

There are far too many of my colleagues who have had this experience—who have watched as news of school violence spread across our country. This week's tragedy was in Virginia, but it is obviously of nationwide concern.

Thirty-two lives, most of them young and from the best and brightest in our society, ended Monday by savage violence. Last year, one lost life in Bailey; thirteen lives lost in 1999 at Columbine in Littleton; and there are others lost around this Nation, and around the world, in similar tragedies: Dawson College in Montréal, Gutenberg School in Erfurt, Germany.

These are wounds, scars, that will not be removed, and for those who bear the worst of this burden my wife and I offer all our compassion, our sympathy and our prayers.

Our Nation continues to grieve with the families and friends of those killed and the injured students and teachers. Although we know exhaustive details of what happened at Columbine, and are learning more from Blacksburg, we are still attempting to understand why. People are trying to cope with the terror that keeps thrusting itself into our lives. It has become obvious at this point that there are no easy answers. We need to examine the problems facing our youth, but it is critical that we take time to carefully consider the solutions being offered.

In the coming months there will be time, and there will be a need, for us to commit ourselves to finding a way to attempt to prevent this from happening again. We must ask ourselves how this could happen, and what can be done to prevent it. There is, I am sure, no simple solution. But we must pledge ourselves to doing what we can. After Columbine, the Nation took a serious look at school safety. But Bailey—and the murders in Pennsylvania last year at Nickel Mines Amish School—showed us that it is not always troubled students. Virginia Tech showed us it is not just grade schools or high schools. We need to think about ways to provide a better, more secure future.

Watching the aftermath in Blacksburg, I am reminded of the healing Colorado undertook 8 Aprils ago. I remember the memorial service held the weekend after the Columbine murders. Tens of thousands of people attended the memorial service. Among those gathered in sorrow, Joan and I witnessed a strong belief in God. We prayed together and searched for answers. I hope the students, faculty and families of Virginia Tech can find their way to face this terrible time.

Again, I offer my deepest sympathy to those who are suffering. And I want to let my colleagues from Virginia, and their constituents, know the people of Colorado will be thinking of you today as we mark the eighth anniversary of Columbine.

I yield the floor and suggest the absence of a quorum.

The ACTING PRESIDENT pro tempore. The clerk will call the roll.

The assistant legislative clerk proceeded to call the roll.

MR. REID. I ask unanimous consent that the order for the quorum call be rescinded.

The ACTING PRESIDENT pro tempore. Without objection, it is so ordered.

#### CONCLUSION OF MORNING BUSINESS

The ACTING PRESIDENT pro tempore. Morning business is now closed.

#### AMERICA COMPETES ACT

The ACTING PRESIDENT pro tempore. Under the previous order, the Senate will proceed to consideration of S. 761, which the clerk will report.

The assistant legislative clerk read as follows:

A bill (S. 761) to invest in innovation and education to improve the competitiveness of the United States in the global economy.

The ACTING PRESIDENT pro tempore. The majority leader is recognized.

MR. REID. Mr. President, sometime last year, word was received that Senators Bingaman and Alexander had an idea. The idea was to do something about our country's educational slide the wrong way. I spoke to them on several occasions. They wanted to see what we could do to increase our competitiveness internationally. Their suggestion was, first, let's do a study and find out how bad it is; is it as bad as we think it is. These two fine Senators got other Senators to join with them in the idea. They received a study from the National Academy of Sciences to find out where we were internationally with our science programs. The information was not good. As a result of that, we have the legislation now before the Senate.

This legislation is not the know-all and cure-all, but it is certainly a major step forward, if we can do this, and there is no reason we cannot.

I am happy and pleased to speak about the America COMPETES legislation. America COMPETES comes from the words "creating opportunities to meaningfully promote excellence in technology, education, and science," COMPETES. This is something we should do and are doing on a bipartisan basis. The bill is sponsored by both leaders and 50 Senators. That is a step in the right direction. Frankly, this is the way we used to do legislation here. There was so much that was done on a bipartisan basis. If we are able to complete this legislation, it will allow us to move forward on other meaningful legislation dealing with this subject generally.

The bill is the result clearly of a truly bipartisan effort. This legislation has been in the making for 2 years. I said last year. Time flies by. It was the year before last that these two Senators came to me to talk about this

subject. They asked the National Academy to make recommendations on steps we should take as a nation to maintain our competitive advantage. The result was the Augustine report, "Rising Above the Gathering Storm." The report warned that the Nation's traditional advantages are eroding at a time when many other nations are gathering strength and that decisive action is needed now.

We faced a challenge such as this before, one that occurred when I was in high school. In 1957, when the Soviets launched Sputnik, there was panic and concern. That panic and concern came about from our inability to do what they were doing to maintain our technological superiority. The Soviet Union clearly was ahead of us. Our great country responded to these threats quickly. The following year Congress passed, on a bipartisan basis, the National Defense Education Act, the sole purpose of which was to keep the United States ahead of the Soviet Union, to increase investment in math and science education. As a result of that bipartisan legislation, our country trained a whole new generation of engineers and scientists and ensured our preeminence in technology innovation for a generation.

The fact is, Federal investment in the basic sciences and research has long been a critical component of America's competitive dominance globally. Some economists have estimated that more than half of the country's economic growth since World War II has been a result of that technological innovation and dominance. Today, sadly, our position of dominance has been lost. We can debate where we are, but our dominance is not there—strong, of course, but dominant, no. We are challenged by emerging countries such as India and China where national investment in basic research, math, and science education continues to grow at a far greater pace than in the United States.

The Augustine panel cited many examples, but some statistics are striking. Consider that in 2005, more than 600,000 engineers graduated from institutions of higher education in China, 600,000; 350,000 in India; in the United States, 70,000—70,000 in the United States, 600,000 in China, and 350,000 in India. We can't keep up at that rate. China's population is more than the United States, of course, yet they graduate eight times the number of engineers even though they are only three times larger than the United States. The report also found that American 12th graders, seniors in high school, performed below the national average for 21 countries on a general knowledge of math and science.

Another study cited in the report had American 15-year-olds rank 24th out of 40 countries on a math assessment. I am embarrassed to tell the Senate and everyone within the sound of my voice Nevada students ranked 43rd out of 50 States in the Nation on math assessment.

As other countries become more competitive, it is clear we must refocus our energies on enhancing the Federal commitment to funding basic research in education.

My mind goes back to Paul Simon. The three of us had the opportunity to serve with him. Of course, Senator ALEXANDER served with him in different capacities when he was part of the Cabinet. He was a wonderful man, uneducated himself, no college education, wrote more than 20 books. He was a newspaper publisher when he was 19 years old. He knew that education was important, even though he was uneducated. He wrote a book called "The Tongue-Tied American," about our declining knowledge of languages and how it was hurting us internationally. I joined with him in legislation to give summer workshop programs sponsored by the Federal Government where we could pay math and science teachers on an elementary and secondary level so they could make more money than other teachers to keep up with math and science and keep them in the classroom. Paul Simon has passed away, but I am sure he is smiling on us today as a result of our trying to move forward on something that was his vision many years ago.

The America COMPETES Act addresses concerns of Paul Simon and the National Science Foundation. It is in effect a downpayment, a very modest first step in ensuring that America retains its competitive edge.

I extend my appreciation to Senators BINGAMAN and ALEXANDER for authorizing the academy study. This study, along with a number of recent reports and books, brought a much needed sense of urgency to this issue. There are also chairmen and ranking members of committees who have expressed an interest in and support of what we are doing. Senators INOUYE, STEVENS, KENNEDY, ENZI, LIEBERMAN, ENSIGN, MIKULSKI, HUTCHISON, and NELSON of Florida have been instrumental in crafting this legislation. This legislation will double the Federal investment for the National Science Foundation over the next 4 years and for the Office of Science at the Department of Energy over the next decade. I personally think it should be more than five. I am happy if we can do this. I hope we can. I am confident we can.

The bill provides grants to States in order to better align elementary and secondary school curriculum with the knowledge and skills needed for the global economy. Nevada has a program recognizing where we are in the overall scheme. It is called a P-16 Council.

This Federal legislation we have introduced and are considering now will also strengthen our math and science teaching workforce—that was Paul Simon's dream—by recruiting and training teachers to teach in high-need schools and help improve math instruction at the elementary and middle school level, through Math Now grants.

I suggest to the two authors and the two managers of this bill we go back

and look at the idea Senator Simon had—and I joined with him—that we have summer workshop programs sponsored by the Federal Government for elementary and secondary teachers so they can update their math and science skills, get paid for doing that, and stay teaching. We have such a shortage of math and science teachers.

On the high school level, we have far fewer physics teachers than we have schools. Of course, the other reason for doing this is, with the collective bargaining agreements—I support them, and we have them in many of our schools, in most of our school districts—it makes it very difficult to pay math or science teachers more than you can pay a PE teacher. This summer workshop program would allow that to take place.

So I hope that is something Senator ALEXANDER and Senator BINGAMAN will look at and see if we can come up with that. It is not only important to produce these math and science teachers but to keep them in the schools also.

America COMPETES will expand important advanced placement and international baccalaureate, IB, programs by increasing the number of math, science, and foreign languages AP and IB courses and preparing more teachers to teach these challenging courses. This is essential for all States. But take, again, Nevada, where only 6 percent of 12th graders took the AP calculus exam and only 7 percent took the AP science exam.

If signed into law, our bill will do much of what the Augustine Report recommended, but the truth is, in years to come we will have to do even more.

Although we make new and significant investments in research, we still must address our tax structure and make sure we do as much as possible to encourage investment in research and development.

In 1844, this Congress was approached by an individual who said he had a great idea. He could not raise the money in the private sector, but he had an idea that would revolutionize the communications of this country, and in 1844 Congress appropriated \$40,000 for a man to build a telegraph line between Washington, DC, and Baltimore, MD. It revolutionized—revolutionized—the communication industry, the telegraph.

The Federal Government is going to have to understand there are times when we have to advance moneys for research and development that cannot come from the private sector. I hope we will look to do it. We should start by finally making the R&D tax credit permanent.

We must also do more in education. The bill strengthens educational opportunities in science, technology, engineering, math, and critical foreign languages, but this, again, is a first step—but it is a big first step.

As an example, we must take a very hard look at our high schools. As Bill

Gates has said, and often, our high schools were designed for a 20th century economy and often do not address the needs of the 21st century workforce.

Bill Gates and Melinda Gates now are giving money to schools, school districts, but they have a lot of strings on it. For example, recently they gave money to a New York school district, with this proviso: You can only use this money if you are going to make your schools smaller.

Nevada, again—we have high schools in Nevada that have more than 5,000 students. How in the world can students learn well—and try to make that basketball team—with 5,000 students? Some of the schools are not that big now, but we have many schools in southern Nevada that have over 3,000 students. So the Gates recognize this. We have to recognize this also as part of our problem. The average school in America is about 50 years old.

We should also realize that unless our most basic commitments to America's students are met—by properly funding title I and No Child Left Behind and making a college education accessible and affordable—these efforts alone in this bill cannot prepare our students for the global economy.

The American COMPETES Act is a tremendously important step in maintaining this Nation's competitive advantage. I look forward to doing whatever I can to make this legislation a reality.

I express my appreciation to the Republican leader for joining in this legislation. This is something he and I have talked about now for 3 months since we have assumed our roles in this 110th Congress. We are going to work to make sure this legislation goes forward.

