Putting Schools to the Test: 
California’s NAEP Scores and 
The National Testing Plan

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About This Report

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Testing has always been a major part of education. Whether it’s the weekly vocabulary test or the semester’s final exam, tests are an important tool that help teachers see what students have learned.

In addition to classroom-specific exams, standardized tests are widely used. These have long been a way for parents to compare their children to other children in the state or the nation, and for taxpayers to compare their neighborhood schools to schools elsewhere. But such comparisons often are complicated by questions about exactly what is being measured and what the results really mean.

Although these questions are far from settled, tests are at center stage in the policy debate about how to improve schools and learning. If accountability for results is the goal, then testing is a tool that can put the teeth into accountability. If performance standards are a key to improving learning, then testing can help tell us when the standards are being met. Once seen largely as a way to measure results, testing more and more is viewed as a way to help produce them. Testing is not just part of education reform – it is an instrument for driving reform.

Against this backdrop, it becomes more important than ever to understand test scores: what they mean, how they can be used (and misused) to shape policy, what their shortcomings are. For instance, everyone “knows” that test scores show that American students are doing poorly, and California students even more so. But is that what the National Assessment of Educational Progress (NAEP) tests really show? Is California’s ranking as dismal as it seems? And what promise does the Clinton Administration push for voluntary national math and reading tests hold?

On November 19, 1997, test score trends and future testing prospects were examined at a Sacramento seminar sponsored by the California Education Policy Seminar and the California State University Institute for Education Reform. A group of 46 California policy makers, administrators, educators and policy advocates gathered to hear Marshall S. Smith, Acting Deputy U.S. Secretary of Education, discuss existing tools for national monitoring of student achievement and the prospects for a new national testing system. Smith addressed three points:

♦ The National Assessment of Educational Progress – what the different tests are and what the scores show.
♦ California’s test scores – how the state ranks and the trends in student scores.
♦ The voluntary national tests proposal – how it would work and how it is different from other tests.

Marshall S. Smith is Acting Deputy Secretary of the U.S. Department of Education, serving as both the chief operating officer for the Department and as principal adviser to the Secretary on federal education policy and budget issues. Formerly Dean and professor at the Graduate School of Education at Stanford University, professor at the University of Wisconsin at Madison, and associate professor at the Harvard Graduate School of Education, Smith has both master’s and doctoral degrees in measurement and statistics from the Harvard Graduate School of Education. He is currently on leave from his position as professor at Stanford University.
Dr. Smith’s presentation covered trends in national and California test scores, as well as President Clinton’s proposal for a voluntary national test of reading in the fourth grade and math in the eighth grade. Throughout this report, comments made by individuals are summarized without quotation; all text contained herein should be regarded as paraphrasing and/or synthesizing what was actually said, and not as quotes attributable to either the presenter or any other participant.

National Test Score Trends

It is often reported that test scores show students are doing poorly in America. But when you look at the data, I think you find a different pattern than what has been reported and what is commonly accepted.

When we look at the test scores from the National Assessment of Educational Progress (NAEP) longitudinal test, we find that the scores are well above those when NAEP started in 1969. If you draw a curve of the scores during the past two-and-a-half decades, it makes a shallow U. Scores peaked around the early ‘70s, dropped until the ‘80s and then began to climb to the point that we are above where we started. This pattern is strongest for math and science achievement.

I think you can trace the rise in the scores to education reform efforts. Beginning in the early ‘80s, there began to be a big push for education reform – and I believe the scores reflect the difference those efforts made.

What is the National Assessment of Educational Progress?

The National Assessment of Educational Progress (NAEP), which began in 1969, is made up of three tests:

Long Term Trend: The long term trend reports on the performance of 9, 13, and 17 year olds in the areas of math, science, and reading, and on 4th, 8th, and 11th graders in writing. It can be used to look at results over time. The trend component has not changed substantially since its creation almost 30 years ago and has a heavy emphasis on basic skills.

Main: The main NAEP reports national results for 4th, 8th, and 12th graders in such topics as math, science, reading, writing, civics, geography, and the arts. It is designed to reflect current curriculum and teaching practices – presenting a tough challenge for students who may not have been exposed to the material covered. Main NAEP assessments include a large percentage of constructed-response questions.

