

# Educators Battle Over Calculator Use: Both Sides Claim Casualties

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The philosophical war rages. On one side: the accused "kill and drillers," dedicated to times tables and long division, preaching the gospel of repetition and memorization. On the other side: alleged "fuzzy math" reformers preaching concept over content, insight over "right." Between them: the most visible symbol of the continuing conflict -- the classroom calculator.



Depending on one's perspective, the use of calculators at the elementary school level is seen as either the solution to or the cause of many of the problems affecting math education in this country. What's the truth? Even the experts disagree.

## IN THIS CORNER: THE CALCULATOR CHAMPIONS

Calculator proponents claim that calculators

- allow students to spend less time on tedious calculations and more time on understanding and solving problems.
- help students develop better number sense.
- allow students to study mathematical concepts they could not attempt if they had to perform the related calculations themselves.
- allow students who would normally be turned off to math because of frustration or boredom to increase their mathematical understanding.
- simplify tasks, while helping students determine the best methods for solving problems.
- make students more confident about their math abilities.

## AND IN THIS CORNER: THE CALCULATOR CRITICS

Critics say calculators

- produce students who can't perform basic tasks without a calculator.
- encourage students to randomly try a variety of mathematical computations without any real understanding of which is appropriate or why.
- prevent students from discovering and understanding underlying mathematical concepts.
- keep students from benefiting from one of the most important reasons for learning math -- to train and discipline the mind and to promote logical reasoning.
- inhibit students from seeing the inherent structure in mathematical relationships.
- give students a false sense of confidence about their math ability.

## THE BATTLE CRY IS SOUNDED

Perhaps the single most important reason for the increased use of calculators in U.S. classrooms was the widespread adoption of the 1991 National Council of Teachers of Mathematics (NCTM) Curriculum and Evaluation Standards, which recommended that "every teacher at every level promote the use of calculators to enhance mathematics instruction." Many math educators and boards of education enthusiastically endorsed the NCTM standards and actively promoted the use of classroom calculators from kindergarten through high school.

## THE WORD FROM THE TEACHERS IN THE TRENCHES

While few educators deny the usefulness of calculators at the high school level, some are now beginning to rethink their use in the lower grades. In California, for example, where the state Mathematics Framework calls it "a reasonable goal to make calculators available at all times for in-class activities," one local school district recently voted to ban the use of calculators in kindergarten through third grade and to limit their use in the fourth and fifth grades as well. Other educators agree with that position:

In a *Newsweek* editorial, California math teacher Diane Hunsaker writes, "Students who do not do long division, who quickly pull out their calculator to complete the answer, do not understand the underlying principle of division....Calculators prevent students from seeing the underlying structure and beauty in math." (3/11/97)

Tom Loveless, a Harvard University professor, is quoted in a *Washington Post* article as saying: "There are some elements of math -- particularly at the elementary level -- where some basic facts simply must be memorized. We have lots of teachers reporting that they're getting kids in third, fourth, and fifth grade who don't know their basic facts." (11/2/97)

Others disagree, however, claiming that calculators help younger students grasp the underlying principles of mathematics by allowing them to spend time on those principles rather than on the rote computations necessary to solve them. Patricia Campbell, a math professor at the University of Maryland, states in the same *Post* article "I would want a child to know how to add and subtract two and three digit numbers. But I don't want to spend class time adding and subtracting five and six digit numbers. I would rather spend class time doing other math."

Campbell's statement probably sums up the overriding issue for most classroom teachers -- what is the most productive use of valuable classroom time? And the answer to that question may lie in the reasons why we teach math today. Shay Cardell, a professor of Mathematics at Central Arizona College, offers these ten reasons for learning math.

1. To understand numbers and patterns found in nature.
2. To know when and how to use math tools.
3. To make fast and accurate predictions.
4. To grow and maintain mental power.
5. To understand invisible things.
6. To think logically and clearly when solving problems.
7. To operate systems using profound knowledge.
8. To recognize long-term causes and effects.
9. To check the reasonableness of answers.
10. To feel comfortable in a technological world.

It's up to individual teachers, of course, to find the right way to achieve those goals. And most teachers are striving to do just that. The battle, they say, is academic. In the classroom -- in the trenches -- there is no "either-or." There is simply a constant struggle for balance, for finding -- in each lesson -- the best way of ensuring the best results for each student.

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