

# Laying a Better Foundation to Teach Elementary School Math

WHAT DO ELEMENTARY SCHOOL teachers need to know to teach mathematics? Are teacher preparation programs delivering it? These are the key questions behind a new report by the National Council on Teacher Quality (NCTQ), *No Common Denominator: The Preparation of Elementary Teachers in Mathematics by America's Education Schools*.

Since there's no well-developed body of research on the mathematics preparation that aspiring elementary teachers should have, NCTQ spent two years working with its own mathematics advisory group, as well as with a variety of math educators, mathematicians, social science researchers, mathematics associations, and ministries of education in other nations, to develop a set of teacher-training standards. It then used those standards to evaluate elementary education programs at 77 higher education institutions.

Drawing primarily on an analysis of course syllabi and textbooks, NCTQ found that only 10 of the programs, or 13 percent, offered adequate content courses—and 5 of those 10 still could not be wholeheartedly endorsed because they fell short on math methods coursework. Only the University of

Georgia was noted for exemplary teacher preparation.

One of the principal findings, highlighted in the table below, was that most education schools fail to devote sufficient time to teaching the four areas of mathematics that are critical for elementary teachers to understand.

NCTQ also found that two-thirds of courses studied either use no mathematics textbook or use a textbook that is inadequate in one or more of the four critical areas. The report states that “the algebra portions of the textbooks are the weakest, with the majority of textbooks earning scores low enough to label them unacceptable for use in algebra instruction.” In addition, not one school offers an exit test that establishes whether prospective elementary teachers are prepared to teach mathematics.

To address these problems, NCTQ

recommends, among other things, that education schools require three courses that cover elementary and middle grades math content (including algebra, which is taught in the middle grades in many countries), as well as one math methods course that emphasizes numbers and operations. It also calls for the development of a textbook with both content and methods: “This ideal ‘combo-text’ would augment a core of solid mathematics content with discussion of a process for continuous improvement of instruction focused on student learning.”

The entire report, along with a sample mathematics test that NCTQ says every prospective and practicing elementary teacher should be able to complete without a calculator, can be found at [www.nctq.org/p/publications/reports.jsp](http://www.nctq.org/p/publications/reports.jsp).

**Deficiencies in Mathematics Instruction for Teachers**

Critical areas	Recommended distribution (hours)	Estimated mean of courses in sample (hours)
Numbers and operations	40	27
Algebra	30	4
Geometry and measurement	35	21
Data analysis and probability	10	9

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CREATED BY THE U.S. Census Bureau, Census in Schools is a program that incorporates census data, such as housing, economic, and geographic information, into free lesson plans and classroom activities. The lesson plans range from teaching students in grades K-2 how to read a map key, to teaching vocabulary such as reapportionment and gerrymandering to 11th and 12th graders.

The program's Web site features a colorful map (shown right) for elementary students that links to state information, including the capital, population data, and even the number of toy stores.



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