State: The NAEP State Assessment, administered since 1990 allows states that volunteer to participate to compare their students with other states and with national and regional scores from the main assessment. In 1996, 47 jurisdictions participated in the state program.

None of the NAEP tests provides individual assessments or individual scores. The testing process and design is governed by the National Assessment Governing Board (www.nagb.org), an independent, bipartisan board that includes governors, state legislators, educators, business representatives, and the general public.
Another phenomenon that shows up in the scores is the rapid advancement of minorities between the early 1970s and late 1980s. Minority scores during this time were gaining at a faster rate than the majority scores in reading, math and science. And they were extraordinary gains – in many instances, 33 to 50 percent greater gains than the majority. These numbers strongly indicated that we were closing the gap between minority and majority scores. I think this reflects the big push on basic skills during those years and the targeted attention to inner cities. This is very important because it proves that if you put in a lot of effort, you can move test scores.

But then around 1990, the gap began to reopen. I think there are probably several reasons for this. One, the poverty rate began to increase in the early ‘80s, and everything we know tells us that poverty impacts education. Two, the big push on basics was over and we were switching our attention to problem solving and complex thinking. Three, the positive effect of moving from a segregated to a desegregated system, in the South especially, had pretty well run its course.

Perhaps the most important element was the switch away from basics, although what we know is pretty intuitive and anecdotal rather than definitive. When the push was on to emphasize basics, the poor children in the inner cities benefited the most because they were most in need of basic skills. Therefore, their scores climbed more rapidly than scores in the suburbs, where children may already have been better grounded in the basics. Then we switched to higher-level thinking skills. In the suburbs, these kinds of changes are always implemented more quickly – so then the scores from the suburbs began to climb more rapidly and the minority, inner city gains leveled off.

But overall, over the last 15 years, what we see are scores moving up, particularly in math and science. Let’s look at some score charts (at right): When you consider that a gain of 10 points is equal to about one grade level, the score gains are very impressive (although more for 9- and 17-year-olds than for 13-year-olds). Blacks and Hispanics in particular show huge gains – at age 17, a grade-and-a-half in math and two to two-and-a-half grades for science. That’s a big difference.

So to summarize, we see three things:

♦ The test score gains are real and significant.
♦ The subgroup breakout shows that minorities, for the most part, have made greater gains than whites.
♦ Gains occur in both math and science – two areas that many have targeted for improvement.

We also see a counterintuitive pattern in the numbers. The gains for the total population of students in both math and science are numbers that are smaller than each of the breakout gains (for instance, the math gain for 17-year-olds overall is 8, while it is 9, 14 and 15 for the respective subgroups). Intuitively, you would think that one of those numbers would have to be smaller to bring the total population score down. But remember that these are score gains over time, and during that time the subgroup population
proportions change greatly – so at different times, each group has a varying degree of impact on the overall score, as well as a varying pattern of gain, year to year. The point is that we need to disaggregate test score data in order to really understand the magnitude of effects.

This gives you a feel for the national data. Now, some commentators have argued that the nation’s test scores are declining. They simply haven’t looked at the data. Reading has been somewhat flat, but not math and science. The gains are there and they are significant gains.

California Test Score Trends

When we turn to the state tests and look at California scores, we see three things:
1) Overall, the scores are relatively very poor.
2) If you examine the scores closely and compare them with others, there are some positive trends. 3) No one group is alone in pulling performance down.

Let’s first look at the national and California comparison for 1996 math tests (at right). What this tells us is that very few students in the nation are deemed advanced or even proficient in math, but close to two-thirds are at least achieving at a basic level or above (62 percent in fourth grade and 61 percent in eighth grade).

But in California the situation is far worse. Barely half of eighth graders are found to be at or above basic level (51 percent) and even fewer fourth graders make the cut (46 percent). The only bright spot for California is that while the fourth grade is 13 points below the national average, by the eighth grade scores are only 8 points below the national average.

What Do the Ratings Mean?

Q: Who decides what is advanced, proficient or basic - and are these meaningful standards?

