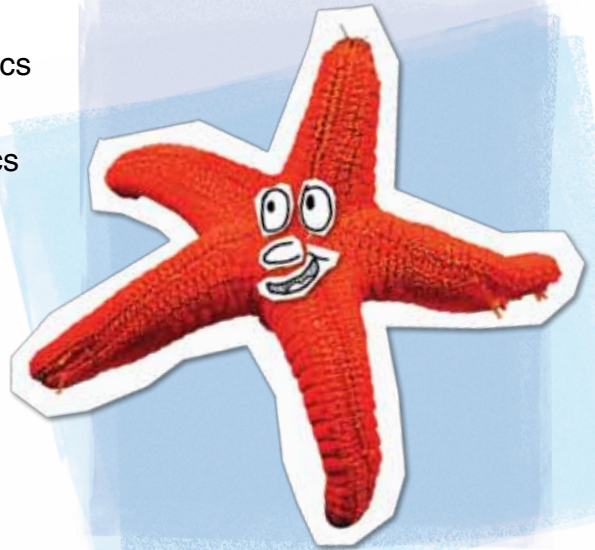


# English-Language Learners and Mathematics

## Best Practices for Effective Instruction

The National Council of Teachers of Mathematics (NCTM) emphasizes communication “as an essential part of mathematics and mathematics education” and that “English-Language Learners in particular need to have opportunities and be given encouragement and support for speaking, writing, reading and listening in mathematics classes.” Such efforts have the potential to help English-Language Learners overcome barriers that will facilitate “communicating to learn mathematics and learning to communicate mathematically” (NCTM, 2000).



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Research done on effective mathematics instruction for English-Language Learners (ELLs) has identified the following best practices. These can be categorized as cultural, instructional, and linguistic.

### Cultural Considerations

Be aware of how children’s home cultures and previous experiences can contribute to their mathematics learning (Gonzalez, et al., 1995; Tikunoff, 1985). English-Language Learners bring rich, although often different, experiences with them into the classroom. Consult with bilingual staff and other cultural brokers to find out what those experiences may be. Then use

your students’ prior knowledge to create contexts for meaningful instruction (Garrison & Mora, 1999). This is especially important when students are asked to solve word problems; in order to do so, they need to be able to picture and understand the situation. This is extremely difficult to do if their experiences do not allow them to visualize what the problem is about.

*McGraw-Hill My Math* support includes:

- **My World Example Spaces**—students create visuals of their personal experiences as they solve problems
- **Real-World Problem Solving Readers**—generate discussion to establish the problem-solving context

### Instructional Considerations

Teaching the concept before the math can help English-Language Learners conceptualize what they are learning without having to master the language first (Khisty & Viego, 1999). This can be through the use of pictures, video, manipulatives, objects, games, and graphic organizers (Krashen, 1981; Garrison & Mora, 1999).

In addition to using these kinesthetic and visual/spatial approaches to teaching concepts, it is important to encourage students to learn from each other. Solving problems with the aid of peers instead of individually supports the learning styles of many students who come from cultures in which collaborative learning is the norm rather than the exception.

McGraw-Hill My Math support includes:

- **Modeling the Math manipulative activity (TE)**—provides hands-on experience for students to conceptualize their understanding and articulate their thinking
- **My Foldable®**—encourages kinesthetic/visual/spatial approach to mathematics instruction
- **Differentiated Activities**—leveled for Beginning, Intermediate, and Advanced language proficiency

## Linguistic Considerations

If teachers structure classroom activities so that students have to speak and write about mathematics, there will be multiple opportunities to use the language of mathematics (Gee, 1992). This is best done if the teacher engages students in instructional conversations that include the use of questions and collaboration and group work (Khisty & Viego, 1999; Garrison & Mora, 1999). It is also important that while talking about

mathematics, students be encouraged to use the technical language associated with it once the concept is learned—for example, using *minus* instead of *take away* and including terms such as *quotient*, *dividend*, and *divisor*.

Other vocabulary that needs to be explicitly addressed are terms that can have both mathematical and common meanings. A table can be a piece of furniture, but in mathematics it often refers to a visual representation of data. *Round*, *square*, *foot*, and *problem* are other examples of such terms. As you are planning lessons, note these words and make sure that English-Language Learners understand that the common meaning is different from the technical.

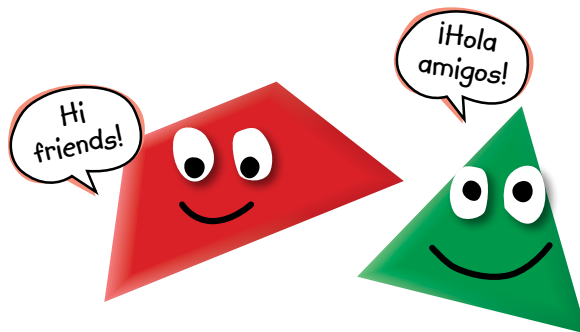
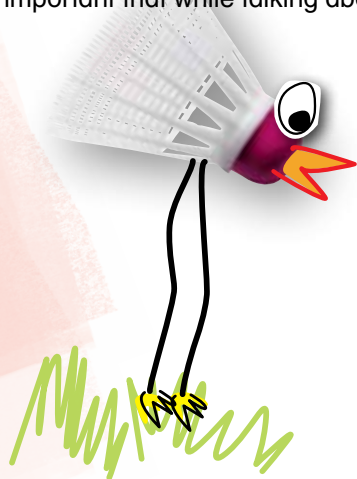
McGraw-Hill My Math support includes:

- **My Math Words and My Vocabulary Cards**—build understanding of mathematical terms
- **Digital Assets**—personal tutors, animations, and games for student interaction

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