I say to everyone within the sound of my voice, for this legislation there is going to be no cloture motion filed.

We are either going to do this or not do it. This is something we need to do. We need to prove we can do things on a bipartisan basis. And if we cannot do this, Mr. President, we are in real trouble.

So I hope we can move forward on this legislation. I hope it sets a foundation for the first of many items we can do on a bipartisan basis to move this country forward.

The ACTING PRESIDENT pro tempore. The Republican leader is recognized.

Mr. McCONNELL. Mr. President, I thank my good friend, the majority leader, for his remarks and indicate that even though this is a Reid-McConnell bill, the true inspirations for this measure being on the Senate floor right now are Senator ALEXANDER from Tennessee and Senator BINGAMAN from New Mexico.

They made an extraordinary contribution in pulling together a disparate group of Senators from different committees to produce an extremely important piece of legislation.

The America COMPETES Act is vitally important legislation that this Senate must pass to ensure America retains its competitive edge in the global economy of the 21st century.

This bill, sponsored by my good friend and counterpart on the other side of the aisle, Senator REID, also enjoys broad bipartisan support, as I just indicated. Our two parties' cooperation shows how we can and should work together to accomplish important things for the American people.

The story of this bill began 2 years ago, when Senators ALEXANDER and BINGAMAN, from the Energy Committee, with then-Chairman PETE DOMENICI's blessing, asked the National Academy of Sciences a simple question: What are the top 10 actions that policymakers in Washington could take to keep America in the lead in science and technology for the 21st century?

That was the question. The National Academies turned to leaders of business, government, and academia for an answer, including three Nobel prize winners and a university president who is now the Secretary of Defense.

The respected former CEO of Lockheed Martin, Norm Augustine, headed the panel and produced the report we have all heard so much about, titled "Rising Above the Gathering Storm."

Mr. Augustine summed up the problem we face when he wrote in that report:

In the five decades since I began working in the aerospace industry, I have never seen American business and academic leaders as concerned about this nation's future prosperity as they are today.

However, his report also specifically recommended to us how we attack this problem, and maintain America's lead in science and innovation.

Additional recommendations were made by the Council on Competitiveness and by the President in his American Competitiveness Initiative.

The good news is, boosting the number of rocket scientists—along with mathematicians, engineers, and computer designers—is not rocket science. We currently have the greatest scientific and technological enterprise in the world.

We have the finest system of colleges and universities anywhere. But in many ways we have become complacent, while other countries are catching up.

They see by investing in science and technology and in the education of their citizens, they can attract jobs and create wealth. We must make the same investment in our future if we are to maintain our leadership through this century and beyond in the global marketplace.

This bill, S. 761, will help maintain and improve the competitive edge of the United States over the next century by increasing our investment in basic research, strengthening educational opportunities in science, technology, engineering, and math at all

educational levels, and encouraging young people to pursue careers in those fields.

From my home State of Kentucky, that means scholarships for future math and science teachers. It means increased research and development at our State universities, which could lead to new discoveries, new high-tech companies, and, of course, new jobs.

This fall, Kentucky will open the Academy of Mathematics and Science in Kentucky at Western Kentucky University, located in Bowling Green. Thanks to the leadership of Dr. Julia Roberts, director of the Center for Gifted Studies at WKU, the academy will bring together talented high-school students from all over the Commonwealth to study advanced math and science year-round—year-round—for college credit.

This bill will provide Federal support to advanced academies such as the Kentucky Academy throughout the Nation. A good friend of mine at the University of Kentucky, its president, Lee Todd, has also been working for decades to highlight the importance of math, science, and engineering in keeping Kentucky competitive. In a letter he recently sent me, President Todd wrote:

The National Academies' report "Rising Above the Gathering Storm" has the wrong title. The "storm" is not gathering—it is already here. . . . We are putting our economic future at risk. We must do better.

Now, President Todd knows what he is talking about. Prior to assuming the presidency of one of the State's flagship institutions of higher learning, he was a highly regarded engineer and successful entrepreneur. He has built technology companies that compete in the global economy, and he understands the challenges we face.

The America COMPETES Act will make it easier for leaders like him to create more opportunities for technical learning and careers. I want to commend him for all the hard work he has done, and I ask unanimous consent his entire letter be printed in the RECORD.

There being no objection, the material was ordered to be printed in the RECORD, as follows:

OFFICE OF THE PRESIDENT,  
UNIVERSITY OF KENTUCKY,  
Lexington, KY, March 8, 2007.

Hon. MITCH MCCONNELL,  
Washington, DC.

DEAR SENATOR MCCONNELL: The "America COMPETES Act" provides the visionary investment in education and research America needs, and we appreciate your continued leadership in support of the act. If we are serious about competing in the global economy, we have to pursue bold policy change.

The National Academies' report "Rising above the Gathering Storm" has the wrong title. The "storm" is not gathering—it is already here. America is not producing enough engineers, scientists, and mathematicians to maintain our role as a world leader in technological advance. We are putting our economic future at risk. We must do better.

The same is true for Kentucky. If we want to recruit and retain knowledge-based businesses, we have to change the way we teach

our kids. We must inspire a lot more of them to seek technical careers, and they need to have the skills necessary to fill high-paying jobs and create new ones. That is why I am leading a statewide Task Force on Science, Technology, Engineering, and Math (STEM). We will soon announce recommendations that have much in common with the "America COMPETES Act." Tinkering with Kentucky's current structure will not be enough if we want real and lasting change in math and science education. The time has come for fundamental change.

A second initiative the Task Force will share with the "America COMPETES Act" is recognition of the vital role energy education and research play in our future economic and homeland security. Kentucky is well positioned to provide solutions to America's need for energy independence.

Senator McConnell, I want our state to be a national leader in producing STEM graduates and solving America's energy problems. For too long, we have been willing to wait and watch as other states make tough choices that result in progress for them and leftovers for us. Kentucky has that opportunity to lead right now if we are willing to take action. I am ready to work with you in any way I can to move Kentucky and America forward.

Thank you again for your leadership in math and science and your strong and consistent support for the University of Kentucky.

Sincerely,

LEE T. TODD, Jr.,  
President.

Mr. MCCONNELL. Finally, Mr. President, I especially want to commend, once again, as I did at the outset of my remarks, my good friend from the neighboring State of Tennessee, Senator ALEXANDER, for his extraordinary leadership in building the case for this legislation, helping to craft its various components, and shepherding it through each stage of the process to this point.

It was Senator ALEXANDER who, 2 years ago, along with Senator BINGAMAN, asked the National Academy of Sciences the question that led to their recommendations, and sparked this entire process.

Their inquiry led to the release of the Academy's report, which made plain for all that the leadership of the United States in science and technology is eroding, with serious consequences for our workers, our jobs, our economy, and our very way of life.

Three different committees contributed titles to this bill—the Energy, Commerce and HELP Committees—so I also want to thank those committees' leaders—Senators INOUYE and STEVENS, Senators DOMENICI and BINGAMAN, and Senators KENNEDY and ENZI—for their cooperation and hard work on this important bipartisan bill.

In a sign of how cooperative their efforts have been, this bill was actually assembled last year when Republicans held the majority, but it was created in such a bipartisan fashion that we are bringing the very same bill up today under a Democratic majority.

That is a credit to the Republican leaders of these three committees, who worked closely with their Democratic counterparts every step of the way to craft this important legislation.

I also want to recognize the efforts of my friend and predecessor as Republican leader, Senator Bill Frist of Tennessee. Senator Frist invested a great deal of time and energy last year to bring these three committees together, and he was the primary sponsor of the bill last year, along with Senator REID.

America has led the world in innovation for over a century. From the light bulb, to the airplane, to the integrated circuit, America has given the world the tools to live happier, easier, and more productive lives.

Now the rest of the world is beginning to catch up. Nations such as China and India are seeing the benefits of brainpower and what it can do to remake their economies.

The America COMPETES Act is the best way to keep more of the jobs of the 21st century right here in America, and the best way to ensure that our children have the skills to keep America at the forefront of innovation and discovery.

Once again, I thank all of my colleagues for working on this comprehensive, bipartisan solution to reinvigorate scientific exploration and invention at home. This bill is an investment in our children, our schools, and in the future of America.

It is a bill this Senate can pass and the President can sign into law. With my colleagues' support, I hope to see exactly that in the very near future.

Mr. President, I yield the floor.

The ACTING PRESIDENT pro tempore. The Senator from New Mexico.

Mr. BINGAMAN. Mr. President, first I thank Senator REID and Senator MCCONNELL for their fine statements and their willingness to be the lead in bringing this bill to the floor. It is bipartisan legislation. It is legislation that was developed in the last Congress. We were not able to complete action on it there, so we are trying to do so at this time.

It does represent the work of three committees over the past year. Those are the Energy and Natural Resources Committee, the Commerce, Science and Transportation Committee and, of course, the Health, Education, Labor and Pensions Committee. I am fortunate to serve on two of those committees.

The chairman and ranking member of each of the three committees are cosponsoring this bill. In fact, we now have 57 Members of the Senate who are cosponsoring this legislation, with Senators REID and MCCONNELL as the lead sponsors.

This bill reflects a deep undercurrent of anxiety in this country. It was highlighted recently by the very best-selling book by Tom Friedman called "The World Is Flat." It is also highlighted by the report to which Senator MCCONNELL just referred, the "Rising Above the Gathering Storm" report issued by the National Academies of Science and Engineering. Both of these publications highlight a strengthening, worldwide, of the effort in science and technology.

Although we in the United States are still a world leader in these areas, other nations are clearly catching up. Without effort and intervention now, and attention to this issue now, I fear we may lose our edge in high technology areas that are critical to our future economy. The high technology competition has been an ongoing effort and continues and will continue indefinitely.

In the 1980s, during the Cold War, we were about to lose our semiconductor leadership to Japan. Motivated then by national security concerns, the U.S. Government worked with industry to help preserve our domestic chip-making capability. Along with Secretary of Defense Caspar Weinberger and Dr. Bob Noyce, Gordon Moore from Intel, and others, we were able to launch a public-private partnership called Sematech. This partnership developed early phase technologies designed to keep our semiconductor industry competitive.

Sematech was a success. It kept our industry competitive through the 1990s and even today. But the issue we are faced with here in 2007 is even more troubling. India and China and other countries from the former Soviet Union now represent nearly 3 billion new capitalists who are coming at us in a competitive way through the Internet where, in one click, anyone in this country can order a product from anywhere in the world and have that delivered to his or her doorstep. Not only can these countries and entrepreneurs in these countries manufacture at a fraction of the cost that oftentimes is required here in the United States, but in coordination with their Governments they are climbing up the value chain by developing the professional talents in areas such as research and engineering and in telemedicine and in finance—in a whole variety of areas.

We have taken for granted that our Nation would never be displaced in many of these areas. These are areas that represent part of the pillars of our national identity. Many Americans have grown up assuming the United States would always be the leader in high technology, but that is not a foregone conclusion. It is not the simple box fan that is being made in China today that concerns people. It is the sophisticated code from Beijing for enterprise server software or state-of-the-art locomotives and turbines designed in Bangalore when they used to be designed in this country.

The data paints a disturbing picture about the trends with which we are faced. Right now the United States invests about 2.7 percent of its gross domestic product in research and development. That is not bad. It puts us No. 5 in the world in the percentage of our gross domestic product invested in research and development. Yet we are still behind Korea. We are still behind Japan. Both those countries invest over 3 percent of their gross domestic product in research and development.