A: The NAEP uses four categories to describe student achievement. The whole universe of students is ranked as either at or above basic or below basic. Then there is a further breakout for at or above proficient and advanced. These performance standards are set by the National Assessment Governing Board in consultation with panels of teachers and other education specialists. Panel members think about the issues, examine sample items, and decide what they think students should know and be able to do. Then they establish cut points to distinguish among levels of achievement.

The NAEP tests are not measured against an external standard. And there are very few examples of student work that have been developed to correlate with the standards so that people can understand what the different levels mean. Thus, the standards don’t really do much to inform policy makers or teachers about what needs to be done in the classroom, but they do provide an index for understanding what students should know and be able to do.
So overall, California does poorly when compared with the rest of the nation. Let me elaborate with other data:

♦ California is not only scraping the bottom with its reading scores, but it also is falling faster than the national average. From 1992 to 1994, the national scores dipped three points and California’s score dropped five points. Relative to other states taking the test, California moved from third from the bottom in 1992 to next to the bottom in the 1994 rankings.

♦ No matter how the reading scores are broken out, the average California student scored in the bottom quintile in the nation for each subgroup in 1992 and 1994. That was true for whites, blacks, Hispanics and for all levels of parental income and education. This means that no one population or school setting is responsible for the problem in California – it instead indicates a problem with the overall quality of schools.

♦ On the eighth grade science test, California scores 10 points below the national average – the equivalent of roughly a whole grade.

♦ On the eighth grade math test, California is behind the national average by 8 points and is improving at a slower rate than the rest of the nation.

Despite these dismal comparisons, there are some positive signs of improvement. The charts at the right look at the differences between state scores and the national average for three large states with similar size populations and challenges — California, New York and Texas. What we see is that California does far worse compared to the national average than either New York or Texas, in both the fourth and eighth grade. But the interesting trend is that by eighth grade, California students have improved — still below the national average but closer to it than California’s fourth graders. That is not the case in Texas and New York where their students do more poorly relative to the national average by the eighth grade.

What does this mean? Well, one conclusion could be that schools in California don’t do a good job up until fourth grade, but then they are doing something that allows students to begin to catch up.

But a more general conclusion is that California’s fourth graders are weak, the eighth graders are a bit better – but none is terribly good. Moreover, an important policy perspective is that the subgroups act the same, so you know that your approach has to address the whole system and not just one subgroup or one component.
**California Scores: Why?**

If you ask why California’s scores are so low compared to the average, we don’t really know. But there probably are a lot of factors:

♦ Class size. When I came to California from Wisconsin in 1986, the difference was very evident. In Wisconsin, they had classes with 20 or 22 kids and they kept their schools small. In California, classes were 30, 35. My daughter came home from middle school after being there for a month and told me that she was known as Smith, M. Personal attention makes a difference in learning, and when classes and schools are too big, you see an impact.

♦ Financing. California’s schools are underfinanced in a serious way. There has been, of course, a huge argument about whether money counts. Well, money well spent counts a lot.

♦ Chaos. California has an incredibly chaotic environment. If you look at the past 17 or 18 years, there are gigantic swings, disappointments, lurches, and changes in policies. Reform after reform – with all this cacophony of change, teachers just close the door and do what they have always done. California is almost unique in its capacity to put ideology on its sleeve and call it education policy. In reading, for example – from whole language to phonics – the swings are huge. But we know that different children learn to read differently and that good teachers use everything they have to meet the child’s needs. Phonics is important, reading books is important. There’s no magic solution in teaching diverse students, and it’s hard to do it well. The problem with locking into one specific approach and telling teachers what they have to do is that you kill professionalism and creativity. Good teachers use lots of different strategies, depending on the needs of their students. Policies need to focus on high standards and a balanced approach to instruction.

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**The Impact of Non-English-Speaking Students**

Q: California’s students are 34 percent non-native speakers. NAEP lumps these students in with all the others once they have been in the school system for two years - but we know that it takes four to seven years for children to be proficient in English with native language instruction and even longer if they don’t get adequate help. Doesn’t this pull California’s scores down and make it unfair when we are compared to states with few non-English speakers? And why can’t NAEP break out these students separately?

