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National Mathematics Panel
11/06/2006
Schwab Residential Center
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Honorable members of the Panel:

My name is Charles Munger; I am an experimental physicist and a member of California's Curriculum Commission [1], which advises the California State Board of Education on the curriculum in our state's public schools. I am the present chair of Science; last year I was chair of Mathematics. But today I speak for myself and not as a delegate from that commission.

Four percent.

As you leave California, remember that one figure: 4 percent.

In 1997 California dissented from the advice of many national education organizations and wrote its own rigorous standards for what students should know and be able to do in mathematics at each grade level. In 1999 California completed its own guidelines---the *Mathematics Framework*---for how best to get students to master the mathematics in those standards. California had publishers design new and appropriate instructional programs. The first such program hit school districts in 2000. Norm-referenced tests are administered statewide to measure student achievement.

Surely this is one of the largest-scale, longest-duration experiments in mathematics instruction, ever. California has 10% of the school-age children in the United States.

After six years, what is the result?

Four percent. The fraction of students scoring at proficient or above on those state tests has risen 4 percent--*each year*, compounded now for six consecutive years: a 25% gain overall. That 4% annual figure is uniform across all grades K-8, for students in rural or in urban districts, across all ethnicities, across all economic classes, across all degrees of learning disabilities, is the same whether or not English is a second language, and is the same over all six years.

Something must be radically and profoundly right in California, about how students learn

mathematics, and what mathematics students can learn, to take an education system the scale of California's and to get this consistent, uniform progress. Standards and assessment; which are the critical skills and skill progressions needed to learn elementary mathematics and ultimately algebra and more advanced courses; the processes by which students of various abilities or backgrounds learn math---here in California we have made these things work.

Read our standards; read our *Framework* [2]. Examine the instructional materials unique to California and at work in our schools [3]. Confirm the test results [4] I have reported to you. California has something that will help the rest of the country. Please learn from it. Thank you.

Sincerely yours,

Charles T. Munger, Jr.
November 5, 2006.

All pertinent references are available through the official web site of the California Department of Education, www.cde.ca.gov. References to specific pages at that site:
[1] http://www.cde.ca.gov/be/cc/cd/index.asp describes the Curriculum Commission (the full name is the Curriculum Development and Supplemental Materials Commission).
[2] http://www.cde.ca.gov/be/st/
[3] On display at Learning Display Resource Centers throughout the state; for a list of addresses see http://www.cde.ca.gov/ci/cr/cf/lrdc.asp
[4] http://www.cde.ca.gov/ta/tg/sr/index.asp,
http://www.cde.ca.gov/ta/tg/sr/documents/yr06rel89summ.pdf