

PREPARED REMARKS
for
ASSISTANT SECRETARY OF EDUCATION TOM LUCE
before the
SENATE SUBCOMMITTEE ON EDUCATION
AND EARLY CHILDHOOD DEVELOPMENT
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Good morning. Thank you for inviting me here today. I want to begin by thanking Chairman Alexander and the Members of the Subcommittee for your leadership in recognizing the growing challenge to American competitiveness in the global economy of the 21st century, and for your efforts to drive home the importance of this issue for both Congress and the American people.

If you think back over the past century, the world has made truly astounding progress in science, technology, engineering, and mathematics. And in virtually every field—from medicine, communications, transportation, agriculture, energy, and computers—American innovation has led the way. More than any country on earth, our economic system rewards the ambition, imagination, and hard work that generate new ideas and new inventions.

But another key to innovation is education, and I don't think it's a coincidence that the world leader in technology, with just 6 percent of the world's population, continues to graduate more than one-fifth of the world's doctorates in science and engineering. Or that 38 of the world's 50 leading research institutions are in the United States.

AS WORLD CATCHES UP, U.S. RISKS FALLING BEHIND

At the same time, there is no doubt that the world is catching up. The spread of political freedom across the globe with the end of the Cold War, combined with the communications revolution brought by the Internet, have quickened the pace of innovation and dramatically increased global economic competition. As Commerce Secretary Carlos Gutierrez has said to me, "We've won the Cold War. Capitalism prevailed, and we have three billion more competitors. Now we just need to run faster!"

Increased global competition benefits both the United States and the world. But it does present new challenges. Evidence of these new challenges is not hard to find. In 2005, a majority of the top 10 recipients of patents from the U.S. Patent and Trademark Office were foreign-owned companies. Over the past 15 years we have gone from a leading exporter of high-tech products to a net importer of those products. In addition, America's share of the world's science and engineering doctorates is expected to fall to 15 percent by 2010.

Moving further down the educational pipeline into our elementary and secondary schools, the U.S. also appears to be losing ground. Even though the 1983 *Nation At Risk* report recommended a minimum of three years of math and three years of science for all high school students, today just 22 States and the District of Columbia require at least this much math and science to graduate from high school. And there are plenty of data suggesting that we are paying a high price for this delay in putting a stronger emphasis on math and science in our schools.

Nearly half of our 17-year-olds do not score at the Basic level on the National Assessment of Educational Progress—the minimum level of math skills required to apply for a production associate’s job at a modern automobile plant. American 15-year-olds ranked 24th out of 29 developed nations in mathematics literacy and problem-solving on the most recent Program for International Student Assessment test. And just 7 percent of America’s 4th- and 8th-graders reached the Advanced level on the 2003 Trends in International Math and Science Study (TIMSS). By comparison, 38 percent of Singapore’s 4th-graders and 44 percent of its 8th-graders scored at the Advanced level on TIMSS. Our students are not just failing to keep up with their international peers; they also are not getting the preparation they need to succeed in the workforce or in our colleges and universities. Less than half of our high school graduates are ready for college-level math and science.

These data make a strong case that if we want to maintain our competitive edge in the global economy, we need to take action now. As the U.S. Chamber of Commerce recently noted, in its State of American Business report describing the challenge of remaining competitive in a global economy, “These are not academic questions for think tank futurists in ivory towers. They are ‘here and now’ questions that demand serious attention this year.”

AMERICAN COMPETITIVENESS INITIATIVE

I believe the Chamber, the Business Roundtable, the National Association of Manufacturers, and others in the business community have got it exactly right. We need to improve math and science education right now, this year, so that in the future, all students have the skills they need to be successful in higher education and the workplace. And we need to ensure that all students have the skills they need to enter the pipeline of future scientists, engineers, and mathematicians. This is why President Bush has proposed his American Competitiveness Initiative (ACI), which includes \$380 million in new funding to improve the quality of math and science education in our elementary and secondary schools, bringing the total the Department spends on math-science to almost \$1 billion.