A: In the test sample, there really aren’t enough students to break them out separately. And in the latest round of tests, NAEP has moved to a three-year standard as a proxy for when students know enough English to be tested and grouped with everyone else.

There is some effect on the overall test scores of a large percentage of LEP students in California. But at the same time, you have to recognize that all the groups in California, no matter how they are broken out, are in the bottom quintile for their group. Blacks and whites in California, for instance, you would expect to be mostly English speakers, and they are in the bottom rankings nationally for their groups.

So the performance problem doesn’t appear to be linked to language barriers because the problem exists across all groups - not just in the Hispanic breakout where you would expect to see the impact of non-native speakers.
Teacher expertise. The profile of the primary teacher in California has changed dramatically over the past 10 years. They tend to be younger and not have much experience – and with class downsizing, that isn’t going to change. The skill level and the preparation isn’t there. This contributes to low scores.

So California has problems. Even though there are some good trends, “good” is relative. The data are clear that California needs to work harder – you have big problems and your students are achieving at intolerably low levels.

Voluntary National Testing

The Clinton proposal is to test fourth graders in reading and eighth graders in math with voluntary national tests that will give individual scores. The purpose is not simply to have another test. We want to change the odds for kids – improve their chances for having higher quality teaching and greater learning. Moreover, this will be different from other tests.

But first, the background. Why did we decide to have these two national tests now? What was the motivation? On the one hand, we now have state standards, Goals 2000, systemic change – there’s been a lot of reform going on over the past 7 years. And there are new initiatives. At the U.S. Department of Education, there’s the Family Involvement Partnership for Learning to get parents involved in schools and there’s the America Reads Challenge to link college tutors with reading learners. Communities and states around the nation are mobilizing and learning, especially learning to read.

A lot is going on, but it’s scattered and the results are uneven. So during the time shortly after the 1996 election, the President and the Secretary looked at what we could do that might stimulate a more coherent and focused approach to reform - a local approach that would lead to clearer improvement and accountability. National tests at fourth and eighth grade were selected as a relatively low-cost, high-impact policy strategy. It’s a way to focus attention, stimulate discussion, and spark change.

Why fourth and eighth grade? Fourth grade reading is an end point in a process. In the U.S., schools generally stop teaching reading at fourth grade – by then students are reading to learn rather than learning to read. So the goal is to be an independent reader by fourth grade. We aren’t measuring the process but instead are measuring the outcome. For math, by eighth grade you want students to have sound basics and complex skills set up to prepare them to take the courses they need for college. So these are two transition points in education and they are good points to look at outcomes. Basic skills, key transition times.
**Test Design**

Let’s talk about the design of the tests. The tests will yield individual scores that can be used by parents, teachers and schools – but no individually identifiable data will be given to the federal government. Tests will be consistent with Standards for Educational and Psychological Testing, with inclusion criteria and appropriate accommodations required.

The tests themselves will be approximately 80 percent machine scorable items and 20 percent constructed responses. About half of the testing time will be spent on the non-machine scorable items. There will be up to 90 minutes of testing time, calibrated so that 90 to 95 percent of the children will have adequate time to finish.

**Innovations of the Tests**

So what makes these tests different? The tests have several innovative characteristics that will cause them to have tremendous impact.

♦ **Public and Independent.** The tests will be developed by an independent, bipartisan board — the National Assessment Governing Board (NAGB) — with extensive public proceedings and outreach. Under the guidance of NAGB, teachers, principals, business and community leaders, parents, and reading and math specialists will develop test items and specifications. Throughout

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**Putting Test Results to Work**

**Q:** How can states use the information from NAEP? For instance, can it guide California’s efforts to create standards?

**A:** This whole business of setting meaningful performance standards is very important and it’s very hard. We can see how difficult it is when we look at what has happened in the 46 states that have set standards in the past few years. When the Southern Regional Education Board (SREB) looked at some of those states and compared their fourth grade reading scores to the NAEP scores, there was a big disparity. In a few cases, state standards are clearly tougher. For instance, in New Hampshire the NAEP score was 36 percent but the state’s own tests showed students scoring only 29 percent.

