March 18, 2005

Re: Funding for Mathematics and Science Partnerships in NSF

Dear Colleague,

We ask you to join us in writing to the Senate Appropriations Subcommittee on Commerce, Justice, and Science to express our strong support for mathematics and science education and to urge them to fund the NSF Mathematics and Science Partnership Program at a level that will permit the Foundation to continue to develop new and innovative approaches to math and science education.

Talented math and science students are missing real opportunities, to our nation’s detriment. Internationally, we are below average. Many of us agree that improving math and science education must be a national priority.

As noted in the attached letter, the NSF program is a key part of a strategy for improving math and science education, and there are signs that it is working. But neither current funding nor the funding level in the FY2006 Budget are sufficient to establish any new partnerships.

Additional information on the NSF Math Science Partnership Program can be found on the attached information sheet, “Early NSF Math & Science Partnership Results are Encouraging, But It’s Just a Start.”

If you wish to sign the letter or have questions, please contact one of the following by April 12:

Gordon Day, 4-0822, gordon_day@rockefeller.senate.gov
Lauri Hettinger, 4-5641, lauri_hettinger@coleman.senate.gov
Mickie Flores, 4-3847, mickie_flores@durbin.senate.gov

Sincerely,

John D. Rockefeller, IV          Norm Coleman        Richard J. Durbin
March_, 2005

The Honorable Richard C. Shelby, Chair  
The Honorable Barbara A. Mikulski, Ranking Member  
Subcommittee on Commerce, Justice, and Science  
Senate Committee on Appropriations  
Washington, DC 20510

Dear Chairman Shelby and Senator Mikulski:

We urge you to fund the National Science Foundation’s Mathematics and Science Education Partnerships for FY2006 at not less than $200 million dollars. This program was established as part of Public Law 107-368, the National Science Foundation Authorization Act of 2002. It enables the Foundation to fulfill its mission to advance the teaching of science and mathematics in our schools, by offering grants to partnerships between K-12 and university educators for the development of new and innovative approaches. The outcomes of the NSF program also enhance K-12 mathematics and science education programs in the Department of Education, which can draw upon the results of NSF-sponsored research.

If the United States is to remain at the forefront of a global high-technology economy, it must have a technically trained workforce. If we are to extend the length and enhance the quality of life of Americans, we must have trained medical scientists and practitioners. To succeed in these and many other critical fields, we must interest our young people in scientific professions, and provide them with the basic skills they need to excel. Sadly, in recent decades we have not been doing these things well.

In the latest (2003) study by the Organization for Economic Co-operation and Development (OECD), 15-year-old students in the United States ranked 24th in mathematics and 19th in science among 29 member countries. The performance of our students worsens as they move through the K-12 years; gender, race, and ethnicity are important factors in the decline. According to the Department of Education’s National Assessment of Educational Progress (NAEP), 35% of our White eighth grade students achieve “proficient level” in mathematics, but only 6% of African American and 10% of Hispanic students achieve that level. These studies also show that, among White and Hispanic students, males perform much better than females. Analyses of SAT mathematics scores, across all groups, show that males outscore females by an average of about 40 points. Clearly, research to improve teaching for minorities and girls is badly needed.

The innovative programs enabled by the NSF Mathematics and Science Education Partnerships program are conceived and developed in partnerships between institutions of higher education and local, K-12, educational agencies. Very importantly, because it is
part of NSF, the program is administered with the same attention to quality, peer review, and evaluation that the Foundation applies to all of its programs. It therefore draws proposals from the most talented and creative educators. Through the evaluations, successful projects provide guidance on how to promote quality math and science education broadly.

The 48 partnerships funded to date will reach over 140,000 teachers of mathematics and science and directly impact over 4.25 million students. The list of partners includes approximately 150 institutions of higher education and many corporations and businesses.