However, the issue is not to look at the static snapshot that says today we

are fifth in this level of effort, but to look at the change in the rate of commitment over time.

Let me do that with a chart here. I have several charts I want to briefly take people through, to make the case for what we are up against. This is the Emerging Economies Rapidly Increasing Research and Development Investments chart. The top line with the orange dots upon it shows the United States and shows we are investing more than other nations. But the bottom line, which, of course, is rising rapidly, is fast-growing economies. Those economies are specifically China, Ireland, Israel, Singapore, South Korea, and Taiwan. So clearly we have a circumstance where the rate of change is not favorable to us. In fact, during this same timeframe, China's research and development per GDP grew from .6 percent to 1.4 percent. That is still well behind us, the United States, but it doubled in slightly more than a half dozen years, at a 7-percent annual growth rate.

The trend line on the chart is self-evident. We need to begin to focus again on this area if we are going to maintain our ability to compete in biotechnology, in semiconductors, in flat panel displays. In some of those areas, particularly flat panel displays, the reality is we no longer compete effectively.

Let me move to a second chart. This second chart shows the widening trade deficit in certain advanced technologies, in areas such as semiconductors, pharmaceuticals, and telecommunications. As the sophistication of the imports we bring into this country increases, so will the sophistication of the research and development that is needed to support this type of manufacturing. You can see this orange line here, which represents the trade balance in advanced technology. You can see that up until somewhere around 2000, or the late 1990s, we had a very positive balance of trade with regard to advanced technology products. Since then, the line has been going down and going down rapidly. This is a concern which all of us should focus on, and this legislation is designed to address this concern head on.

The third chart shows the average science literacy score of 15-year-old students by country. This is very hard to read. Unfortunately, the lettering is too small. But the main point can be understood. These, of course, are the future scientists and engineers in the world, young people on whom we depend to become future scientists and engineers and innovators. Obviously, we are concerned that the United States ranks way down here on the chart compared to 15-year-old students in all of these countries above us: Japan, South Korea, Australia, Netherlands, Czech Republic, New Zealand, Canada, Switzerland, France, Belgium, Sweden, Ireland, Hungary—you can follow on down. We come in right behind Iceland. We need to do better. I think

everyone in this country who is concerned about the future of our economy and the future of our children knows we need to do better by those children and provide a better opportunity for them to compete in this world.

Let me move to the fourth chart. If we look further up the pipeline of future innovators, the news is not that much better. This chart shows the fraction of United States undergraduates who receive science and engineering degrees, so you can see that at least three times more college students graduate with science and engineering degrees in China each year than in the United States. This is not a favorable trend either. Obviously, there are more people in China. But our ability to compete in the world, to a substantial extent, is going to depend on how many people we can train and equip to compete in this science and competition.

The fifth chart I have here relates to trained scientists and engineers. This shows that China now produces almost as many Ph.D.'s as the United States. Again, the trend is the disturbing part of this chart. It is not that China is producing nearly as many doctoral degrees in the natural sciences and math and engineering as is the United States today. That is a fact but one that does not cause great concern. The concern is that we were dominant in this area and have been for a very long time. Now that has changed very dramatically. Universities in these other countries are first-class universities and people need to focus on that. Universities such as Tsinghua, in China, are very high quality. If they turn out a Ph.D. in engineering or science or the natural sciences in these schools, those individuals are world-class scientists in their fields.

There is a 1995 quote by Alan Greenspan that sums up the importance of investment in research and development and education:

Had the innovations of recent decades, especially in information technologies, not come to fruition, productivity growth would have continued to languish at the rate of the preceding 20 years.

Much of the prosperity we have enjoyed and have come to expect has been the result of the focus we have had on science and engineering in our history.

The final chart I have here is one from "The Economist." It is based on the 2006 work that was done by three individuals at the Federal Reserve. It deals with this broad category of so-called intangible assets, assets such as research and development, information technology, even finance.

Basically what it says is, as a percentage of gross domestic product, there is a very large amount of our gross domestic product that is tied to these so-called intangible assets. They now account for nearly 11 percent of our gross domestic product—that is \$3.1 trillion in 2003. In other words, growth that is attributed to such areas is absolutely crucial to our overall economy—again, another reason why

we need to be concerned about this issue.

With this background, let me briefly talk about what is in the bill before I defer to my colleague here, Senator ALEXANDER. In the Energy and Natural Resources Committee, the portion of the bill that was developed out of that committee, we do several things. First, we create a director for math and science education in the Department of Energy whose job it is to coordinate math and science education, departmentwide. The director would report to the Under Secretary for Science in the Department of Energy.

Next, we would significantly increase funding for the Department of Energy's Office of Science to match the multiyear funding profile of the President's advanced competitiveness initiative which he presented to us here this year.

Third, the bill proposes to create an Advanced Research Projects Agency for Energy, to translate basic research that is carried out in the Office of Science into solutions for critical problems facing the applied energy programs in the Department.

Examples of such problems would include hydrogen fuel storage using new materials or applying nanoscience to a new generation of solid-state lights.

The bill will also address broader themes related to math and science education. According to the National Academy of Sciences, the technical building blocks of our Nation's economic strength have been eroding for a time. We need to produce students who are prepared to meet the challenges of the 21st century. That means more attention to math and science education.

America COMPETES contains a number of important provisions to improve K-12 math and science education, strengthen science and math skills of our teaching workforce. I know Senator REID talked eloquently about that need and, of course, the commitment our former colleague, Paul Simon, had to progress in that area.

First, it provides incentives for universities to systematically change the way they prepare teachers to teach math and science. The legislation provides grants to universities to integrate the teacher preparation programs with rich content subject matter in math and science, develop bachelor's degree programs in math and science with concurrent teacher certification, as well as master's degree programs in math and science for people who are currently teaching in our schools.

Second, to make these programs attractive to students who are inclined to study these subjects—math, science, and engineering—the legislation significantly expands the National Science Foundation scholarships for students to become math and science teachers.

The legislation significantly expands opportunities for teachers to strengthen their math and science skills. The bill increases training for teachers to

become qualified to teach advanced placement courses and international baccalaureate courses in math and science. The bill provides significant training opportunities for teachers at both the National Science Foundation, as well as our National Laboratories, and there I think some of the summer programs Senator REID was talking about are intended to take place at our universities, at our laboratories. Clearly, he is right in saying we need to provide the financial wherewithal so that teachers can take advantage of these programs and can upgrade their knowledge and then give that knowledge to their students the next school year.

Further, the legislation provides grants to States to promote better alignment of elementary and secondary education with the knowledge and skills needed for success in postsecondary education and in the 21st century workforce.

The bill significantly increases funding for the National Science Foundation, essentially doubling that budget in 5 years, while ensuring that the math and science education programs that are in the National Science Foundation increase at the same rate as the overall budget increases.

The bill helps manufacturers by increasing funding for the National Institute of Standards and Technology, or NIST, by 33 percent over 4 years.

As I have said many times, this America COMPETES bill is only an authorization bill. The hard part, obviously, is going to be providing the funds to carry out the programs in this bill to meet these authorization targets we have set.

In this regard, we were successful just a month or so ago, with Senator ALEXANDER's good help, in adopting an amendment in the Senate which was an amendment to the budget resolution. It was adopted 71 to 1 to provide \$1 billion in additional leeway or additional opportunity to meet the President's request in the areas of funding for the Department of Energy's Office of Science, the National Science Foundation, and NIST. Because of that amendment to the budget resolution, virtually all of the authorization we are calling for in this legislation will be permitted to be appropriated this year, and that is very good news.

This bill is a good bill. It is bipartisan. Like most bipartisan bills, it is the product of much negotiation. Many competing views, many competing interests have had a chance to be heard.

I am proud of the way this bill has come together. Our staffs deserve great credit for the hard work they have put into this legislation.

I particularly commend Senator ALEXANDER. He is the person who got this initiative started and came to me initially and said: Let's do this letter to the National Academies and see if they will do a study and tell us what are the most important things we can do in this country to keep this country competitive in world markets. That is what

then led to the Augustine Commission report and, of course, that combined with the other reports that came forward—and there were several other very useful reports—that have gotten us to this point. Senator ALEXANDER deserves particular credit for the success we have had so far.

I hope all colleagues will look seriously at this legislation and will support the effort to move ahead with it. This is authorizing legislation. In doing the appropriations bills that will come to the floor later this year, we still will have an opportunity to debate the specific funding levels for some of these programs. This sets out a framework for progress which can be very beneficial to this country and a framework which is long overdue.

I urge my colleagues to support the legislation.

I yield the floor. I know my colleague from Tennessee wishes to speak at this time.

The ACTING PRESIDENT pro tempore. The Senator from Tennessee.

Mr. ALEXANDER. Mr. President, I thank the Senator from New Mexico. No one in the Senate on either side of the aisle has been more consistent or more effective in advancing our Nation's position in science and technology. He is also a delight to work with. It is rare to have a chance to work across the aisle in the way we have the last couple of years, not only on this legislation, but Senator BINGAMAN, for example, noticed that we were losing our edge in world-class computing. He saw that because of a visit to Japan. He came to me, and we worked together to try to restore that edge. He constantly is doing that in a quiet and effective way. It is a pleasure to work with him.

I also thank the majority leader, Senator REID, and the Republican leader, Senator McCONNELL. Senator BINGAMAN and I went to see the majority leader 2 years ago when he was the minority leader. We asked him to do exactly what he has done. He and Senator Frist did. They created an environment in which this bill had a chance to succeed. Then Senator McCONNELL stepped right up, following Senator Frist's tremendous help and leadership in this effort, and it is fairly remarkable that we worked so evenly together in the last Republican Senate on this bill that the legislation was introduced in the Democratic Senate in the same way because we worked together on it and, hopefully, that has produced a better result.

I begin my remarks with a story. Last August, a group of Senators went to China. We were led by two of our most distinguished Members, Senator STEVENS and Senator INOUYE, the two leaders of the Commerce Committee and two of the major contributors to this legislation. Those two Senators were very well received in China. Senator INOUYE, of course, is a Congressional Medal of Honor winner from World War II, and Senator STEVENS

was a Flying Tiger. He flew the first cargo plane into Beijing toward the end of World War II. So he was very well received in China.

As a result, we had a chance to meet with the senior leaders of China in a way most Americans had not to that time. We spent an hour with President Hu. We spent another hour with the No. 2 leader in China, Mr. WU, who is chairman of the National People's Congress.

We talked about the issues one would expect an American delegation of a dozen Senators would talk about with the leaders of China. We talked about their military posture. We talked about North Korea. We talked about Iraq. We talked about Iran. But, Mr. President—I can still see this—in both of the meetings we had, one with Mr. Hu, the second with Mr. WU, there was one subject about which those two leaders of China were most animated, and that was the subject we are discussing today: how to develop China's brain power advantage so they can create more good, new jobs in China. That was the subject they really wanted to talk about.

President Hu had gone to the Chinese Academy of Sciences and the Chinese Academy of Engineering just a month earlier in July. He assembled them in the Great Hall of the people. He outlined a new 15-year plan to make China a technology leader in the world.

In his speech, President Hu said China must "promote a huge leap forward in science and technology. We shall put strengthening independent innovation capability at the core of economic structure adjustment."

Anyone who follows China knows that when their leaders talk about leaps forward, it is a pretty big deal. President Hu's new plan appears more likely to succeed and includes reforming China's universities and massively investing in new research.

