Setting the Record Straight

about changes in

Mathematics Education

Commonsense Facts to Clear the Air

Much of the current controversy surrounding school mathematics centers on the recommendations of the National Council of Teachers of Mathematics (NCTM) regarding improvements in mathematics curriculum, instruction, and assessment. Here are some facts.

Fact #1: School mathematics must meet the needs of a much greater proportion of students than it has in the past. NCTM advocates a mathematics curriculum that meets the needs of ALL students, without shortchanging any student.

Why? Because for much of history mathematics has been an effective "sorter" of human talent: few "got it," some mastered little more than arithmetic basics, and many were left far behind. Today, however, changes in the workplace, the demands of effective citizenship, and the mathematizing of so much of our lives requires that school mathematics empower all students. Meeting this goal of building mathematics programs that empower all students implies changes in curricular expectations for students as well as in instructional practices. Quality mathematics for all is an enriched mathematics, not a watered-down mathematics.

Fact #2: Technology is a way of life. When used appropriately, it can enhance learning as it has enhanced the quality of our lives. In light of the accessibility, speed, and accuracy of calculators, NCTM advocates a mathematics curriculum that balances an appropriate use of calculators with an emphasis on mental calculations with one- and two-digit numbers, estimation throughout the curriculum, and meaningful pencil-and-paper calculation.

Why? Because calculators and computers are unquestionably among the most powerful forces for change in school mathematics. When calculators can do multi-digit long division in a microsecond, graph complicated functions at the push of a button, and instantaneously calculate derivatives and integrals, serious questions arise about what is important in the mathematics curriculum and what it means to learn mathematics. More than ever, mathematics must include the mastery of concepts instead of mere memorization and the following of procedures. More than ever, school mathematics must include an understanding of how to use technology to arrive meaningfully at solutions to problems instead of endless attention to increasingly outdated computational tedium. And more than ever, the power of technology can help students develop stronger understandings of essential mathematical concepts.

Fact #3: The most important skill that business and industry demand is an ability to solve problems, particularly unfamiliar and nonroutine problems that arise daily. NCTM advocates mathematics teaching that emphasizes applications and problem solving.

Why? Because at its core, mathematics is a tool that helps us quantify the many scientific, economic, and social phenomena of the world and solve problems by applying mathematics. Mathematics arises from, and is learned through, the exploration and study of such everyday activities as buying and selling, comparing, measuring, visualizing, predicting, and interpreting. Mathematics is more about modeling and predicting average wait time at a fast-food establishment on the basis of the number of cash-register lines in operation than it is about simplifying complex polynomials. Mathematics is more about studying trajectories and predicting accurately where objects will land than it is about memorizing the quadratic formula. In short, mathematics must entail the study, understanding, and application of a set of concepts and skills commonly used by real people, in real settings, every day.

Brought to you by the 100,000 members of the National Council of Teachers of Mathematics in the interest of common sense, moving forward, and helping all children learn mathematics. This fact sheet on mathematics education has been approved by the NCTM Board of Directors.

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