Though the program is only a few years old, success stories are accumulating. In the school districts served by a partnership in El Paso, TX, three quarters of all students are now enrolled in college preparatory math and science classes. Pass rates in all participating classes are at historic highs, and some have increased dramatically. In another partnership, involving two major universities and four urban school districts scattered across the country, the test scores of students who participated in a partnership-developed pilot study increased by twice as much as their peers, and the differential among African-American students was eight-fold.

Because of reduced funding, no new partnerships will be started in FY2005, and, without the funding we are requesting here, no new partnerships will be formed in FY2006. We believe that this would be a tragic loss.

Effective early math and science education is essential for our future. It must be improved, nationally, and we must resolve the disparities by gender, race, and ethnicity. The NSF Mathematics and Science Education program is an essential part of a national strategy to do that. Please provide it with the funding it needs.

Sincerely,
Early NSF Math & Science Partnership Results are Encouraging
But It’s Just a Start

“The rapid pace of technological change and the globalization of the economy, simply demand that our workforce be literate in science and math. Now, and for the foreseeable future, it is a simple fact that work will migrate to the nation with the most skilled workforce. Moreover, our national security depends on having access to a workforce that has highly advanced technical skills.”

--Former Energy Secretary Spence Abraham, 07/08/04

A Grim Reality
✓ According to the Program for International Student Assessment (PISA), conducted by the OECD, U.S. 15 year-olds ranked 24th out of 29 industrialized nations in both mathematical literacy and in problem-solving abilities.

✓ On the 2002 National Assessment of Educational Progress (NAEP) Math Assessment, 35% of all 12th graders scored “Below Basic.” The results were much worse for some minority populations.

The solution is urgent
No Child Left Behind requires that students be assessed in science beginning in the 2007-2008 school year.

The Road to Improvement
The National Science Foundation’s Math & Science Partnership program is a critically important R&D effort that integrates the work of higher education with K-12 educators, to strengthen and reform math and science education. The MSP goal is to improve student outcomes in math and science for all K-12 students.

Between 2002 and 2004, through a series of competitions involving extensive merit reviews, 48 Partnership projects were started across the nation. Collectively, they bring together about 150 institutions of higher education and about 450 K-12 school districts, as well as corporate partners.

The designs of Partnership projects draw upon the latest education research. The outcomes of Partnership projects make evidence-based contributions to the knowledge base. Project evaluations conducted by NSF enable research findings and successful strategies to be broadly disseminated to improve educational practice.

The NSF Math Science Partnership works in collaboration with the Department of Education’s Math Science Partnership Program, which provides formula-based grants for mathematics and science education. Defined linkages assure that the two programs are managed for maximum joint effectiveness.

Milestones – Recent Reports of Success
In St. Clair, MI, teachers found that when they applied curriculum standards similar to those used in high achieving countries, using existing American textbooks, scores of the experimental groups significantly exceeded those of control groups. The experimental group’s math scores were also significantly higher than the international mean scores in the most recent Trends in International Mathematics & Science Study (TIMSS). The control group matched the U.S. mean, which is below the international mean.

Aligned Immersion Units were created by a partnership among the University of Wisconsin-Madison, the University of Pittsburgh, and four urban school districts (Denver, Los Angeles, Providence and Madison). These are extended, guided, and rigorous investigations of science-math topics that require students to pose their own questions, do research, and design an experiment to answer their questions. The experimental groups achieved twice the pre-post gains in test scores as did contrast groups. Scores for African-American students were eight times higher.

Where Do We Go Next? Our Research Needs
There is much yet to be discovered. We lack sufficient research in the cognitive foundations of mathematics and science learning. As states work to increase teacher qualifications and student achievement, they look to the research community for 1) effective learning interventions, 2) successful models for teacher training, 3) technologies to advance learning, 4) key competencies necessary for a technologically literate workforce, 5) new organizational models and instructional policies, and 6) valid and reliable assessments for teacher and student knowledge, particularly in science. The NSF MSP program addresses these research issues.

Funding Future
Budget limitations precluded new starts in FY2005 and the FY2006 budget request would not permit any new starts in FY2006. We are seeking $200 million for FY2006.