We regularly see stories of how Chinese-born academicians, some of our most distinguished faculty members at our major universities, are now accepting invitations to go back to China, their homeland, and create great universities there. There are a lot of people here—one-half of the Nobel Prize winners in physics who are American are immigrants or the sons and daughters of immigrants.

So China is serious about this plan. Mr. Hu said:

We all bear the time-honored mission to provide strong scientific support for the construction of a well-off society by improving our independent innovation capability and building an innovative country. I hope that our scientists and technicians will strive hard to make our brilliant achievements and constantly contribute to our country and our people.

Those are the leaders of China. They know what to do.

The United States has a remarkable position. As Senator BINGAMAN said, Senator REID said, and Senator McCONNELL said, we don't want to take it for granted because we can't. But let's

stop and think about where we are. This huge brain power advantage we have in the United States of America has given us a situation in which we produce about 30 percent of the gross national product in the world in for about 5 percent of the people. About 30 percent of all the dollars, volume in the world this year is being produced in this country, a country that only includes 5 percent of the people. How does that happen? The United States has a number of advantages: its location, its resources, the great diversity we have here, the fact we have turned all that diversity into one country. But when we look at all of our advantages—and I should quickly put the great entrepreneurial engine we have here, the fact that if you want to come to a big country and start from scratch and create a company—and I have had the privilege to help do that in the private sector—this is the place to do it. But when you look at our major advantage, it is our brainpower.

No other country has had the broad system of education we have had. No other country has the large number of great research universities the United States of America has. No other country has the great National Laboratories we have. As a result, over the last century, especially since World War II, no other country has come close to turning its brainpower advantage into jobs, into dollars, into a high standard of living for a large number of people, and the rest of the world sees that. They see it on television. They see it on the Internet. They see it because more than half a million students from around the world, many of the brightest men and women in the world, come here to our universities, and they see what we have been able to do, and they say: Why can't we do this at home in China? Why can't we do this at home in India? Why can't we do this in Ireland? And they are doing it. We are glad they are doing it. We want them to have a high standard of living, too. The more money they make, the more goods they can buy from the United States of America. So we encourage that activity.

It also spreads our democracy, our ideals. We go to Thailand or some other country, and we find the Minister of Agriculture is a graduate of the University of Tennessee. He has learned here. He goes there and teaches about agriculture, and he promotes our ideas. Our higher education system has probably been the most effective foreign aid we have ever invested in, just those half million students who go there.

However, we are at risk of losing our brainpower advantage. If we lose our brainpower advantage, we lose our advantage and our standard of living. In other words, in plain English, we don't have as much money in our pockets, we don't have as many good jobs, and our families don't have the kind of prosperity many have come to take for granted. That is what this piece of legislation is about.

We talk a lot about outsourcing jobs, about growing new jobs. Well, this is the way to keep good new jobs in the United States and to grow them. When a graduate of a university, such as the student at the University of Maryland—I think he dropped out, actually—a foreign student—creates Google, that creates thousands and thousands of new jobs in the United States, as Thomas Edison did years ago, as Bill Gates did more recently, and as thousands of entrepreneurs do every day. It takes the brainpower advantage to create the job and it takes the brainpower advantage to work at the facility or the plant that has the jobs.

That is why, toward the end of a long Budget Committee hearing 2 years ago, I was getting a little depressed listening to what I heard about the numbers. According to the budget 2 years ago, and the budget last year, and the budget this year, we are on an unsustainable course in terms of being able to pay for Medicare and Medicaid. So the question came to me: Well, if we are going to squeeze out everything else in order to pay for Medicare and Medicaid and other programs, the war in Iraq, then how are we going to invest in this great engine of brainpower that creates the money that pays all the bills? I struggled with this as the Governor of Tennessee. I was trying to raise our standard of living in Tennessee. We were the third poorest State 25 years ago when I became Governor, based on family incomes. We already had low taxes. We had a right-to-work law. We needed to change some rules about the usury limit in banking. We needed to add a new four-lane highway system. All those were progrowth. But the most progrowth action I discovered we could take was to improve our colleges and our universities and our research facilities. That is progrowth.

As a result of better schools, better colleges, and better universities, combined with our other advantages, we moved ahead in our State. Better schools meant better jobs. Better colleges and universities mean better jobs. More research means better jobs. So we are talking today about better jobs—progrowth.

We better realize as well that we have some pretty big bills to pay. Last year, we spent \$237 billion on debt, \$378 billion on Medicare, \$545 billion on Social Security, \$70 billion or more on hurricanes, and we are spending about \$4 billion a week on Iraq. What this legislation does is authorizes \$4 billion a year over the next 4 years. As Senator BINGAMAN said, we made room for it in the budget this year to create and encourage and continue to push ahead this brainpower engine that creates the money to pay for all these necessary and urgent needs we have, these priorities we have. This is a progrowth piece of legislation.

I would say this may be the most important piece of legislation the Congress considers in this 2-year session. If

it is not the most important piece of legislation, there is certainly no more important subject to most American families than: How do I keep money in my pocket to pay my bills? How do we keep our jobs from going to India and China? How do we keep our economic advantage? How do we come close to continuing to be the country that produces 30 percent of all the money in the world for only 5 percent of the people? That is why, at the end of that Budget Committee hearing I mentioned a little earlier, I literally walked down the street to the National Academy of Sciences and asked them, on behalf of Senator BINGAMAN and myself, with the approval of Senator DOMENICI, the chairman of our committee, and with the endorsement of Representatives BOEHLERT and GORDON in the House of Representatives—I said: Most ideas in Washington fail for lack of the idea. You are here at the end of a long day in the National Academies. You are supposed to be our advisers. So let me ask you a question: Why don't you tell us the 10 most important things we can do, in priority order, to keep our brainpower advantage? I said to them: I am merely one Senator, but I will bet if you do that, we will do it. We will take your advice.

The National Academy of Sciences and of Engineering and the Institute of Medicine formed an immediate group. They asked Norm Augustine, the former chief executive officer of Lockheed Martin and a member of the National Academy of Engineering, to chair the group. He turned to 21 distinguished Americans who know a lot about the world and our country, Craig Barrett, chairman of the board of Intel; Steven Chu, cowinner of the Nobel prize in physics and Director of Lawrence Berkeley National Laboratory; Robert Gates, who was then head of Texas A&M and now is the Secretary of Defense, and a number of others; the former head of MIT, Peter O'Donnell, a Texas businessman who has worked on AP courses, and they did this report: "Rising Above The Gathering Storm." They didn't make 10 recommendations, they made 20, and they made them in priority order. Their priorities began with K-12 education. They went next to engineering and research. They went next to higher education. They went next to incentives for innovation.

At that point, we formed a bipartisan group of Senators and began to have what we called "homework sessions" with the various agencies of the Federal Government that had jurisdiction over these programs and the areas where the programs would fit. We also recognized that Senator LIEBERMAN, Senator ENSIGN, and others had been working hard with the Council on Competitiveness, and they had similar recommendations. We also acknowledged that Senators HUTCHISON, BOND, and MIKULSKI had for many years been advocating various aspects of these programs, so we tried to integrate all of this into a whole. That produced a long

piece of legislation that had to make its way through five different committees, but it attracted 70 sponsors last year—35 Democrats, 35 Republicans. The Republican leader, Senator Frist, and the Democratic leader, Senator REID, were the principal sponsors of the bill.

Senator BINGAMAN has done a good job of outlining most of the provisions of the bill, so I will, in a few minutes, put those into the record, but there is no other piece of legislation during the past 2 years that was so broadly recommended by disinterested groups outside of the Senate and the House, that has been worked on by so many Senators here, and that has moved forward in the way this has. Making this even more remarkable is not only was it introduced by the Democratic and Republican leaders, it has been brought directly to the floor for debate. So what we hope is our colleagues will carefully read the bill, bring their amendments to the floor, and maybe we can operate in an old-fashioned way here. Maybe we can consider the amendments, or the improvements, debate them, vote on them, go to the next amendment, and then after we have finished with that, have a vote on whether to pass the bill, which I believe we will. I think we have a good chance of doing that.

Mr. President, I wish to now insert into the RECORD a few items that are important for our colleagues and those who are following this debate, so I ask unanimous consent that following my remarks a "Dear Colleague" letter of April 10, written by Senator REID and Senator McCONNELL to all of our colleagues, signed by the chairmen and Democratic and Republican leaders of the three major committees which contributed to this, and which produced 50 cosponsors—we hope there will be more by next week—be printed in the RECORD.

The ACTING PRESIDENT pro tempore. Without objection, it is so ordered.

(See exhibit 1.)

Mr. ALEXANDER. Mr. President, I ask unanimous consent that a two-page summary of the America COMPETES Act be printed in the RECORD.

The ACTING PRESIDENT pro tempore. Without objection, it is so ordered.

(See exhibit 2.)

Mr. ALEXANDER. Mr. President, I ask unanimous consent that a list of the cosponsors of the America COMPETES Act, the 50 cosponsors, as it stands today, be printed in the RECORD.

The ACTING PRESIDENT pro tempore. Without objection, it is so ordered.

(See exhibit 3.)

Mr. ALEXANDER. Finally, Mr. President, I ask unanimous consent that a section-by-section analysis of the America COMPETES Act be printed in the RECORD.

The ACTING PRESIDENT pro tempore. Without objection, it is so ordered.

(See exhibit 4.)

Mr. ALEXANDER. Mr. President, we will have plenty of time to debate this next week, so I will reserve most of my comments until then, but let me reiterate some of the major provisions that are here. As Senator BINGAMAN said, this is only an authorization bill. It is permission to establish programs, but it is backed up by an amendment to the Budget Act which creates room in the appropriations bill to pay for these programs.

Here is what we intend to do: Double funding for the National Science Foundation; set the Department of Energy's Office of Science on track to double its funding; strengthen the skills of thousands of math and science teachers by establishing training and education programs at summer institutes hosted by the national laboratories; and by increasing support for teacher institutes for programs at the National Science Foundation.

These are the kinds of programs that Senator REID, the majority leader, was talking about.

Expand the teacher scholarship programs at NSF; help establish academies for math and science in the various States.

North Carolina has had one for a long time, and 20 years ago, when I was Governor, I went to see if Tennessee could create one. We decided we didn't have the money to do it, so we created a summer Governor's school, which turned out to be a good idea, where outstanding students from math and science could go to the University of Tennessee for 4 weeks in the summer. The faculty loves it, the students love it, and they participate in the Oak Ridge Laboratory. They go back fired up into their classrooms, and the teachers are fired up as well. Our Governor Bredesen wants to create a summer school for math and science, and he has started on a modest basis, but this will help him expand that.

We will expand advanced placement in international baccalaureate programs by increasing the number of teachers who are trained to teach math, science, and foreign languages. This would allow thousands of new students to take these courses. The AP courses, as we call them, are a good track to college, and college is a good track to success. Those students are the ones who will help create the jobs to keep our high standard of living. But we have a lot of students, many of them lower income, who don't take these courses and who easily could. So we will help pay for their tests, and we will train more teachers so they can be taught, and we will see that three or four times more students will be able to do this.

