

# **The Promotion of the Use of Calculators By The Current Math Education Reformers 1989 to 1996**

## **The NCTM Standards (1989)**

“(A)ppropriate calculators should be *available to all students at all times*;... For more complex calculations, the calculator *should be* used (column addition, long division)...

Contrary to the fears of many the availability of calculators and computer has expanded students’ capability of performing calculations. *There is no evidence to suggest that the availability of calculators make students dependent on them for simple calculations.* Students should be *able to decide* when they need to calculate and whether they require an exact or approximate answer. They should be able to select and use most appropriate tool.” [Curriculum & Evaluation Standards for School Mathematics, National Council of Teachers of Mathematics, Inc. Reston, VA, 1989, p.8] [Bold & italic are mine.]

## **The Newsweek Special Issue (1990)**

“Let us consider two machines, each capable of dividing 1,128 by 36. The first is a pocket calculator. You punch in the numbers, and in a tenth of a second or so the answer appears in a digital display, with an accuracy of, for all ordinary purposes, 100 percent.

The second is a seventh grader. You give him or her a pencil and a sheet of paper, write out the problem, and in 15 seconds, more or less, there is a somewhat better-than-even chance of getting back the correct answer.

As between them, the choice is obvious. *The calculator wins hands down*, leaving only the question of why the junior high schools of America are full of kids toiling over long division, an army of adolescents in an endless trudge, carrying digits from column to column,

.... *What exactly is the value of long division, or any of the rudimentary arithmetic skills, in the age of the computer and pocket calculator?*

‘What is it we expect students to learn?’ asks Thomas Romberg, (who was commissioned to produced the NCTM Standards), ‘If we’re preparing them to be Victorian clerks with quill pens and green eyeshades, we’re not doing our job. There isn’t anyone out there anymore *who makes his living doing long division.*” [From Newsweek, September © 1990 Newsweek, Inc. p.16. All rights reserved. Reprinted by permission.]

## **The K-3 Math Project (1992)**

“I have seen xxx (name omitted) nearly bite through her tongue to keep from telling a teacher, ‘These children (K-3) *should be* using a calculator to solve a column addition problem.’ Later, she explains her restraint. ‘That teacher is doing fine. *She has the calculators in the room. That is the crucial beginning.* She’ll learn to use them; she doesn’t need to be told. We have to be patient.’ The newsletter that xxx (the same person) edits will let this teacher know that she is a part of a national community of K-3 mathematics specialists. And xxx (the same person) *will discuss ways to use calculators in first grade classes in the next issue.*” [From: Garbage Pizza, Patchwork Quilts, and

Math Magic by Ohanian © 1992 by W. H. Freeman and Company, p.8. Used with permission.]

### **“It’s Time To Abandon Computational Algorithms” (1994)**

“It’s time to recognize that, for many students, real mathematical power, on the one hand, and facility with multidigit, pencil-and-paper computational algorithms, on the other, are mutually exclusive. In fact, *it’s time to acknowledge that continuing to teach these skills to our students is not only unnecessary, but counterproductive and downright dangerous.*” [Steve Leinwand, Education Week on the WEB, February 9, 1994]

### **Arithmetic Teacher (1994)**

“Although many people originally feared that ready access to calculators would harm students’ mathematical development, especially their ability to compute, much research suggests that calculator use in mathematics instruction enhances rather than inhibits students’ learning (e.g., see Hembree and Dessart [1992]). In fact, such fear seems inappropriate now that *the widespread availability of calculators has made traditional skill with paper-and-pencil computational algorithms, and therefore much of the current school mathematics curriculum, obsolete...*” [“Calculators and Computers: Tools for Mathematical Exploration and Empowerment,” Michael T. Battista, Diana V. Lambdin, Arithmetic Teacher,\* March 1994, p.412]

### **How Old Do You Want To Be? (1994)**

“The Curriculum and Evaluation Standards for School Mathematics (NCTM 1989) recommends the integration of technology into the classroom to *enhance skills and understanding*. Although much of the attention on technology has focused on the computer, the inexpensive and easily available calculator, especially one like the TI Explorer with special educational features, *may hold the greatest promise for positive change.*” [Kenneth P. Goldberg, Teaching Children Mathematics,\* November 1994, p. 184]

### **“Integrating Calculators: How Far Have We Come?” (1994)**

“Progress has been made; however, more progress is needed if we are to realize the *vision outlined in reform documents. The next generation needs textbook materials in which the calculator is regarded as an essential tool*, along with the many other tools we consider essential in a modern classroom. These materials must also address *the main obstacle to true integration of calculators – the traditional emphasis on paper-and-pencil computation.*” [Barbara J. Reys, Nancy L. Smith, Teaching Children Mathematics,\* December 1994, p. 207]

## “Promoting Calculator Use in Elementary Classrooms” (1995)

“It is important to keep classroom calculators *readily accessible* to the children. Just as counters, rulers, base-ten blocks, number lines, and many other items are stored on open shelves and available as needed, *calculators must also be kept in a visible location* among the mathematics materials. *Their physical proximity and availability help to promote their use.*”

“*It is important for students to use calculators in everyday situations.*” [Carola Drosdeck, Teaching Children Mathematics,\* January 1995, pp. 300f.]

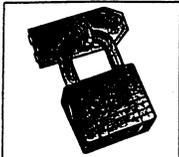
## “Sharing Teaching Ideas” (1996)

“*How does a mathematics teacher develop a strategy to use more technology in the classroom?* The answer is simple: *work with an English teacher in a year-long in-service program!* Jacquelyn Parker and I worked together in the Content Area Reading Program, ... Parker recommended that I use a graphic organizer. She also reminded me that as a teacher of algebra, geometry, and trigonometry, I had a built-in graphic organizer at my fingertips – *the graphing calculator.*” [“The Graphing Calculator and Division Of Fractions,” James Pelch, Jacquelyn Parker, The Mathematics Teacher,\* April 1996, p. 304]

## Promotion Of Calculator Through High School District

The following fliers were sent to 9 feeder school districts with about 16,000 students.

**CALCULATOR WORKSHOP**



UNLOCK THE  
MATHEMATICAL POWER  
OF YOUR STUDENTS

**See your students have more success in mathematics**

- DATE: May 5, 1994
- PLACE: Township High School  
Room T205
- TIME: 4:00 - 6:00 pm  
Stipend - \$16.00 per hour
- CALL: ( )  
(Reservations necessary)

PLEASE POST

**WORKSHOP  
on the  
MATHEMATICS  
STANDARDS**



**Have your Mathematics students be superstars**

**GO FOR THE GOLD**

- When: April 28, 1994
- Where: High School - Room T205
- Time: 4:00 - 6:00 pm (Stipend - \$16.00 per hour)
- Call: ( )  
(Reservations necessary)

\* Arithmetic Teacher, Teaching Children Mathematics, The Mathematics Teacher (HS) are official publications of the National Council of Teachers of Mathematics (NCTM).