The ACI would fund several activities designed to strengthen math and science education from kindergarten through grade 12. The Math Now for Elementary School Students initiative would provide \$125 million in competitive awards to implement proven practices in math instruction that focus on preparing students in elementary school for more rigorous courses in middle and high school. In particular, our proposal emphasizes the importance of teaching and learning algebraic concepts in elementary school, so that students have the foundation they need to take and pass Algebra. Algebra is a true “gateway” course for students going into postsecondary education, and ultimately the workforce, as demonstrated by Department data showing that 83 percent of students who took Algebra and geometry went to college within two years of high school graduation, while only 36 percent of students who did not take these critical math courses enrolled in postsecondary education.

A companion proposal, Math Now for Middle School Students, would focus \$125 million on identifying and implementing research-based interventions for middle school students who have fallen behind in mathematics. This competitive grant initiative is similar to the Striving Readers program, and reflects the President's determination that struggling students receive the extra help they need to succeed in math.

Both Math Now proposals would be informed by the work of the National Math Panel, which Secretary Spellings will move quickly to create this year. The Panel will work to identify the essential principles, practices, and components of effective mathematics instruction, and its recommendations will be a key consideration in making awards under the Math Now proposals. In addition, our 2007 request includes \$10 million to help disseminate the Panel's findings and put its recommendations to work in K-12 classrooms nationwide.

ADVANCED PLACEMENT

At the high school level, the key ACI proposal—and one that is shared by the PACE-Education Act—is \$90 million in new funding to expand teacher training under the Advanced Placement Incentive program, with an emphasis on AP instruction in math, science, and critical foreign languages. In combination with State and private matching funds, the proposal would train 70,000 teachers over the next five years to teach math, science, and critical foreign languages in AP and International Baccalaureate (IB) programs. New awards would be targeted to schools with high concentrations of low-income students that otherwise typically do not offer

AP or IB courses, helping these schools to train the next generation for the global economy of the 21st century.

The potential impact of expanded AP and IB offerings is demonstrated by a College Board study of students whose scores on the Preliminary SAT (PSAT) suggest they have the potential of earning a 3, 4, or 5, which is generally considered a “passing score,” on an AP exam if they had the opportunity to take one. These data suggest that the number of students in Tennessee who would be likely to pass AP tests in subjects like Calculus, Chemistry, Physics, and Biology is 5 to 10 times greater than the number of students currently achieving passing grades in these subjects. This is why, for example, the College Board estimates that in 2004 there were nearly 500,000 high school students whose PSAT scores indicated that they were ready for AP Calculus but who did not take the course for whatever reason.

This is strong evidence that the President’s AP proposal could help significantly increase the number and percentage of high school graduates who not only are prepared for college-level math and science, but also have already passed college-level exams in high school. Our long-term goal is to increase the number of students taking AP-IB exams in math, science, and critical foreign languages from 380,000 today to 1.5 million in 2012, and to triple the number of students passing these tests to 700,000 by 2012.

Another ACI proposal that would help strengthen math and science education in our high schools is the request for \$25 million to create an Adjunct Teacher Corps. This initiative would encourage experienced professionals with subject-matter expertise, particularly in math and

science, to teach in secondary schools through such arrangements as part-time instruction, teaching while on leave from their regular jobs, or providing instruction online. There is no question that there is tremendous demand from schools for the kind of expertise that could be made immediately available through the Adjunct Teacher Corps. Department data show, for example, that nearly two-thirds of all school districts report that recruiting qualified science teachers is a significant challenge, and over 90 percent of districts with high percentages of minority students reported difficulty in attracting highly qualified applicants in math and science.

NEED TO SPEND BETTER, NOT MORE

I know there has been some concern expressed that we need to invest more in improving math and science education, and in filling the pipeline of teachers and researchers in science, technology, engineering, and mathematics. I also know that the PACE-Education Act proposes a wide range of new programs designed for this purpose.

