Teaching Mathematics to Special Needs Students

In 1997, the Individuals with Disabilities Act mandated access to the general education curriculum for children with disabilities. In response, mathematics teachers and educators have developed creative and innovate ways to meet the mathematical needs of their diverse students. Students with attention deficits, memory problems, visual and auditory processing difficulties, motor disabilities, and information-processing deficits require special accommodations in the mathematics classroom in order to reach their potential in mathematics. English-language learners and students who need further mathematics instruction beyond their current grade level also need special modifications. Recognizing and understanding the learning challenges of our special needs students and identifying teaching strategies to facilitate their mathematics learning is the focus of this special issue of *Teaching Children Mathematics*. This focal subject reflects NCTM's recommendation in *Principles and Standards for School Mathematics* (2000) that "all students should have access to an excellent and equitable mathematics program that provides solid support for their learning and is responsive to their prior knowledge, intellectual strengths, and personal interests" (p. 13).

The articles presented in this focus issue represent a small sample of what mathematics teachers and educators are exploring in connection with teaching mathematics to special needs students. A purposeful mix of manuscripts covers a range of mathematical topics, special learning needs, and classroom scenarios. Central to all these articles is the notion of providing special needs students with a challenging mathematics education by tapping into their strengths and modifying instruction accordingly. The strategies, ideas, and perspectives presented are not limited to special education or inclusive classrooms. Rather, they can be incorporated into any mathematics classroom to enhance the mathematical learning and understanding of all students. By highlighting the strategies that support the learning of special needs students, we hope this focus issue will serve as an ongoing resource in your efforts to reach all students mathematically.

Teaching mathematics to special needs students requires instructional modifications and accommodations to make learning mathematics more accessible and rewarding for students. "Differentiation for Special Needs Learners" (page 158) describes differentiation strategies for students with learning difficulties in mathematics, such as visual organization displays, strategy sheets, and structured opportunities for movement. A second/third-grade lesson designed for students to discover alternative ways to add two-digit numbers illustrates these strategies while emphasizing NCTM's five Process Standards. "Building Responsibility for Learning in Students with Special Needs" (page 118) illustrates how special needs students need accommodations in mathematics classrooms and what can happen when modified instruction is not provided. The article explains four components of individualized instruction to help teachers reach more students and to help students become more responsible for their own learning.

Assessing what and how well students in general, and special needs students in particular, are learning in mathematics classrooms is a challenge. "On Tests, Small Changes Make a Big Difference" (page 134) illustrates how confusing assessment items can be for English-language learners and students who need to visualize the mathematics. Examples are provided of simple modifications in the format, wording, or presentation of test questions that allowed students to communicate their mathematics reasoning more effectively.

"Planning Strategies for Students with Special Needs: A Professional Development Activity" (page 146) shares a workshop activity in which general and special education teachers collaborate to strengthen their specific mathematics lessons. Using an accessibility planning process, teachers discuss the goals of the lessons, identify potential barriers and tasks based on students' strengths and weaknesses, brainstorm possible strategies, and plan accommodation activities to incorporate into their lessons.

Some of this month's regular departments also feature the special needs theme. In "Early Child-

hood Corner: Vive La Difference! Gifted Kindergartners and Mathematics" (page 155), a kindergarten teacher describes her work with differentiated instruction to meet the special needs of her accelerated mathematics learners. Recognizing the various levels of readiness in her classroom, she and her colleagues design advanced mathematical experiences that also attend to social and developmental needs. "Research, Reflection, Practice: The Mathematics Pathway for All Children" (page 127) describes the Mathematics/Science Integration program. In this program, special education students work cooperatively on problem-solving tasks that explore mathematics and science concepts in inclusive classrooms.

As elementary schools embrace the vision of inclusion, teachers are being called on to adapt their instructional methods to meet the special needs of a wide range of students. The articles presented in this focus issue showcase instructional and research endeavors that identify the challenges and achievements of teaching mathematics to students with special needs. We hope you will extend these ideas into your classrooms, chart and explore new directions with your students, and share your explorations with others. It is our hope that this focus issue will sustain a dialogue within the mathematics education community about making the vision of *Principles and Standards for School Mathematics* a reality for *all* students.

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Reference

National Council of Teachers of Mathematics (NCTM). *Principles and Standards for School Mathematics.* Reston, Va.: NCTM, 2000.

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For the Editorial Panel ▲