But for the most part, states are inclined to have more lax standards than NAEP. For instance, Wisconsin showed 88 percent for its children while NAEP gave them a 35 percent. That reflects a big difference in the standard that children are being held to.

That’s why knowing the nature and content of the standards is important - and many of our content standards for curriculum are very vague. If the standard is to be an independent reader by fourth grade, that doesn’t tell us much unless we know what kind of books are read at that level, what inferences the children are expected to be able to draw, what kind of responsive essays they should be able to write, etc.

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**Proficiency in 4th Grade Reading: NAEP Assessments vs. States’ Own Assessments**

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- NAEP Standard
- State Standard
this process, NAGB will hold public hearings to gather comments on the tests.

- **Tied to External Standards.** There will be an explicit linkage to the results of NAEP and, for mathematics, the Third International Mathematics and Science Study (TIMSS) as well. This means there will be external standard(s) to measure the test results against — and we don’t have that for most other tests. With a clear picture of student performance, parents, teachers, administrators, and business and community members can better target students’ academic needs.

- **Public Release of the Tests.** Within two weeks after the tests are given in March, all of the test items, answers, and explanatory information will be widely and publicly distributed through the Internet and other avenues. In May of the same school year, teachers will receive individual students’ answers to every test item, along with explanatory information.

Before the end of the school year, teachers and parents will know how their students’ performance measures against high academic standards, and they will have the tools to help improve their performance. Teachers and parents will have a clear explanation of what the NAEP standards are and detailed examples of proficient performance based on those standards. Teachers and parents can sit down with an individual student and address his or her particular needs.

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**What Rich Supplemental Information Might Look Like**

Following the seminar, Dr. Smith offered an example of the supplemental information that will be provided with the national tests.

**Example Test Item**

Which of the following equations has the same solution as $6(x-4) = 10$?

- a) $6x - 4 = 10$
- b) $x - 4 = 4$
- c) $3x - 12 = 5$
- d) $3x - 6 = 5$

Answer: C

**Content Area: Algebra and Functions.** This content area includes algebra, elementary functions, trigonometry, and some topics in discrete mathematics. Proficiency in this content area requires both manipulative facility and conceptual understanding; it involves the ability to use algebra as a means of representation and to use algebraic skills and concepts as problem-solving tools.

**Examples of Student Work:** A student may solve for $x$ in the test item equation and may solve for $x$ in the possible answer equations until he or she finds a match.

Other students may notice which equations are equivalent or not, and immediately eliminate choice “a” since the distributive property makes this a different equation from the given equation. Students might also notice that choice “c” is equivalent to the given equation by multiplying it out to $6x - 24 = 10$.

**Work Needed to Achieve Different Levels of Proficiency:**

The work above will be illustrated according to different proficiency levels.

- **Basic:** This level denotes partial mastery of prerequisite knowledge and skills that are fundamental for proficient work at each grade.
- **Proficient:** This level represents solid academic performance for each grade assessed. These students have demonstrated competency over challenging subject matter, including knowledge, application of knowledge, and analytical skills. **Advanced:** This level signifies superior performance.

**Additional Items:** More complex items that require the procedural knowledge required in the test item above.
Teachers can evaluate their current teaching materials and instructional methods and make plans to help their students during the same school year. School principals and teachers can review the test results of their students to evaluate the effectiveness of their instructional programs, to plan their summer professional development, and to mobilize teachers, parents, and the community to join in activities to improve performance.

♦ **Rich supplemental information.** Through the Internet and other means, parents and teachers will receive rich supplemental information — a clear explanation of the standards and content areas and examples of student work, as well as the work needed to meet different levels of performance. Teachers will have access to instructional strategies, research-based curricula materials, and a sample test a year before the first administration of the tests. Through a website, parents and teachers will be able to request technical assistance, join parent and teacher networks, access exemplary practices to teach demanding content, and view lists of recommended reading books.

♦ **Helping Teachers Teach Demanding Content.** Each year the tests are offered, the content areas will remain the same, but the items will be different. The tests are not designed to encourage teachers to have students memorize items or master “tricks” of testing. By keeping the content areas consistent from year to year and with new items each year, the tests will encourage teachers to teach students demanding content.