These programs weren't picked out of thin air. This group of distinguished Nobel laureates, university presidents, and business leaders spent their summer 2 years ago reviewing many programs. For example, the AP program comes from a Texas program which has

been successful for 10 years. They picked the 20 best ideas in priority order from among hundreds of ideas. This is not merely a group of Senators and Congressmen picking our best friend's favorite program. We all have one of those. This is the National Academies of Sciences and Engineering and the Institute of Medicine reviewing hundreds of programs with a distinguished panel in answering our question exactly what do we need to do to keep our brainpower advantage, and they say here are the first 20 things you ought to do.

Not in this legislation are other provisions that were part of this report and that were acted on in the last Congress. One was the temporary extension of the research and development tax credit. It should be made permanent. Another are several provisions for attracting and keeping in this country talented professionals from overseas. These 500,000 foreign students who are here include some of the brightest students from China, some of the brightest students from India, some of the brightest from around the world. They are going to create jobs somewhere. We would like for them to stay and create jobs here, yet our archaic immigration laws prevent that. They require these students to swear they are going home before they come. They make it hard for them to stay once they get here.

So the Senate, last year, in debating the immigration bill, adopted three of the provisions from this report. One, for example, pins a green card on any foreign student who gets a graduate degree in math, science, engineering and technology so that person can stay here and create jobs for us here.

I am hopeful when we get to the immigration legislation within a few weeks that we will do at least that much to change our archaic immigration laws and allow those students to stay here and create jobs for us. We talk a lot about outsourcing jobs. This would be insourcing brain power, and we would be smart to do it.

I particularly thank our staffs, and we will do this specifically by name next week. This is a complex bill with many different parts, as the section-by-section analysis shows. They have worked evenly to try to make this a well-crafted bill. We have more work to do.

I conclude by again thanking the Democratic and Republican leaders, Senator BINGAMAN, Senator DOMENICI, especially, who was chairman of our committee last year, STEVENS and INOUYE, ENZI and KENNEDY, ENSIGN and LIEBERMAN, BOND, HUTCHISON, CHAMBLISS, MURKOWSKI, and MIKULSKI—all of these Senators made major contributions. I am sure they will be on the Senate floor next week to address this legislation and to support it.

We are talking about keeping our brain power advantage so we keep our jobs. We are talking about a country that has grown accustomed to 30 per-

cent of all of the money in the world being produced each year with just 5 percent of the people, and we are saying, unless we take at least these steps, that won't continue.

#### EXHIBIT 1

U.S. SENATE,  
Washington, DC, April 10, 2007.

DEAR COLLEAGUE: We are writing to invite you to cosponsor the America COMPETES Act; a bipartisan bill to help America maintain its edge in science, technology, engineering, and mathematics in an increasingly competitive global economy. An earlier version of this bill was introduced in the final days of the 109th Congress as S. 3936.

The America COMPETES Act is based upon recommendations from both the national Academies' "Rising Above the Gathering Storm" report and the Council on Competitiveness' "Innovate America" report. It contains revised versions of the legislation approved by both the Senate Energy and Commerce Committees [from the 109th Congress] in response to those recommendations: S. 2197, the PACE-Energy bill, and S. 2802 the American Innovation and Competitiveness bill, which were reported without opposition to the Senate floor. The bill also includes provisions developed by the bipartisan leadership of the HELP Committee to improve science, technology, engineering, mathematics, and critical foreign language skills.

The competitiveness package would significantly increase the federal investment in basic research, foster and innovative infrastructure, improve the teaching of math, science, engineering and technology to our children, and encourage the brightest minds to pursue careers in these fields. Among other provisions, the bill would: Double the investment in basic research at the national Science Foundation (NSF), the National Institutes of Standards and Technology (NIST), and the Department of Energy's Office of Science (DOE-SC) over five to ten years; Improve teacher training in math and science, through summer institutes hosted by the NSF and the DOE-SC and grants to increase university degree programs that combine math and science study with concurrent teacher certification; and Increase support for Advanced Placement programs to expand access for low income students to take and succeed in college preparatory courses.

This bill alone will not secure American leadership in the decades to come. But it is a critical first step toward protecting our competitive position in the world. We hope you will join us in this effort and cosponsor this bipartisan legislation.

Sincerely,  
Harry Reid, Majority Leader; Jeff Bingaman, Chairman, Committee on Energy and Natural Resources; Daniel K. Inouye, Chairman, Committee on Commerce, Science, and Transportation; Edward M. Kennedy, Chairman, Committee on Health, Education, Labor, and Pensions; Joseph I. Lieberman, U.S. Senator; Barbara A. Mikulski, U.S. Senator; Bill Nelson, U.S. Senator; Mitch McConnell, Republican Leader; Pete V. Domenici, Ranking Member, Committee on Energy and Natural Resources; Ted Stevens, Vice-Chairman, Committee on Commerce, Science, and Transportation; Michael B. Enzi, Ranking Member, Committee on Health, Education, Labor, and Pensions; John Ensign, U.S. Senator; Lamar Alexander, U.S. Senator; Kay Bailey Hutchison, U.S. Senator.

## EXHIBIT 2

## SUMMARY OF THE “AMERICA COMPETES ACT”

The “America COMPETES Act” is a bipartisan legislative response to recommendations contained in the National Academies’ “Rising Above the Gathering Storm” report and the Council on Competitiveness’ “Innovate America” report. The bill is similar to the “National Competitiveness Investment Act” that Senators Frist, Reid, Stevens, Inouye, Domenici, Bingaman, Enzi, Kennedy, Ensign, Lieberman, Alexander, Mikulski, Hutchison, and others introduced in September 2006. Several sections of the bill are derived from proposals contained in the “American Innovation and Competitiveness Act of 2006” (S. 2802), approved without opposition by the Senate Commerce Committee, and the “Protecting America’s Competitive Edge Through Energy Act of 2006” (S. 2197) approved without opposition by the Senate Energy Committee last year. Accordingly, the America COMPETES Act focuses on three primary areas of importance to maintaining and improving United States’ innovation in the 21st century: (1) Increasing research investment, (2) strengthening educational opportunities in science, technology, engineering, and mathematics from elementary through graduate school, and (3) developing an innovation infrastructure. More specifically, the America COMPETES Act would:

## INCREASE RESEARCH INVESTMENT BY:

Doubling funding for the National Science Foundation (NSF) from approximately \$5.6 billion in Fiscal Year 2006 to \$11.2 billion in Fiscal Year 2011.

Setting the Department of Energy’s Office of Science on track to double in funding over 10 years, increasing from \$3.6 billion in Fiscal Year 2006 to over \$5.2 billion in Fiscal Year 2011.

Establishing the Innovation Acceleration Research Program to direct federal agencies funding research in science and technology to set as a goal dedicating approximately 8 percent of their Research and Development (R&D) budgets toward high-risk frontier research.

Authorizing the National Institute of Standards and Technology (NIST) from approximately \$703 million in Fiscal Year 2008 to approximately \$937 million in Fiscal Year 2011 and requiring NIST to set aside no less than 8 percent of its annual funding for high-risk, high-reward innovation acceleration research.

Directing NASA to increase funding for basic research and fully participate in inter-agency activities to foster competitiveness and innovation, using the full extent of existing budget authority.

Coordinating ocean and atmospheric research and education at the National Oceanic and Atmospheric Administration and other agencies to promote U.S. leadership in these important fields.

## STRENGTHEN EDUCATIONAL OPPORTUNITIES IN SCIENCE, TECHNOLOGY, ENGINEERING, MATHEMATICS, AND CRITICAL FOREIGN LANGUAGES BY:

Authorizing competitive grants to States to promote better alignment of elementary and secondary education with the knowledge and skills needed for success in postsecondary education, the 21st century workforce, and the Armed Forces, and grants to support the establishment or improvement of statewide P-16 education longitudinal data systems.

Strengthening the skills of thousands of math and science teachers by establishing training and education programs at summer institutes hosted at the National Laboratories and by increasing support for the

Teacher Institutes for the 21st Century program at NSF.

Expanding the Robert Noyce Teacher Scholarship Program at NSF to recruit and train individuals to become math and science teachers in high-need local educational agencies.

Assisting States in establishing or expanding statewide specialty schools in math and science that students from across the state would be eligible to attend and providing expert assistance in teaching from National Laboratories’ staff at those schools.

Facilitating the expansion of Advanced Placement (AP) and International Baccalaureate (IB) programs by increasing the number of teachers prepared to teach AP/IB and pre-AP/IB math, science, and foreign language courses in high need schools, thereby increasing the number of courses available and students who take and pass AP and IB exams.

Developing and implementing programs for bachelor’s degrees in math, science, engineering, and critical foreign languages with concurrent teaching credentials and part-time master’s in education programs for math, science, and critical foreign language teachers to enhance both content knowledge and teaching skills.

Creating partnerships between National Laboratories and local high-need high schools to establish centers of excellence in math and science education.

Expanding existing NSF graduate research fellowship and traineeship programs, requiring NSF to work with institutions of higher education to facilitate the development of professional science master’s degree programs, and expanding NSF’s science, mathematics, engineering and technology talent program.

Providing Math Now grants to improve math instruction in the elementary and middle grades and provide targeted help to struggling students so that all students can master grade-level mathematics standards.

Expanding programs to increase the number of students from elementary school through postsecondary education who study critical foreign languages and become proficient.

## DEVELOP AN INNOVATION INFRASTRUCTURE BY:

Establishing a President’s Council on Innovation and Competitiveness to develop a comprehensive agenda to promote innovation and competitiveness in the public and private sectors.

Requiring the National Academy of Sciences to conduct a study to identify forms of risk that create barriers to innovation.

## EXHIBIT 3

## COSPONSORS, ALPHABETICAL

[\* = original cosponsor]

Sen Alexander, Lamar [R-TN]—3/5/2007\*; Sen Bennett, Robert F. [R-UT]—4/19/2007; Sen Biden, Joseph R. [D-DE]—4/18/2007; Sen Bingaman, Jeff [D-NM]—3/5/2007\*; Sen Brown, Sherrod [D-OH]—3/15/2007\*; Sen Cantwell, Maria [D-WA]—3/5/2007\*; Sen Cardin, Benjamin L. [D-MD]—4/18/2007; Sen Carper, Thomas R. [D-DE]—3/5/2007\*; Sen Chambliss, Saxby [R-GA]—3/7/2007; Sen Clinton, Hillary Rodham [D-NY]—3/5/2007\*; Sen Cochran, Thad [R-MS]—4/17/2007; Sen Coleman, Norm [R-MN]—3/5/2007\*; Sen Collins, Susan M. [R-ME]—3/14/2007; Sen Cornyn, John [R-TX]—3/5/2007\*; Sen Craig, Larry E. [R-ID]—3/5/2007\*; Sen Demenici, Pete V. [R-NM]—3/5/2007\*; Sen Durbin, Richard [D-IL]—3/6/2007; Sen Ensign, John [R-NV]—3/5/2007\*; Sen Enzi, Michael B. [R-WY]—3/5/2007\*; Sen Feinstein, Dianne [D-CA]—3/6/2007; Sen Hagel, Chuck [R-NE]—3/29/2007; Sen Hutchison, Kay Baily [R-TX]—3/5/2007\*; Sen Inouye, Daniel K. [D-HI]—3/5/2007\*; Sen Isakson, Johnny [R-GA]—3/29/2007; Sen Kennedy, Edward M. [D-MA]—3/5/2007\*; Sen Kerry, John F. [D-MA]—3/5/2007\*; Sen Klobuchar, Amy [D-MN]—3/14/2007; Sen Kohl, Herb [D-WI]—3/5/2007\*; Sen Landrieu, Mary L. [D-LA]—3/5/2007\*; Sen Lautenberg, Frank R. [D-NJ]—3/8/2007; Sen Levin, Carl [D-MI]—4/19/2007; Sen Lieberman, Joseph I. [ID-CT]—3/5/2007\*; Sen Lott, Trent [R-MS]—4/18/2007; Sen Lugar, Richard G. [R-IN]—3/5/2007\*; Sen Martinez, Mel [R-FL]—3/5/2007\*; Sen McCaskill, Claire [D-MO]—3/8/2007; Sen McConnell, Mitch [R-KY]—3/5/2007\*; Sen Menendez, Robert [D-NJ]—3/5/2007\*; Sen Mikulski, Barbara A. [D-MD]—3/5/2007\*; Sen Murkowski, Lisa [R-AK]—3/5/2007\*; Sen Nelson, Bill [D-FL]—3/5/2007\*; Sen Nelson, E. Benjamin [D-NE]—4/19/2007; Sen Obama, Barack [D-IL]—3/5/2007\*; Sen Pryor, Mark L. [D-AR]—3/5/2007\*; Sen Roberts, Pat [R-KS]—3/5/2007\*; Sen Rockefeller, John D., IV [D-WV]—3/5/2007\*; Sen Salazar, Ken [D-CO]—3/5/2007\*; Sen Smith, Gordon H. [R-OR]—3/5/2007\*; Sen Stabenow, Debbie [D-MI]—4/19/2007; Sen Stevens, Ted [R-AK]—3/5/2007\*; Sen Voinovich, George V. [R-OH]—3/5/2007\*; and Sen Warner, John [R-VA]—3/5/2007\*.