As you heard from Secretary Spellings, we believe that the combination of existing programs and the new resources provided by the American Competitiveness Initiative are sufficient to meet our national needs. The resources are there.

That's not to say, however, that we couldn't spend those resources better. According to a GAO report, 13 different government agencies are spending about \$2.8 billion on 207 different programs for math and science education, so we should look closely at the effectiveness of all of the critical investments for this purpose.

This is why the President is proposing \$5 million for an Evaluation of Mathematics and Science Programs that would build on the work of the Academic Competitiveness Council already created by the Deficit Reduction Act of 2005. The additional funding is needed to bring a more rigorous approach to assessing Federal elementary and secondary math and science programs, and, when appropriate, to permit examination of the extent to which these programs reflect the core accountability principles of No Child Left Behind (NCLB).

NCLB SUPPORTS IMPROVED MATH AND SCIENCE INSTRUCTION

It is important to recognize that our No Child Left Behind (NCLB) reforms have already been working to improve both teacher quality and instruction in math and science. For example, the implementation of reading and math assessments, beginning this year, for all students in grades 3-8 will for the first time ensure that parents, teachers, and principals know how well our schools and students are performing in math each year. And in two years, States will put in place science assessments as well.

We also are making considerable progress under NCLB in addressing the issue of teacher quality. The law requires all teachers in core subjects to be highly qualified by the end of the current school year and, while we know that not every State and district will hit that mark this spring, we believe the vast majority will be very close, and we are working with them to ensure that they will reach this goal as soon as possible.

In addition, States are moving to ensure that, in accordance with NCLB, minority and low-income students are not taught by inexperienced, unqualified, or out-of-field teachers at higher rates than other children. This is absolutely critical for improving instruction in fields like math and science, which often are taught by out-of-field teachers in urban and rural areas alike. For example, an analysis by the Education Trust-West found that 44 percent of math classes in California's high-poverty high schools are taught by teachers without a certification in that field. The story is even worse in California's high-poverty middle-schools, where more than 90 percent of math classes are taught by a teacher without a major or minor in mathematics.

The President's 2007 budget includes \$2.9 billion to help States meet NCLB teacher quality requirements, and school districts also are required to use 5 percent of their Title I allocations, or about \$624 million in fiscal year 2007, for professional development intended to ensure that all teachers are highly qualified. In addition, the Teacher Incentive Fund, funded for the first time in 2006, will encourage States and districts to provide financial incentives to teachers who help improve achievement in our highest-poverty schools.

Congress also recently acted in approving the Deficit Reduction Act of 2005 to provide critical incentives for postsecondary students to study math and science, and for qualified graduates to teach those subjects in our public schools. For example, this fall the new SMART Grants program will begin providing additional financial support to college students majoring in science, technology, engineering, and mathematics. And Congress made permanent a provision providing up to \$17,500 in loan forgiveness for highly qualified math and science teachers serving low-income communities.

CONCLUSION

In conclusion, while we are making good progress through the broad tools of No Child Left Behind, it is clear that we need to jumpstart improvement in math and science education through the American Competitiveness Initiative, just as the President's Reading First initiative four years ago helped spur more rigorous reading instruction. The ACI represents a comprehensive, measured approach to improving math and science education in our public schools and building a competitive workforce for our 21st century economy. It would draw on proven instructional methods to prepare elementary school students for more rigorous courses in middle and high school, help students who have fallen behind in middle school to catch up, raise expectations for high school students to take and pass challenging AP and IB courses, and streamline Federal math and science education programs and align them with NCLB accountability principles.

Finally, let me again express my appreciation for the leadership provided by the Chairman and other Members of the Subcommittee on the critical issue of improving math and science education. The Members of this Subcommittee obviously "get it" when it comes to the importance of math and science to our future competitiveness and prosperity, and I hope that your efforts will help change our culture so that all Americans, and especially our young people, "get it" as well.

Thank you, and I will be happy to answer any questions.