♦ **National Focus.** The President and others will talk about the tests every week for the next two years. This national focus will help mobilize local communities to improve education. Business and community organizations can form partnerships with schools, and community members can participate in education campaigns, such as the America Reads Challenge and the Department of Education’s Math Initiative.

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**Answering Critics of the Voluntary National Tests**

**Q:** With the politics of the issues surrounding the voluntary national test proposal - opposition from the right because of fear of a federal takeover of education and opposition from the left because of discrimination concerns - how do you expect it to become a reality?

**A:** I think the line of argument I would use is that we have tolerated different standards and poor results for years. For 30 years, we’ve conducted tests. We’ve replicated studies over and over and we know that things are not going well. And we’ve continued to tolerate poor performance.

I would argue that here we will have standards - crystal clear standards on two of the most important basic skills. And once those standards are there, the opportunities will fall in place. The tests will reinforce high standards, not prescribe a specific curriculum.

How do you get schools to stop doing the wrong thing? You have to put crystal clear standards in front of everyone’s face, every day, over and over. If the President is talking about the results, along with the governors, and the mayors, and the school superintendents - then you change the nature of the conversation about what schools are doing wrong and what they should be doing instead.

These tests will allow people to make the case that we are failing our kids - and make that case in a very public and informed way. Then maybe we will begin to see change.
The Debate

The national test proposal has run into opposition from both sides of the political spectrum. Some conservatives fear that we are turning the schools over to the national government and losing local control. And many home schoolers are worried that they will be forced to take the test. This has generated huge opposition.

On the other side, some liberals are worried that low test results will stigmatize students, giving them yet another label without yielding any more information or any improvement. Especially if these tests are used to track students or retain students, some liberals fear that they will be misused, no matter what assurances are made up front.

Still others on both sides of the political spectrum believe that national testing is not an appropriate federal role.

The result for a while was a stalemate that stalled the appropriations bill for the Department of Education and a couple of other departments. Finally, the Senate proposed that the National Assessment Governing Board (NAGB), an independent, bipartisan board, oversee the development of the voluntary national tests, and the House proposed that the National Academy of Sciences (NAS) evaluate the tests. A compromise along these lines was worked out in the 1998 appropriations bill. It includes:

♦ Giving NAGB the authority to develop the voluntary national tests in reading and mathematics.

♦ Delaying the test for a year. The original proposal was to start in 1999; now the spring of 2000 is the target.

♦ Having NAS study the tests as they are developed and review whether any off-the-shelf products could be used instead.

My prediction for next year? The President really wants this—and I would guess that he will get it. There will be further debate and adjustments, but I expect that there will be voluntary national tests in 2000.

Conclusion

Whether it’s looking at test score trends or creating a new national testing system, the goal is to find data that will help us improve learning. Regardless of some positive trends, there is a general consensus that our children are not doing as well as they could.

Do Students Take Tests Seriously?

Q: Isn’t there a problem with testing data because you can’t be certain the students are trying their best? And how reliable is the data on parental income and education level?

A: It is true that when there are stakes attached, kids work harder. And test administrators try to create a feeling of importance by telling the students the tests are valuable and by sending notes home to parents. It’s been looked at and the data says there are effects from some students of not taking the test seriously—especially secondary students—but it is mild and doesn’t greatly distort results.

There are problems, too, with the breakouts for income and parental education level. In NAEP, these data are self reported by students. And sometimes, especially in the lower grades, the students have no idea what their parents make or whether they went to college. So they just guess. It’s very hard to get really reliable data for these factors from young students.
or as we would like them to. And there is a general consensus that education needs to change – but there is no
consensus on what that change should be.

One thing we know about reform – it takes a long time and requires focus, focus, focus. You have to decide what you
are going to do and then just stay with it. Over time, you can make it happen through sheer will power. That’s what
real change and the standards movement are all about.

Testing can tell us what is happening, and sometimes help us figure out why. But just as importantly, it can stimulate
discussion, create standards, raise the bar for achievement – and in doing so, help stimulate and drive reform.
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**Seminar Participants**

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