## EXHIBIT 4

THE AMERICA COMPETES ACT  
SECTION-BY-SECTION ANALYSIS

## Section 1. Short Title

Section 1 would provide that the legislation be cited as the “America COMPETES Act.”

Section 2. Organization of Act into Divisions;  
Table of Contents

Section 2 would organize the legislation into four divisions. Division A would contain sections related to commerce and science; Division B would contain sections related to the Department of Energy; Division C would contain sections related to education; Division D would contain sections related to the National Science Foundation. This section would also provide a Table of Contents for the legislation.

## DIVISION A—COMMERCE AND SCIENCE

## Section 1001. Short Title

This section would provide that this division may be cited as the “American Innovation and Competitiveness Act”

## TITLE I—OFFICE OF SCIENCE AND TECHNOLOGY POLICY; GOVERNMENTWIDE SCIENCE

## Section 1101. National Science and Technology Summit

This section would require the President to convene a National Science and Technology Summit within 180 days of enactment to evaluate the health and direction of nation’s science and technology enterprise and to identify key research and technology challenges and recommendations for research and development investment over the next five years as a result of the summit.

## Section 1102. Study on Barriers to Innovation

Section 1102 would require the Director of the Office of Science and Technology Policy to enter into a contract with the National Academy of Sciences to conduct a study to identify forms of risk that create barriers to innovation one year after enactment and four years after enactment. The study is intended to support research on the long-term value of innovation to the business community and to identify means to mitigate risks presently associated with such innovation activities.

## Section 1103. National Innovation Medal

Section 1103 amends Section 16 of the Stevenson-Wydler Technology Innovation Act of 1980 (15 U.S.C. 3711) to rename the “National

Technology Medal" as the "National Technology and Innovation Medal."

**Section 1104. Release of Scientific Research Results**

Section 1104 would require the Director of the Office of Science and Technology Policy (OSTP), in consultation with the Director of the Office of Management and Budget and the heads of all federal civilian agencies that conduct scientific research to develop and issue a set of principles for the communication of scientific information by government scientists, policy makers, and managers to the public within 90 days after the date of enactment of this Act. It is based upon recommendations from the National Science Board's review of the policies of federal science agencies concerning the suppression and distortion of research findings and their impact on the quality and credibility of all future government-sponsored scientific research results.

**Section 1105. Semiannual Science, Technology, Engineering, and Mathematics Days**

Section 1105 expresses a Sense of Congress that OSTP should encourage all elementary and middle schools to observe a Science, Technology, Engineering and Mathematics Day twice in every school year for the purpose of facilitating the interaction of science, technology, engineering, and mathematics mentors and grade school students. This section also expresses a Sense of Congress that OSTP should encourage involvement of federal employees, the private sector and institutions of higher learning in such days.

**Section 1106. Study on Service Science**

Section 1106 would express a Sense of Congress that the Federal Government should better understand and respond strategically to the emerging management and learning discipline known as, "service science."

Subsection (b) would require the Director of OSTP, through the National Academy of Sciences, to conduct a study on how the Federal Government should best support service science through research, education, and training.

**TITLE II—INNOVATION PROMOTION**

**Section 1201. President's Council on Innovation and Competitiveness**

Section 1201 requires the President to establish a President's Council on Innovation and Competitiveness to develop a comprehensive agenda to promote innovation in the public and private sectors. The Council, which could be constituted by designating an existing body to perform its functions, would include the Secretaries of Commerce, Defense, Education, Health and Human Services, Homeland Security, Labor, and Treasury along with the heads of the National Aeronautics and Space Administration, the Securities and Exchange Commission, the National Science Foundation, the Office of the United States Trade Representative, the Office of Management and Budget, the Office of Science and Technology Policy, the Environmental Protection Agency, and other relevant federal agencies involved in innovation. As the President's Council on Innovation and Competitiveness develops a comprehensive agenda for strengthening innovation and competitiveness it should the consult with advisors from the private sector, labor, scientific organizations, academic organizations, and other nongovernmental organizations working in the area of science or technology.

**Section 1202. Innovation Acceleration Research**

Section 1202 would require the President, through the head of each federal research agency, to establish the "Innovation Acceleration Research Program" to support and

promote innovation in the United States by requiring each department or agency that sponsors scientific research to set as a goal 8% of its annual research budget to be directed towards innovation acceleration research.

**TITLE III—NATIONAL AERONAUTICS AND SPACE ADMINISTRATION**

**Section 1301. NASA's Contribution to Innovation**

Section 1301 would direct that NASA be regarded as a full participant in interagency activities to promote competitiveness and innovation and to enhance science, technology, engineering and mathematics education. It would identify NASA's balanced science program as an essential part of NASA's contribution to innovation in and the economic competitiveness of the United States and that funding NASA at the levels authorized in the NASA Authorization Act of 2005 (P.L. 109-155) would enable NASA's programs to contribute to U.S. innovation and competitiveness.

**Section 1302. Aeronautics Institute for Research**

Section 1302 would consolidate NASA's aeronautics research authorized under the NASA Authorization Act of 2005 (P.L. 109-155) into an Aeronautics Institute for Research within NASA. Subsection (c) would require the Institute to cooperate with relevant programs in the Department of Transportation, the Department of Defense, the Department of Commerce, and the Department of Homeland Security, including the Joint Planning and Development Office established under the VISION 100-Century of Aviation Reauthorization Act (P.L. 108-176). The Aeronautics Institute would be allowed to accept assistance, staff, and funding from other federal departments and agencies.

**Section 1303. Basic Research Enhancement**

Section 1303 would establish, within NASA, a Basic Research Executive Council to oversee the distribution and management of programs and resources engaged in support of basic research activity including the most senior agency official representing the space science, earth science, life and microgravity sciences, and aeronautical research. The duties of the Council will be to set criteria for identification of basic research, set priority of research activity, review and evaluate research activity, make recommendations regarding needed adjustments in research activities, and provide annual reports to Congress on research activities.

**Section 1304. Aging Workforce Issues Program**

Section 1304 would express a Sense of Congress that the Administrator of NASA should implement a program to address aging workforce issues in aerospace that would (1) document technical and management experiences of senior NASA employees before they leave NASA; (2) provide incentives for retirees to return to NASA to teach new NASA employees about their lessons and experiences; (3) provide for the development of an award to recognize and reward senior NASA employees for their contributions to knowledge sharing.

**Section 1305. Conforming Amendments**

Section 1305 would amend Section 101(d) of the National Aeronautics and Space Administration Authorization Act of 2005 (42 U.S.C. 16611(d)) by adding that the assessment undertaken by NASA examine the number and content of science activities which may be considered as fundamental, or basic research, whether incorporated within specific missions or conducted independently of any specific mission. In addition, this section would require NASA to assess how NASA science activities can best be structured to ensure that basic and fundamental research can be

effectively maintained and coordinated in response to national goals in competitiveness and innovation.

**Section 1306. Fiscal Year 2008 Basic Science and Research Funding**

Section 1306 provides additional authorization, above the levels authorized in the National Aeronautics and Space Administration Act of 2005 (P.L. 109-155), of \$160 million for the funding of basic science and research for fiscal year 2008. The availability of these funds is made contingent upon unobligated balances being available to the NASA

**TITLE IV—NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY**

**Section 1401. Authorization of Appropriations**

Section 1401 would authorize appropriations for the National Institute of Standards and Technology (NIST) from Fiscal Year 2008 through Fiscal Year 2011, including authorizations for the Hollings Manufacturing Extension Partnership Program (MEP). The MEP authorizations would be taken from the authorizations provided for NIST. Authorization levels would be set as follows:

	FY 2008	FY 2009	FY 2010	FY 2011
NIST Total .....	\$703,611	\$773,972	\$851,369	\$936,506
MEP .....	\$115	\$120	\$125	\$130

All amounts are in millions.

**Section 1402. Amendments to the Stevenson-Wydler Technology Innovation Act of 1980**

Section 1402 would eliminate the Under Secretary of Commerce for Technology at the Department of Commerce and the related Technology Administration at the Department of Commerce.

**Section 1403. Innovation Acceleration**

Section 1403 would establish the Innovation Acceleration Research Program of Section 1202 at NIST, to be known as the "Standards and Technology Acceleration Research Program" to support and promote innovation in the United States through high-risk, high-reward research and set aside no less than 8 percent of the funds made available to the measurement laboratories at NIST each year for the program.

**Section 1404. Manufacturing Extension**

Section 1404 would amend Section 25(c)(5) of the National Institute of Standards and Technology Act (15 U.S.C. 278k(c)(5)) by inserting a probationary program for MEP centers that have not received a satisfactory rating. If the issues of a center are not addressed in one year, the Director would be required to conduct a competition to select a new operator for the center.

Subsection (b) would allow the acceptance of funds from other federal agencies and the private sector by the Secretary of Commerce and Director to strengthen U.S. manufacturing. Any private sector funding would not be considered a part of the federal share for the purpose of center cost-sharing. Funding accepted from other federal departments or agencies may be considered in the calculation of the federal share of capital and annual operating and maintenance costs under 15 U.S.C. 278k(c).

**Section 1405. Experimental Program to Stimulate Competitive Technology**

Section 1405 would re-establish the Experimental Program to Stimulate Competitive Technology (EPSCoT), previously managed by the Technology Administration, at NIST.

Subsection (d) would require that in making awards under this section, the Director of NIST shall ensure that the awards are awarded on a competitive basis that includes a review of the merits of the activities that are subject to the award. A special emphasis would be given to those projects which would increase the participation of women, Native

Americans (including Native Hawaiians and Alaska Natives), and other underrepresented groups in science and technology. Subsection (d)(2) would impose a matching requirement that not less than 50 percent of the cost of activities (other than planning activities) carried out by an EPSCoT award be funded by non-federal sources.

**Section 1406. Technical Amendments to the NIST Act and Other Technical Amendments**

Section 1406 would make several technical amendments to the NIST Act. Subsection (a) would lift the limitation on NIST-sponsored research fellowships under current law. Subsection (b) would clarify NIST's authority to issue grants and cooperative agreements, along with contracts, cooperative research and development agreements, and other appropriate instruments, bringing NIST authority into conformance with the Federal Grant and Cooperative Agreement Act (31 U.S.C. 6301-08). The subsection also would clarify NIST's authority to purchase memberships in scientific organizations and pay registration fees for NIST employees' attendance at conferences.

Subsection (c) would permit NIST to utilize a portion of its operating funds in the production of high priority Standard Reference Materials and ensure that, once recovered through sales, the working capital fund resources are available to maintain future supplies. In addition, this authority would permit funds transferred to NIST from other federal agencies for the production of Standard Reference Materials to be transferred to the fund.

Subsection (d) would update several measurements found in statute to be consistent with current practice and internationally recognized standards.

Subsection (e) would allow NIST to retain the depreciation surcharge that is assessed against all federal agencies and returned to the Treasury for the upkeep of public buildings.

Subsection (f) would strike NIST authority for the Non-Energy Inventions program. This program is no longer operated by NIST. Rather, it is now operated by the Department of Energy.

**TITLE V—OCEAN AND ATMOSPHERIC PROGRAMS**

**Section 1501. Ocean and Atmospheric Research and Development Program**

Section 1501 would require the Administrator of the National Oceanic and Atmospheric Administration (NOAA), in consultation with the Director of NSF and the Administrator of NASA, to establish a coordinated program of ocean and atmospheric research and development to promote United States leadership in ocean and atmospheric science.

**Section 1502. NOAA Ocean and Atmospheric Science Education Programs**

Section 1502 would require the Administrator of NOAA to conduct, develop, support, promote, and coordinate formal and informal educational activities at all levels to enhance public awareness and understanding of ocean, coastal, and atmospheric science and stewardship by the general public. In conducting those activities the administrator shall build upon the existing educational programs and activities of the agency.

Subsection (b) would require the Administrator of NOAA, appropriate NOAA programs, ocean and atmospheric science and education experts, and interested members of the public to develop a science education plan that would set forth education goals and strategies for NOAA, as well as programmatic actions to carry out such goals and priorities over the next 20 years. This plan would be reevaluated and updated every 5 years.

**DIVISION B—DEPARTMENT OF ENERGY**

*Section 2001. Short Title*

Section 2001 would specify that this Division may be referred to as the, "Protecting America's Competitive Edge Act through Energy (PACE-Energy) Act."

*Section 2002. Definitions*

Section 2002 would provide definitions for purposes of the Division.

*Section 2003. Mathematics, Science and Engineering Education at the Department of Energy*

Section 2003 would create a, "Director of Mathematics, Science and Engineering Education Programs" at the Department of Energy to coordinate all Mathematics, Science, and Engineering Education Department-wide. The Director would report to the Undersecretary of Science. Section 2003 would also amend the Department of Energy Science Education Enhancement Act to establish new programs in science, mathematics, and engineering education, including:

**Specialty Schools for Math and Science**—This portion of Section 2003 would create a competitive grant program to assist States in establishing or expanding public, statewide specialty schools that provide comprehensive mathematics, science, and engineering education. In addition, this portion of Section 2003 would authorize scientific and engineering staff of the National Laboratories to assist in teaching courses in statewide specialty schools in mathematics and science education, and to use National Laboratory scientific equipment in the teaching of courses. This portion of Section 2003 would authorize \$140 million over 4 years for these schools.

**Experiential-Based Learning Opportunities**—This portion of Section 2003 would establish summer internships, including internships at the National Laboratories, for middle and high school students to promote experiential, hands-on learning in math and science. This portion of Section 2003 would authorize \$15 million annually for this program from Fiscal Year 2008 through Fiscal Year 2011.

**National Laboratories Centers of Excellence in Mathematics and Science Education**—This portion of Section 2003 would establish a program at each of the National Laboratories to support a Center of Excellence in Mathematics and Science at one public secondary school located in the region of the national laboratory. This portion of Section 2003 would also require the Secretary to consider the performance of these Centers in determining the contract award fee for the management and operations contractor of each national laboratory.

**Summer Institutes**—This portion of Section 2003 would establish a program of summer institutes at each of the National Laboratories, and through grants to universities and other nonprofit entities, to strengthen the math and science teaching skills of K-12 teachers. This portion of Section 2003 would authorize \$190 million over 4 years for these institutes.

**Nuclear Science Education**—This portion of Section 2003 would create a program for competitive, merit-based grants to universities that establish or expand nuclear science and engineering degree programs. This portion of Section 2003 would authorize approximately \$140 million over 4 years for these grants.

*Section 2004. Department of Energy Early Career Research Grants*

Section 2004 would authorize research grants for early-career scientists and engineers pursuing innovative, independent research. Eligible individuals must have com-

pleted a doctorate within the previous 10 years, and must show promise in a field of science or technology. Grants awarded under this section would be for 5 years at a level of up to \$100,000 per year during the grant period. Section 2004 would authorize \$91 million over 4 years for this program.

*Section 2005. Advanced Research Projects Authority—Energy*

Section 2005 would establish the Advanced Research Projects Authority—Energy (ARPA-E) as a new agency within the Department of Energy. The mission of ARPA-E would be to support research with the potential to overcome long-term, high-risk technological barriers in the development of applied energy technologies (including carbon neutral technologies). The Director of ARPA-E would report to the Undersecretary of Science. An external advisory board would recommend to the Director, on an annual basis, key areas of energy research to include in the ARPA-E research portfolio.

*Section 2006. Authorization of Appropriations for the Department of Energy Office of Science*

Section 2006 would authorize a doubling of Office of Science funding over ten years. This rate of increase matches that in the President's American Competitiveness Initiative. The Fiscal Year 2008 request for the Office of Science was \$4.4 billion. The authorization is \$4.6 billion.

*Section 2007. Discovery Science and Engineering Innovation Institutes*

Section 2007 would establish multi-disciplinary institutes centered at National Laboratories to apply fundamental science and engineering discoveries to technological innovations related to the missions of the Department and the global competitiveness of the United States. Each Institute would be authorized to receive \$10 million in federal funding annually.

*Section 2008. PACE Graduate Fellowship Program*

Section 2008 would establish a competitive graduate fellowship program for up to 700 students pursuing doctoral degrees in mission areas of the Department. The section requires that students be selected for the fellowship program through a competitive merit review process (involving written and oral interviews) that will result in a wide distribution of awards throughout the United States. This section would authorize \$93 million over 4 years for these fellowships.

*Section 2009. Title IX Compliance*

Section 2009 would require the Department of Energy to conduct compliance reviews of two grant recipients to determine compliance with the provisions of Title IX of the Education Amendments of 1972. Title IX of the Education Amendments of 1972 required government agencies to ensure that female students had equal access to the programs supported by federal grants.

*Section 2010. High-Risk, High-Reward Research*

Section 2010 would require the Secretary of Energy to establish a grant program to encourage the conduct of high-risk, high-reward research at the Department of Energy.

*Section 2011. Distinguished Scientists Program*

Section 2011 would establish a joint program between universities and national laboratories to support up to 100 distinguished scientists positions. These scientists would hold joint appointments at the labs and their universities, and would promote academic and scientific excellence cooperation between the two institutions. Section 2011 would authorize \$290 million over 4 years for these appointments.

**DIVISION C—EDUCATION****Section 3001. Findings**

Section 3001 presents findings that the United States needs to build on and expand the impact of existing education programs that work to ensure a well-educated populace to remain competitive in the global economy.

**Section 3002. Definitions**

Section 3002 contains definitions that are used throughout the Education Division.

**TITLE I—TEACHER ASSISTANCE**  
**SUBTITLE A—TEACHERS FOR A COMPETITIVE TOMORROW**

**Section 3111. Purpose**

Section 3111 would provide that the purpose of this subtitle is to develop and implement undergraduate programs leading to a baccalaureate degree with concurrent teacher certification that provide integrated courses of study in mathematics, science, engineering, or critical foreign languages and teacher education, and master's degree programs in mathematics, science, or critical foreign language education for current teachers to enhance their content knowledge and pedagogical skills.

**Section 3112. Definitions**

Section 3112 contains definitions that are used in this subtitle.

Section 3113. Programs for Baccalaureate Degrees in Mathematics, Science, Engineering, or Critical Foreign Languages, with Concurrent Teacher Certification.

Section 3113 would authorize competitive grants for partnerships to develop and implement programs that integrate programs of study for undergraduate students majoring in mathematics, engineering, science or a critical foreign language with teacher education, so that students can obtain baccalaureate degrees with concurrent teacher certification. These partnerships would consist of institutions of higher education, departments of mathematics, engineering, science or critical foreign languages, teacher preparation programs and high-need local educational agencies and their schools.

**Section 3114. Programs for Master's Degrees in Mathematics, Science, or Critical Foreign Languages Education**

Section 3114 would authorize competitive grants for partnerships to develop and implement 2- or 3-year part-time master's degree programs in mathematics, science, or critical foreign language education for current teachers to improve their content knowledge and pedagogical skills. These partnerships would consist of institutions of higher education, departments of mathematics, engineering, science or critical foreign languages, teacher preparation programs and high-need local educational agencies and their schools.

**Section 3115. General Provisions**

Section 3115 contains provisions that would be applicable to both the baccalaureate and master's degree programs. Under both programs, grants would be for five years; matching funds would be required; and grant funds could be used only to supplement, not supplant, other Federal or State funds. The Secretary would be required to evaluate the programs and provide an annual report to Congress.

**Section 3116. Authorization of Appropriations**

Section 3116 would authorize to be appropriated a total for both programs of \$210,000,000 for Fiscal Year 2008, and such sums as may be necessary for each of the three succeeding fiscal years, and specify the proportion of the total funding that is to be spent carrying out each of the two programs.

**SUBTITLE B—ADVANCED PLACEMENT AND INTERNATIONAL BACCALAUREATE PROGRAMS****Section 3121. Purpose**

Section 3121 would provide that the purpose of this subtitle is to raise academic achievement through Advanced Placement (AP) and International Baccalaureate (IB) programs by increasing the number of teachers serving high-need schools who are qualified to teach AP or IB courses in mathematics, science, and critical foreign languages; increasing the availability of such courses in high-need schools, including courses that prepare students to enroll and succeed in AP and IB; and increasing the number of students attending high-need schools who take such courses and take and pass the examinations.

**Section 3122. Definitions**

Section 3121 contains definitions that are used in this subtitle.

**Section 3123. Advanced Placement and International Baccalaureate Programs**

Section 3123 would authorize competitive grants to achieve the purposes of this subtitle and would authorize to be appropriated \$58,000,000 for Fiscal Year 2008, and such sums as may be necessary for each of the three succeeding fiscal years.

**TITLE II—MATH NOW****Section 3201. Math Now for Elementary School and Middle School Students Program**

Section 3201 would authorize a grant program to improve instruction in mathematics for elementary school and middle school students, and to provide targeted help to students struggling with mathematics, to enable all students to reach or exceed grade-level academic achievement standards. Grants would be awarded to implement mathematics instructional materials and interventions, provide professional development activities, and conduct continuous progress monitoring of students in mathematics. State educational agencies would be awarded grants on a competitive basis to enable them to award grants to eligible local educational agencies. Priority would be given to applications for projects that would implement statewide strategies for improving mathematics instruction and raising the mathematics achievement of students, particularly those in grades 4 through 8. There would be a matching requirement, but the Secretary would have the authority to waive all or part of it in cases of serious hardship. The section would authorize to be appropriated \$146,700,000 for Fiscal Year 2008, and such sums as may be necessary for each of the 3 succeeding fiscal years.

**TITLE III—FOREIGN LANGUAGE PARTNERSHIP PROGRAM****Section 3301. Findings and Purpose**

Section 3301 presents findings that the United States faces a shortage of skilled professionals with higher levels of proficiency in foreign language and that the ability of students to become proficient can be addressed by starting language learning at a younger age and expanding opportunities for continuous foreign language education from elementary school through postsecondary education. The purpose of this title is to increase significantly both the opportunities to study critical foreign languages programs and the number of students who become proficient in critical foreign languages.

**Section 3302. Definitions**

Section 3302 contains definitions that are used in this title.

**Section 3303. Program Authorized**

Section 3303 would authorize a competitive grant program to enable institutions of high-

er education and local educational agencies working in partnership to establish articulated programs of study in critical foreign languages so that students from elementary school through postsecondary education can advance their knowledge successfully and achieve higher levels of proficiency in a critical foreign language.

**Section 3304. Authorization of Appropriations**

Section 3304 would authorize to be appropriated \$22,000,000 for Fiscal Year 2008, and such sums as may be necessary for each of the three succeeding fiscal years.

**TITLE IV—ALIGNMENT OF EDUCATION PROGRAMS****Section 3401. Alignment of Secondary School Graduation Requirements with the Demands of 21st Century Postsecondary Endeavors and Support for P-16 Education Data Systems**

Section 3401 would provide that this title would authorize competitive grants to States to promote better alignment of elementary and secondary education with the knowledge and skills needed to succeed in academic credit-bearing coursework in institutions of higher education, in the 21st century workforce and in the Armed Forces. The title would also authorize competitive grants to support the establishment or improvement of statewide P-16 education longitudinal data systems to assist States in improving the rigor and quality of content knowledge requirements and assessments, ensure that students are prepared to succeed in postsecondary endeavors, and enable States to have valid and reliable information to inform education policy and practice. The section would authorize to be appropriated \$100,000,000 for Fiscal Year 2008, and such sums as may be necessary for Fiscal Year 2009.

**DIVISION D—NATIONAL SCIENCE FOUNDATION****Section 4001. Authorization of Appropriations**

Subsection (a) would authorize appropriations for the National Science Foundation (NSF) at the following levels for 4 years.

	FY 2008	FY 2009	FY 2010	FY 2011
NSF .....	\$6,808	\$7,433	\$8,446	\$11,200

All amounts are in \$ billion.

Subsection (b) would require the Director of NSF to create a plan for spending this increased funding within 180 days of enactment, taking into account the priorities established by the Science Summit authorized under Section 101(c) of this Act.

**Section 4002. Strengthening of Education and Human Resources Directorate through Equitable Distribution of New Funds**

Section 4002 would provide for annual funding increases for the education and human resources programs of the National Science Foundation to ensure the continued involvement of experts at the National Science Foundation in improving science, technology, engineering and mathematics education at the elementary, secondary and postsecondary level. As appropriations for the National Science Foundation increase, funds for the education and human resources programs would increase by a proportional amount.

**Section 4003. Graduate Fellowships and Graduate Traineeships**

Section 4003 would require the Director of NSF to expand both the Graduate Research Fellowship Program and the Integrative Graduate Education and Research Traineeship Program for an additional 1,250 students each over the next 5 years. Within the amounts authorized under Section 4001,

this section would authorize appropriations at the following levels in Fiscal Years 2008 through 2011 to support the expansion of the Graduate Research Fellowship Program (GRF) and the Integrative Graduate Education and Research Traineeship Program (IGERT).

	FY 2008	FY 2009	FY 2010	FY 2011
GRF .....	\$24	\$36	\$48	\$60
IGERT .....	\$22	\$33	\$44	\$55

All amounts are in \$ million.

**Section 4004. Professional Science Master's Degree Programs**

Section 4004 would require the Director of NSF to establish an NSF clearinghouse to share program elements used in professional science master's degree (PSMD) programs and other advanced degree programs related to science, mathematics, technology, and engineering, to help institutions of higher education establish professional science master's programs. The clearinghouse would be established in conjunction with 4-year institutions of higher education, graduate schools, industry, and federal agencies.

Subsection (b) would require the Director to award grants to 4-year institutions of higher education to facilitate the institutions' creation or improvement of professional science master's degrees programs. The program would make awards to a maximum of 200 4-year institutions of higher institutions for a 3 year period. Any grant renewals would be for a maximum of 2 additional years. The Director would be required to give preference in making awards to 4-year institutions of higher education seeking federal funding to support pilot professional science master's degree programs to applicants that secure more than 3% of their funding for such professional science masters degree programs from sources other than the Federal Government.

Within the amounts authorized under Section 4001, Subsection (d) would authorize appropriations at the following levels in Fiscal Years 2008 through 2011 to carry out this section.

	FY 2008	FY 2009	FY 2010	FY 2011
PSMD .....	\$15	\$18	\$20	\$20

All amounts are in \$ million.

**Section 4005. Increased Support for Science Education through the National Science Foundation**

Within the amounts authorized under Section 4001, Section 4005 would authorize appropriations for the science, mathematics, engineering, and technology talent program established in section 8(7) of the National Science Foundation Act of 2002 (P.L. 107-368) at the following levels in Fiscal Years 2008 through 2011.

	FY 2008	FY 2009	FY 2010	2011
Tech Talent .....	\$40	\$45	\$50	\$55

All amounts are in \$ million.

**Section 4006. Meeting Critical National Science Needs**

Section 4006, subsection (a) would require the Director of NSF to include consideration of the degree to which NSF awards and research activities assist in meeting critical national needs in innovation, competitiveness, the physical and natural sciences, technology, engineering, and mathematics.

Subsection (b) would require the Director of NSF to give priority in the selection of awards and the allocation of NSF resources under the Research and Related Activities budgetary account to those projects that can be expected to make contributions in phys-

ical and natural sciences, technology, engineering, and mathematics, or which can be expected to enhance competitiveness or innovation in the United States.

Subsection (c) would clarify that the priority consideration required by Section 4006 does not restrict or bias the grant selection process against other areas of research consistent with the mandate of the Foundation.

**Section 4007. Reaffirmation of the Merit-Review Process of the National Science Foundation**

Section 4007 would clarify that nothing in this Act shall be interpreted to require or recommend that NSF change its (1) merit-review system or (2) peer review process. These processes should continue to be used in determining what grants NSF will fund.

**Section 4008. Experimental Program to Stimulate Competitive Research**

Section 4008 would authorize the NSF's Experimental Program to Stimulate Competitive Research (EPSCoR) at \$125 million for Fiscal Year 2008, of the funds authorized in Section 4001, increasing each year from Fiscal Year 2009 to Fiscal Year 2011 by the same percentage by which NSF's overall funding increases.

**Section 4009. Encouraging Participation**

Subsection (a) would require the Director of NSF to establish a program to provide mentors for women who are interested in careers in science, technology, engineering, and mathematics by paring such women with mentors who are working in industry.

Subsection (b) would require the Director of NSF to establish a program to provide grants to community colleges to provide apprenticeships and other appropriate training to allow women to enter higher-paying technical jobs in fields related to science, technology, engineering, or mathematics.

Subsections (c) and (d) establish the requirements for application and the evaluation criteria of this program.

**Section 4010. Cyberinfrastructure**

Section 4010 would require the Director of NSF to develop and publish a plan that describes the current status of broadband access for scientific research purposes in EPSCoR-eligible jurisdictions and outlines actions that could be taken to ensure that broadband connections are available to enable participation in NSF programs that rely heavily on highspeed networking and collaborations across institutions and regions.

**Section 4011. Federal Information and Communications Technology Research**

Section 4011 would require the Director of NSF to establish a grant program for basic research in advanced information and communications technologies focused on enhancing or facilitating the availability and affordability of advanced communications services to all Americans. In developing this program, the Director shall consult with a Federal Advanced Information and Communications Technology Research Board composed of individuals with expertise in information and communications technologies, including representatives from the National Telecommunications and Information Administration, the Federal Communications Commission, the NIST, the Department of Defense, and representatives from industry and educational institutions. Within the amounts authorized by Section 4001, Section 4011 would authorize appropriations to carry out this section at the following levels in Fiscal Years 2008 through 2011.

	FY 2008	FY 2009	FY 2010	FY 2011
Telecommunications .....	\$45	\$50	\$55	\$60

All amounts are in \$ million.

**Section 4012. Robert Noyce Teacher Scholarship Program**

Section 4012 would increase support for the Robert Noyce Scholarship Program to recruit and train individuals to become math and science teachers in high need local educational agencies. It would increase the undergraduate scholarship amount from \$7,500 to \$10,000 per year for a maximum of two years (in exchange for teaching service) and add a summer internship component for freshmen and sophomores interested in the program. Provisions that require repayment of scholarship or stipend by recipients who do not complete their service requirement would be amended to require repayment through a federal student loan with terms consistent with provisions in parts B and D of title IV of the Higher Education Act. Within the amounts authorized by Section 4001, Section 4012 would authorize appropriations to carry out this section at the following levels in Fiscal Years 2008 through 2011

	FY 2008	FY 2009	FY 2010	FY 2011
Noyce Program .....	\$117	\$130	\$148	\$200

All amounts are in \$ million.

**Section 4013. Sense of the Senate Regarding the Mathematics and Science Partnership Programs of the Department of Education and The National Science Foundation**

Section 4013 would provide a sense of the Senate that mathematics and science partnership programs operated by the Department of Education and the National Science Foundation are complementary not duplicative, and the two agencies should have ongoing collaboration to ensure the two components continue to work in concert.

**Section 4014. National Science Foundation Teacher Institutes for the 21st Century**

Section 4014 would specifically authorize and increase support for the Teacher Institutes for the 21st Century summer institute program at the National Science Foundation to provide cutting-edge professional development for elementary and secondary school math and science teachers who teach in high need schools. It would provide for follow-up training and support during the academic year for participating teachers. Within the amounts authorized by Section 4001, Section 4014 would authorize appropriations to carry out this section at the following levels in Fiscal Years 2008 through 2011.

	FY 2008	FY 2009	FY 2010	FY 2011
Teacher Institutes .....	\$84	\$94	\$106	\$140

All amounts are in \$ million.

Mr. ALEXANDER. Mr. President, I see no other Senator on the floor and suggest the absence of a quorum.

The ACTING PRESIDENT pro tempore. The clerk will call the roll.

The bill clerk proceeded to call the roll.

The ACTING PRESIDENT pro tempore. The majority leader is recognized.

Mr. REID. Mr. President, I ask unanimous consent that the order for the quorum call be rescinded.

The ACTING PRESIDENT pro tempore. Without objection, it is so ordered.

**MOMENT OF SILENCE FOR THE VICTIMS AND FAMILIES OF THE TRAGEDY AT VIRGINIA TECH**

Mr. REID. Mr. President, yesterday I spoke to Governor Kaine, Tim Kaine,